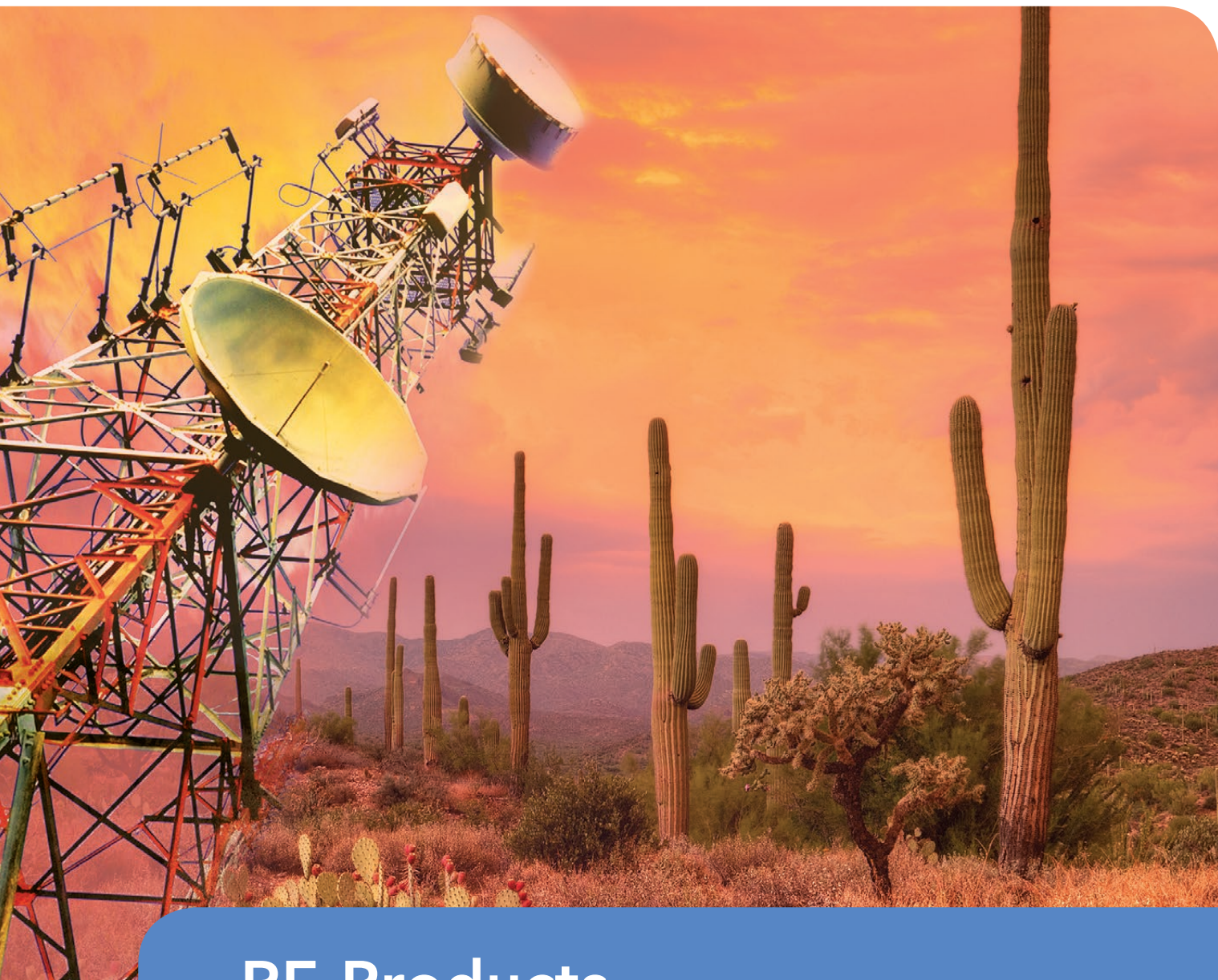




RF Products

Selection Guide



RF Product Selector Guide

The global leader in RF innovation and technology for more than 60 years, NXP offers RF power transistors for communication and industrial applications serving these markets:

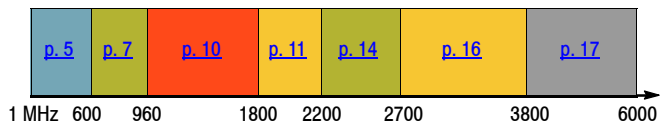
- wireless infrastructure
- industrial, scientific, medical (ISM) and broadcast
- 2-way radio
- aerospace and defense
- cooking
- low power

With products ranging from 1.8 mW to 1.5 kW and from DC to 6000 MHz, using LDMOS and GaN as well as GaAs and SiGe technologies, NXP offers the broadest portfolio of RF power transistors.

How to Use This Selector Guide

Download this selector guide's PDF file (SG46 R43) from www.nxp.com/RFSelectorGuide.

Using the color bar below, click the frequency band of your choice to view our list of recommended RF power transistors.



Using the RF Power Product Portfolio graphical representation that begins on p. 5, choose a part with the desired output power and frequency, and click that product's corresponding page number to be taken to parametric information for that part.

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Access Data On-Line

Available online are part number search, the product library, documentation library, software and tools library, application sites, product sites, sales and support, training and where to buy at the following URL:
<http://www.nxp.com>.

See the RF Design Resources at
<http://www.nxp.com/RFpower> and
<http://www.nxp.com/RFlowpower> for specific RF product support information for:

- Data sheets
- Applications notes
- Selector guide
- Packaging information
- Application information
- Models
- MTTF calculators
- .s2p Files
- Events
- RF Product Selector

Design Tools and Data Available On-Line for Your Design-in Process

RF High Power Models

NXP continues to populate its RF High Power Model Library with FET², MET and Root models. All product models available in the RF High Power Model Library (FET², MET and Root) include package, bond wire and internal matching network effects.

The FET² and MET models for RF High Power transistors and RF ICs are nonlinear models that examine both electrical and thermal phenomena and can account for dynamic self-heating effects of device performance. They are specifically tailored to model high power RF transistors and RF ICs used in wireless base station applications.

Implemented in the Keysight Advanced Design System and AWR Microwave Office®, the FET² and MET models are capable of performing small-signal, large-signal, harmonic- balance, noise and transient simulations. Because of their ability to simulate self-heating effects, the FET² and MET models are more accurate than existing models, enabling circuit designers to predict prototype performance more accurately and reduce design cycle time.

The current release of the FET² and MET models are available for these tools:

- Agilent EEsof ADS nonlinear circuit simulator
- AWR Microwave Office

The RF High Power Model Library is available for all major computer platforms supported by these simulators.

For more information and latest releases supported, go to <http://www.nxp.com/RF/models>.

RF Power Electromigration MTTF Calculation Program

Program Functionality

This MTTF/FIT calculator software is designed to assist our customers in estimating the LDMOS device reliability in terms of electromigration wear-out failures. The program evaluates LDMOS device Mean-Time-To-Failure (MTTF) using Black's Equations. It also estimates the Failures-in-Time (FIT) value at the expected base transceiver system (BTS) life span.

About the Program

This program is designed for estimating LDMOS device electromigration failure rate. According to electromigration theory, there are two wear-out modes for silicon components employing aluminum as a metallization material:

- The formation of an electrically open circuit due to the condensation of vacancies in the aluminum to form voids.
- The growth of etch-pits into silicon by the dissolution of silicon into aluminum (to short out an underlying junction).

The program also estimates the FIT value at the expected base BTS life span. The calculation requires input for the drain voltage, drain currents, case temperature, RF input/output power and expected BTS life.

MTTF Calculator Availability

RF Power MTTF calculators are being added to the NXP web site for all RF Power LDMOS discrete transistor and IC devices. MTTF calculators are available at <http://www.nxp.com/RF/calculators>.

RF Power Product Portfolio

Choose the output power and frequency range needed to meet the design requirements for your end application.

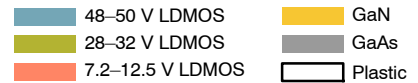
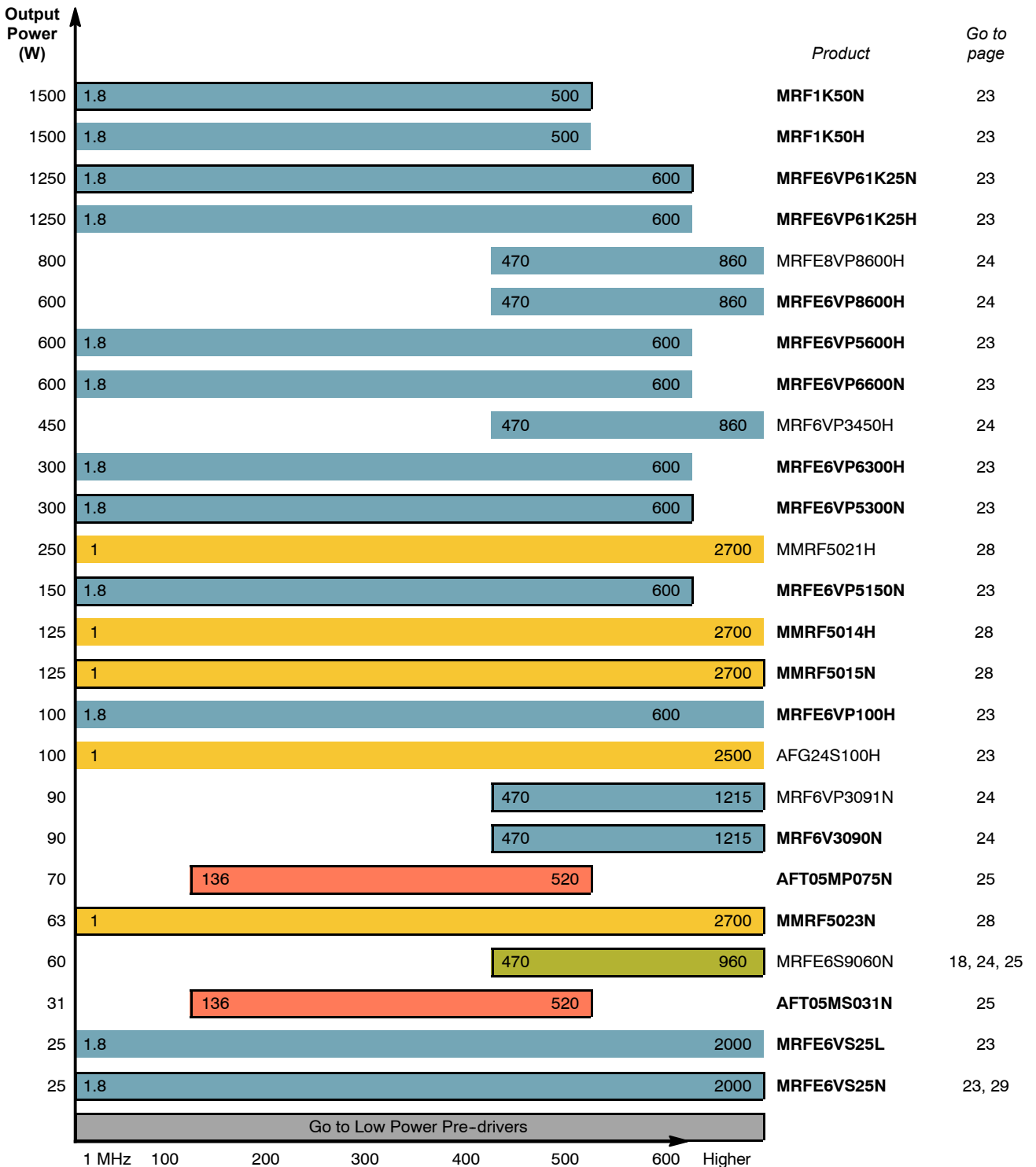


Table 1. RF Power Products — 1–600 MHz

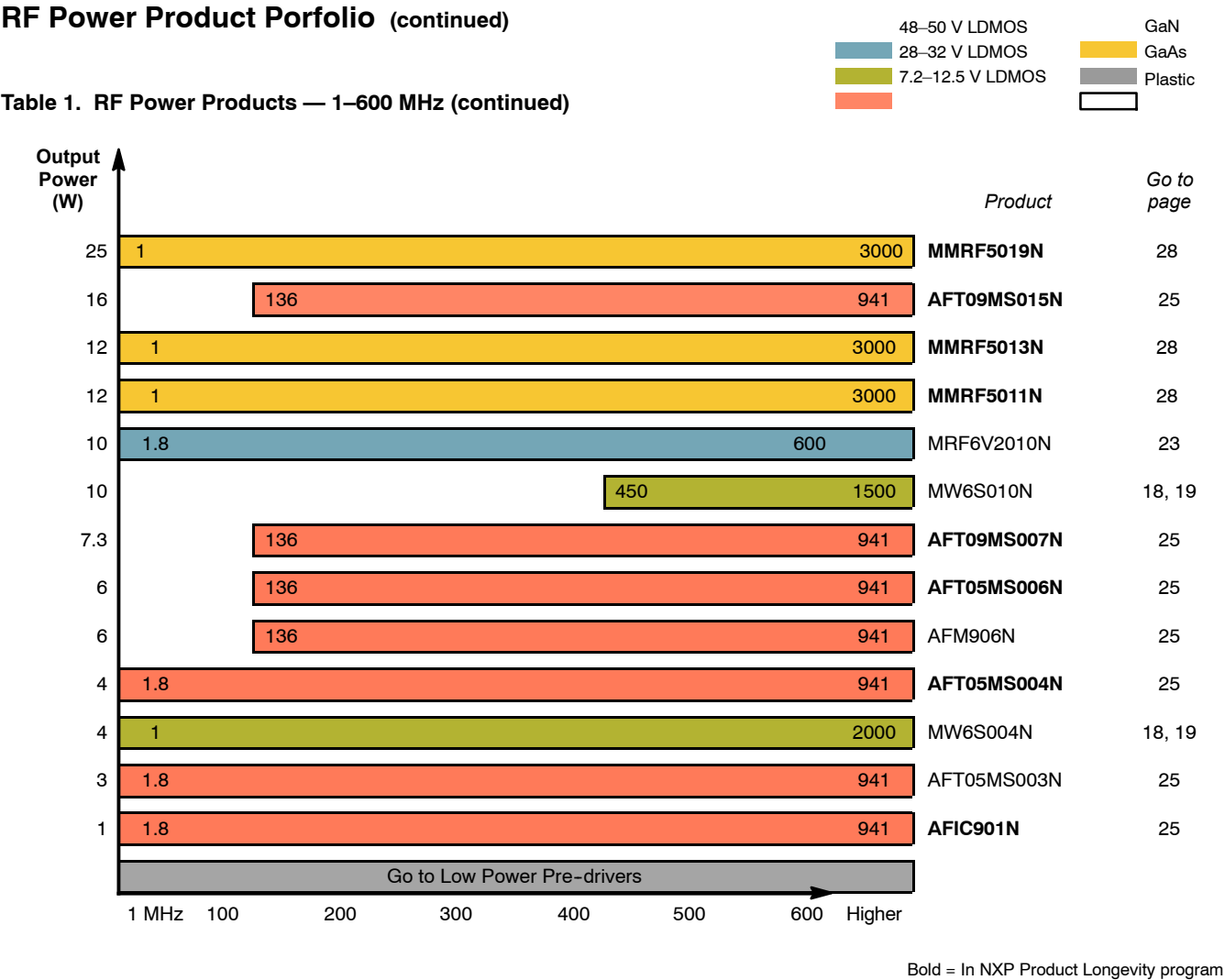


(continued)

Bold = In NXP Product Longevity program

RF Power Product Porfolio (continued)

Table 1. RF Power Products — 1–600 MHz (continued)



RF Power Product Portfolio (continued)

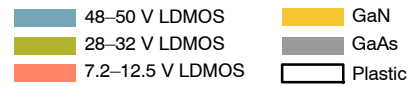
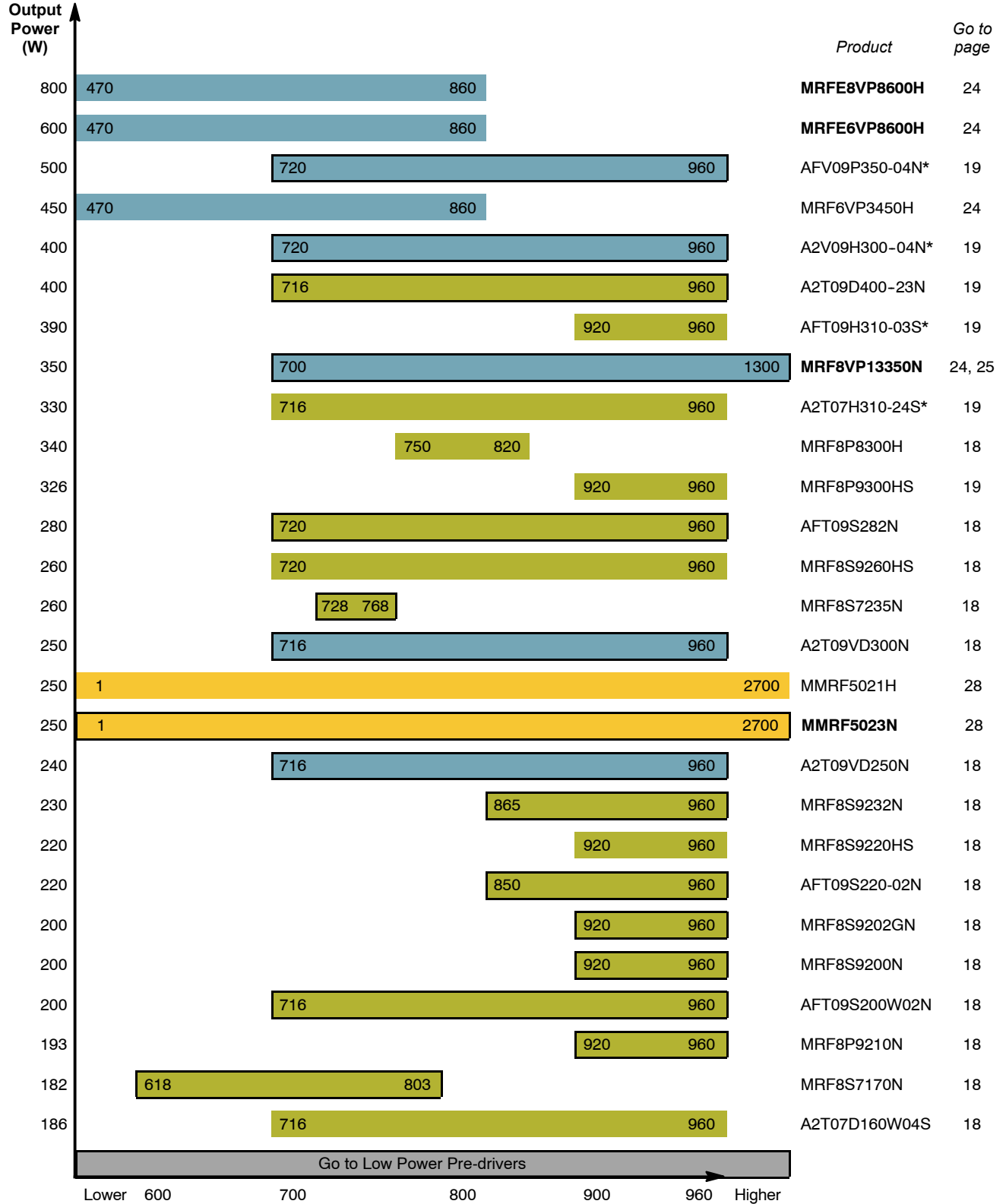


Table 2. RF Power Products — 600–960 MHz



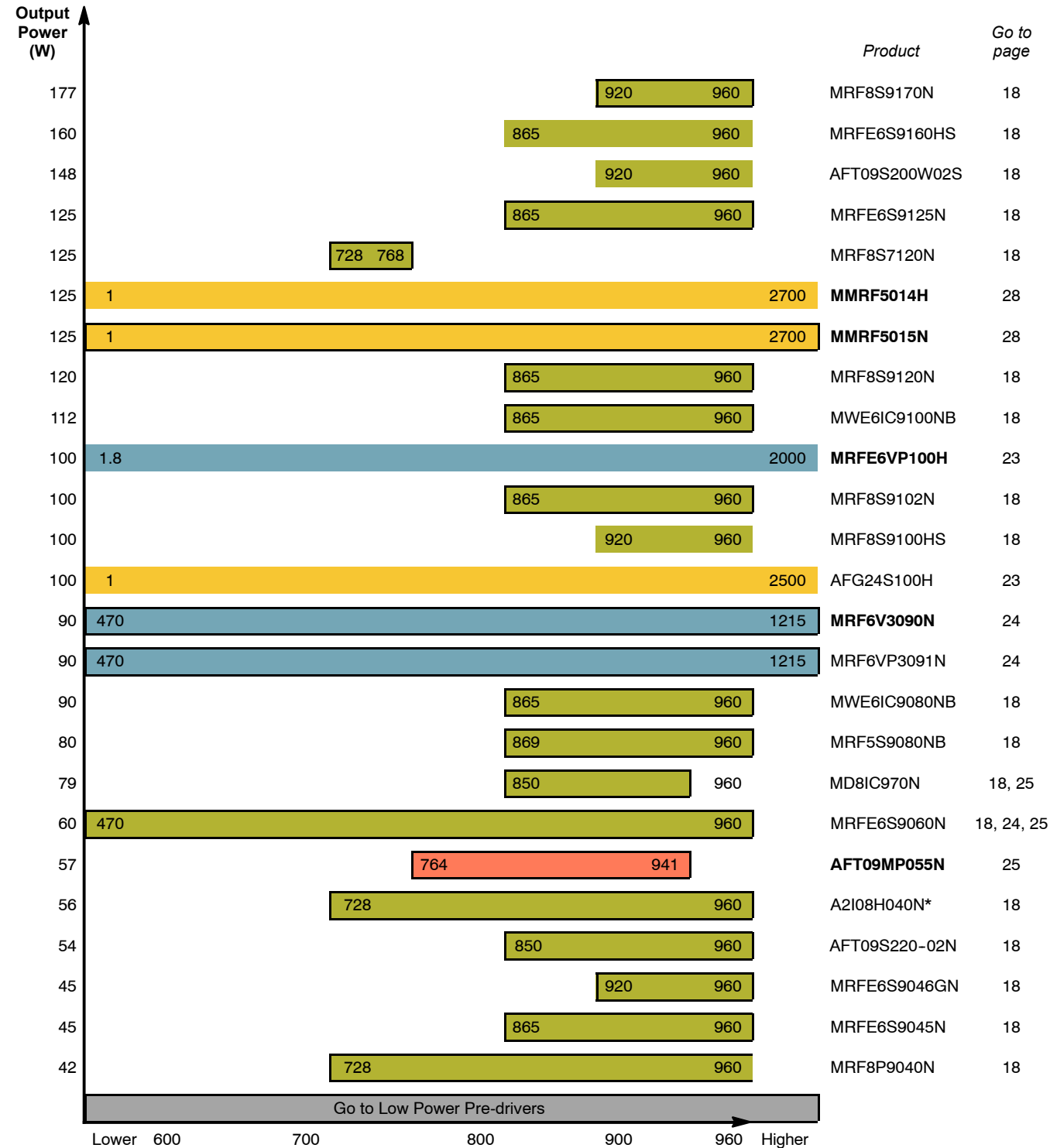
(continued)

Bold = In NXP Product Longevity program
* Output Power measured at P3dB

RF Power Product Portfolio (continued)

Table 2. RF Power Products — 600–960 MHz (continued)

48–50 V LDMOS GaN
28–32 V LDMOS GaAs
7.2–12.5 V LDMOS Plastic



(continued)

Bold = In NXP Product Longevity program
*Output Power measured at P3dB

RF Power Product Portfolio (continued)

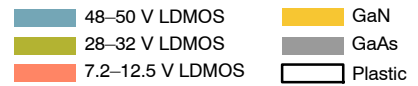
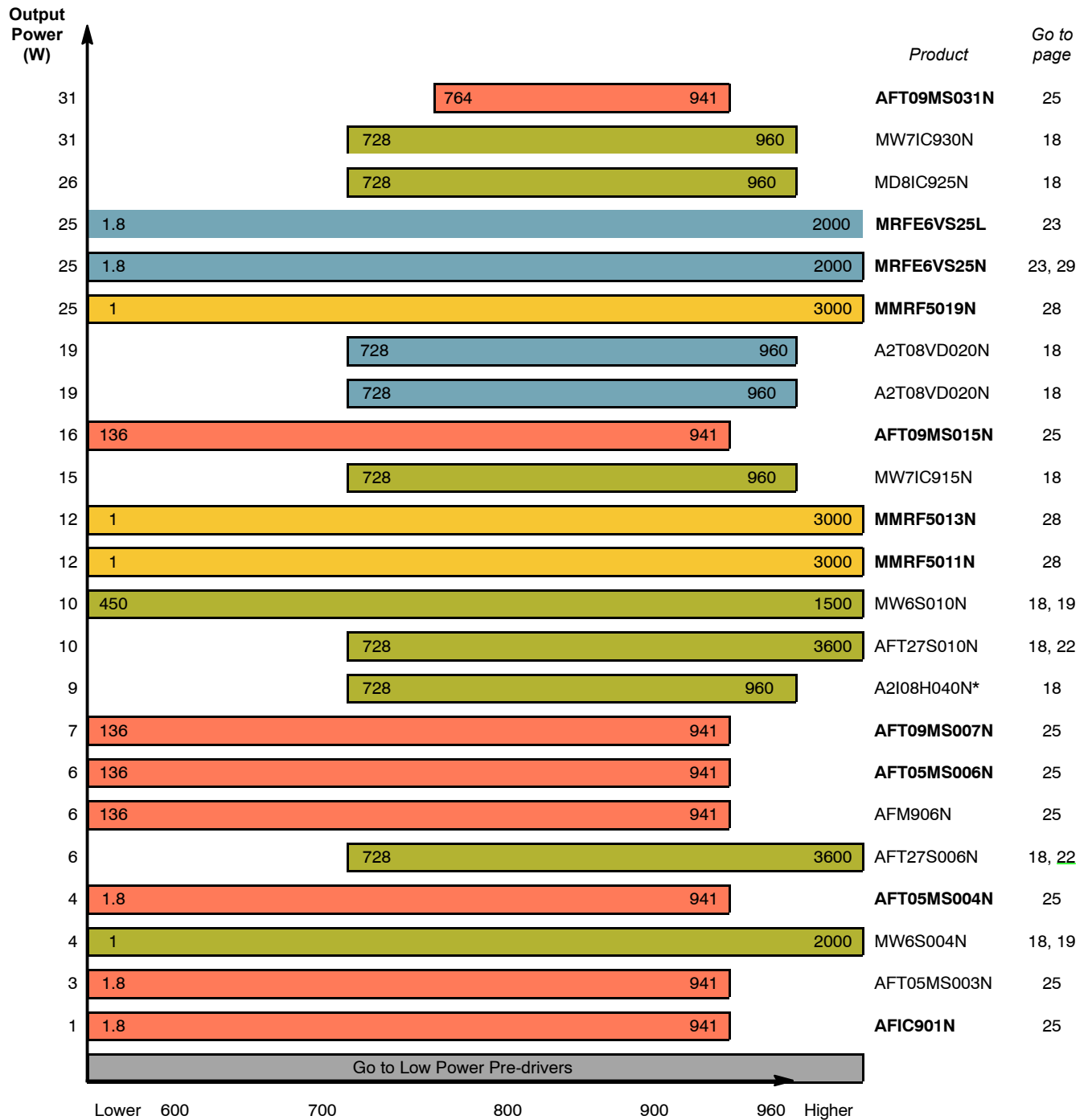


Table 2. RF Power Products — 600–960 MHz (continued)



Bold = In NXP Product Longevity program
*Output Power measured at P3dB

RF Power Product Portfolio (continued)

Table 3. RF Power Products — 960–1800 MHz

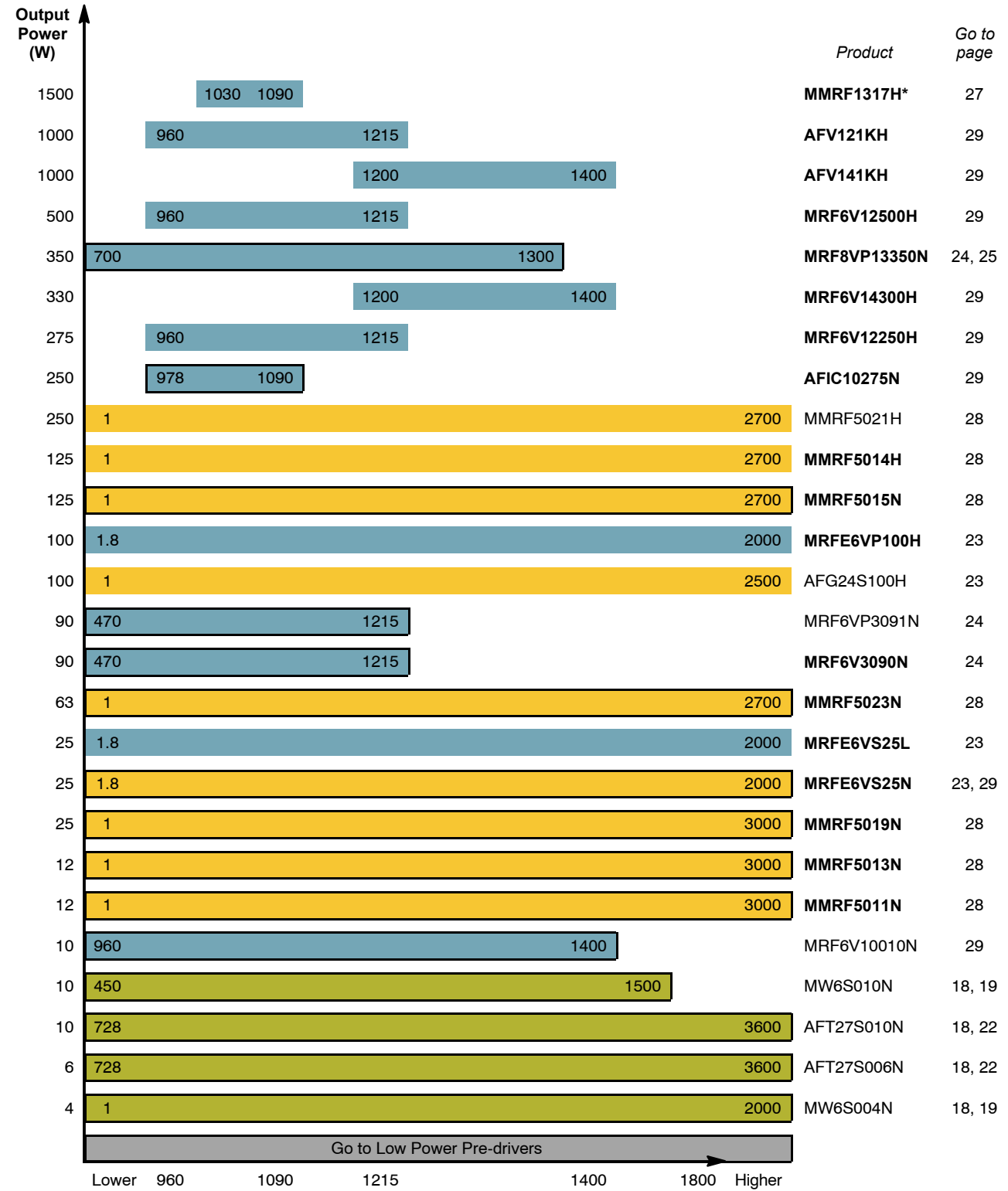
- 48–50 V LDMOS

28–32 V LDMOS

7.2–12.5 V LDMOS
- GaN

GaAs

Plastic

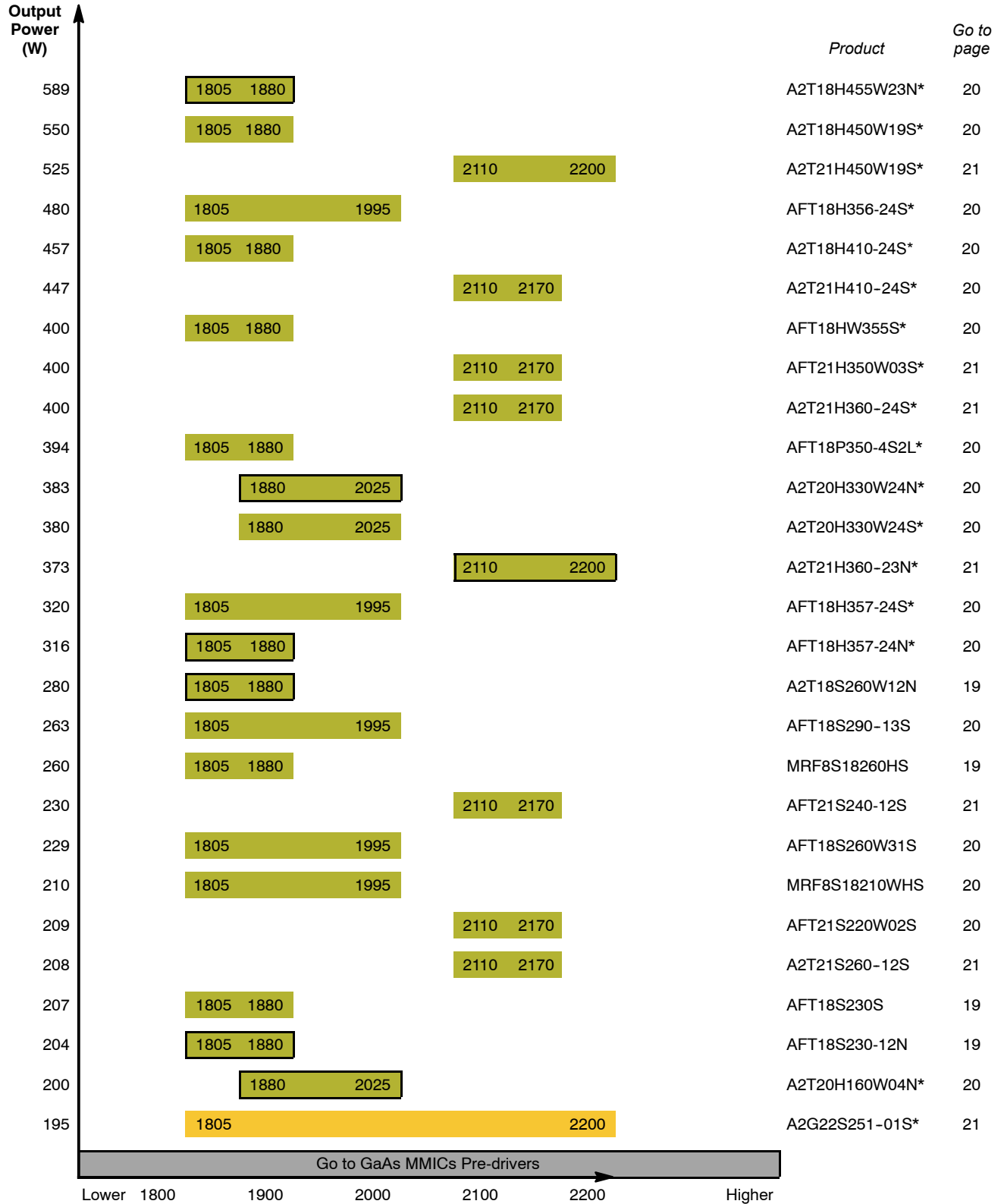


Bold = In NXP Product Longevity program
*Output Power measured at P3dB

RF Power Product Portfolio (continued)

48–50 V LDMOS	GaN
28–32 V LDMOS	GaAs
7.2–12.5 V LDMOS	Plastic

Table 4. RF Power Products — 1800–2200 MHz



(continued)

* Output Power measured at P3dB

RF Power Product Portfolio (continued)

Table 4. RF Power Products — 1800–2200 MHz (continued)

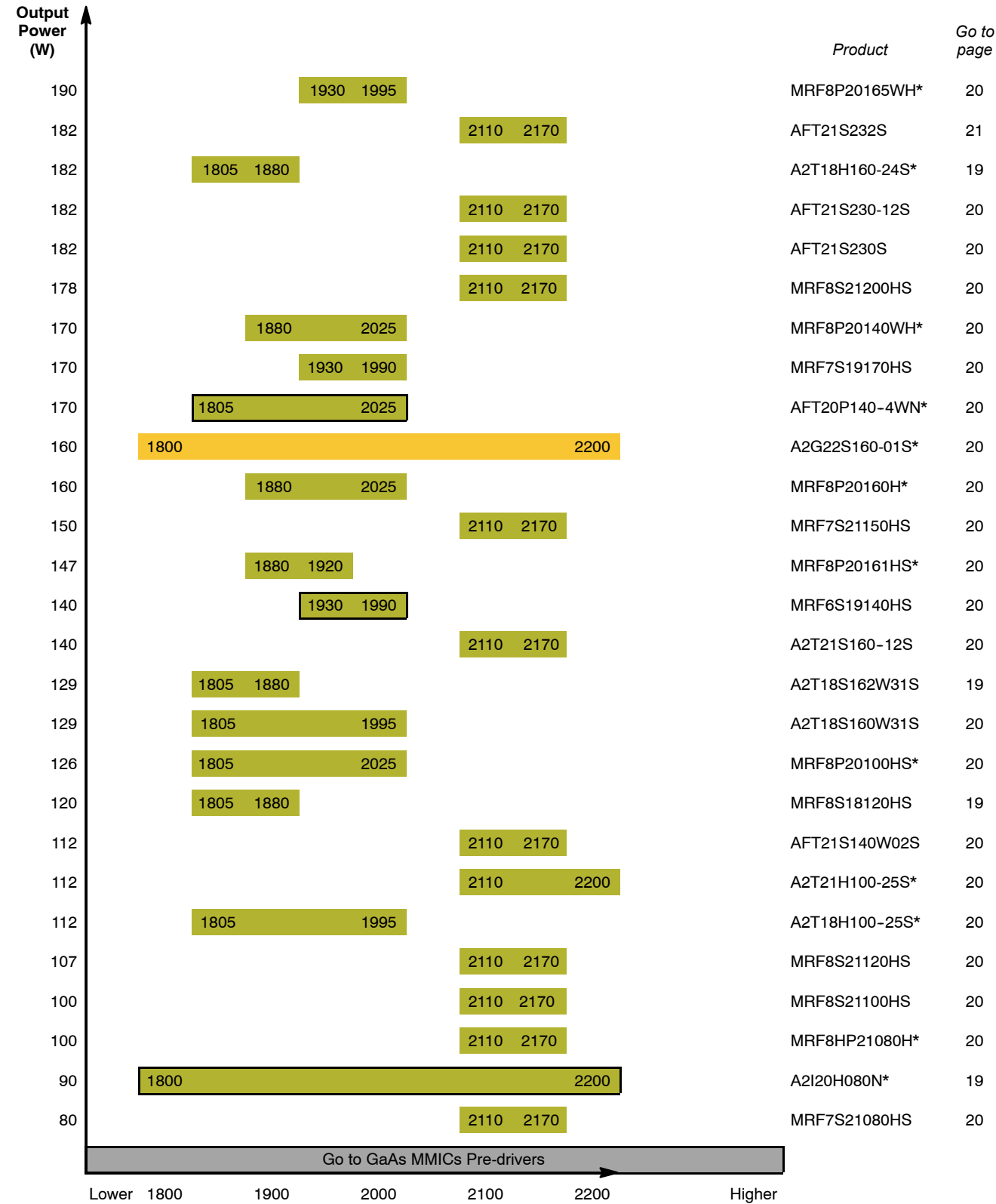
- 48–50 V LDMOS

28–32 V LDMOS

7.2–12.5 V LDMOS
- GaN

GaAs

Plastic



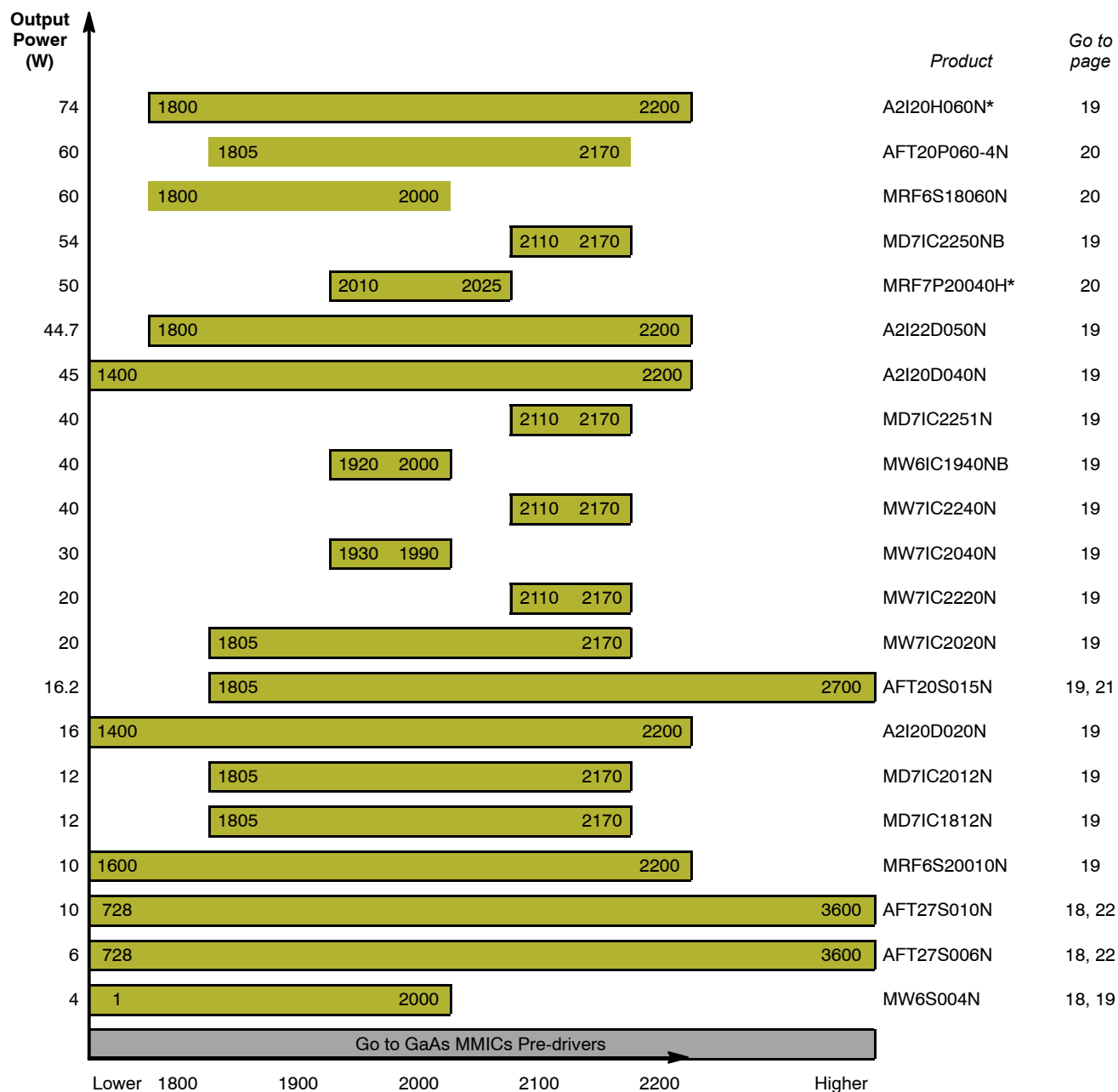
(continued)

* Output Power measured at P3dB

RF Power Product Portfolio (continued)

48–50 V LDMOS	GaN
28–32 V LDMOS	GaAs
7.2–12.5 V LDMOS	Plastic

Table 4. RF Power Products — 1800–2200 MHz (continued)

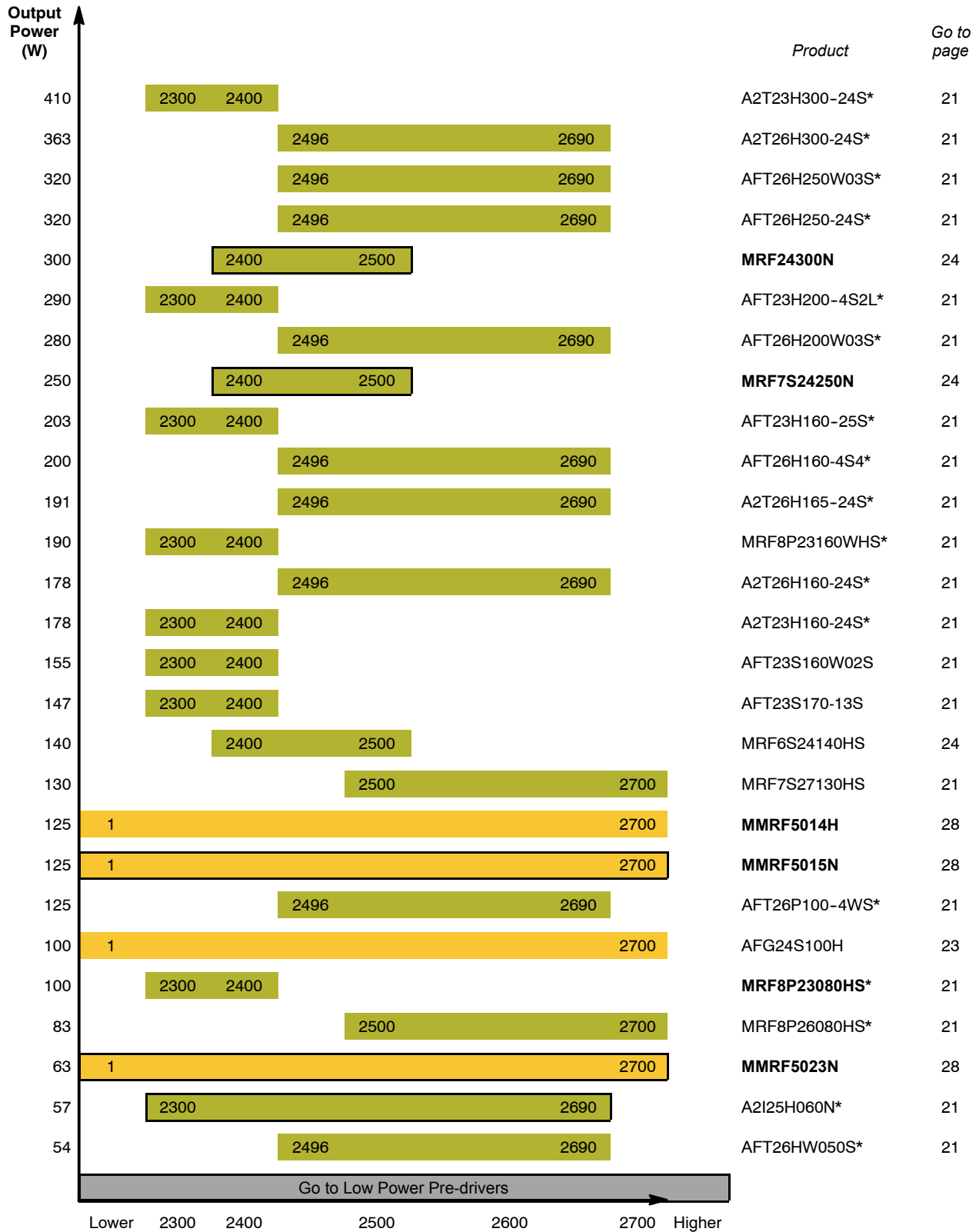


*Output Power measured at P3dB

RF Power Product Portfolio (continued)

Table 5. RF Power Products — 2200–2700 MHz

48–50 V LDMOS	GaN
28–32 V LDMOS	GaAs
7.2–12.5 V LDMOS	Plastic



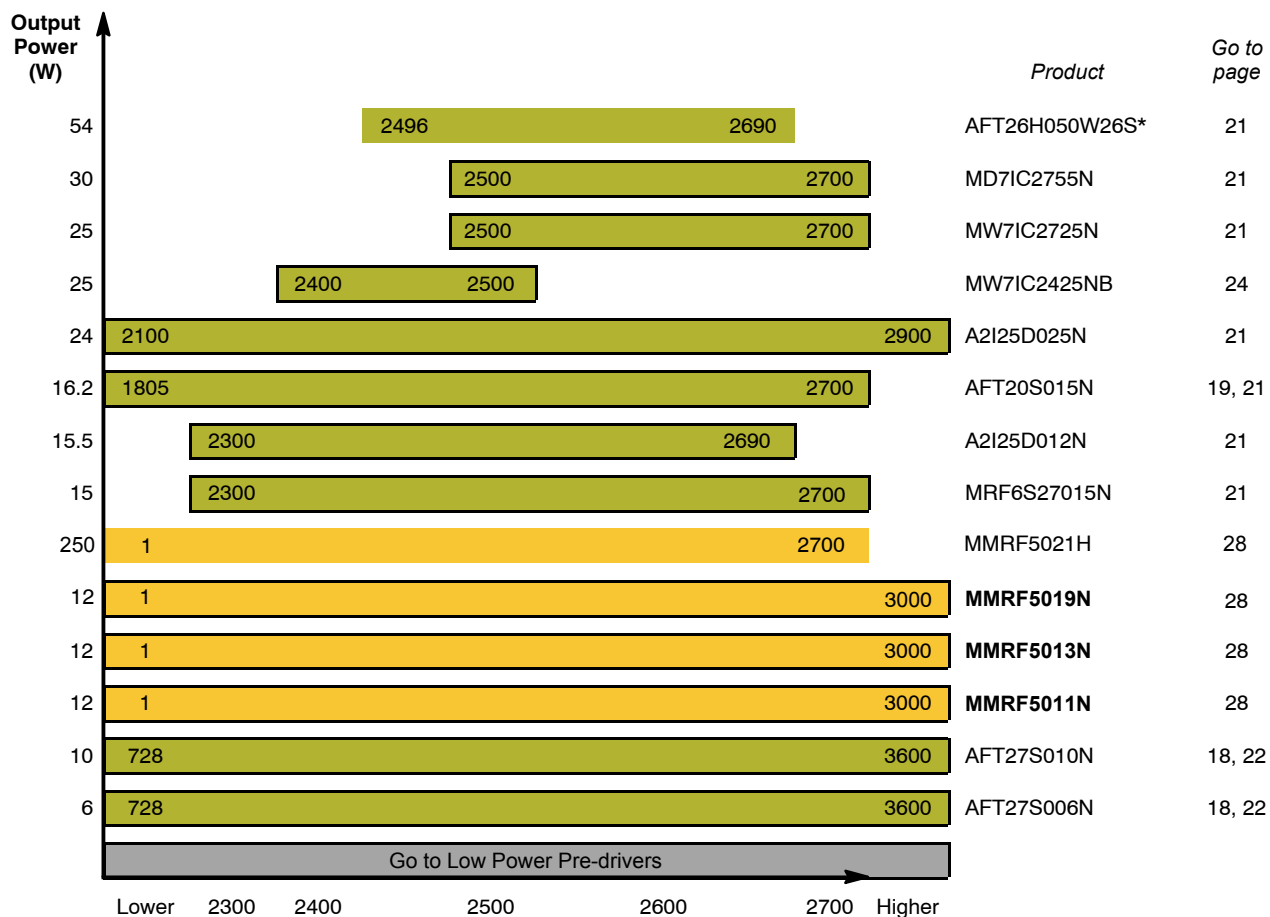
(continued)

Bold = In NXP Product Longevity program
*Output Power measured at P3dB

RF Power Product Portfolio (continued)

48–50 V LDMOS	GaN
28–32 V LDMOS	GaAs
7.2–12.5 V LDMOS	Plastic

Table 5. RF Power Products — 2200–2700 MHz (continued)



Bold = In NXP Product Longevity program

RF Power Product Portfolio (continued)

Table 6. RF Power Products — 2700–3800 MHz

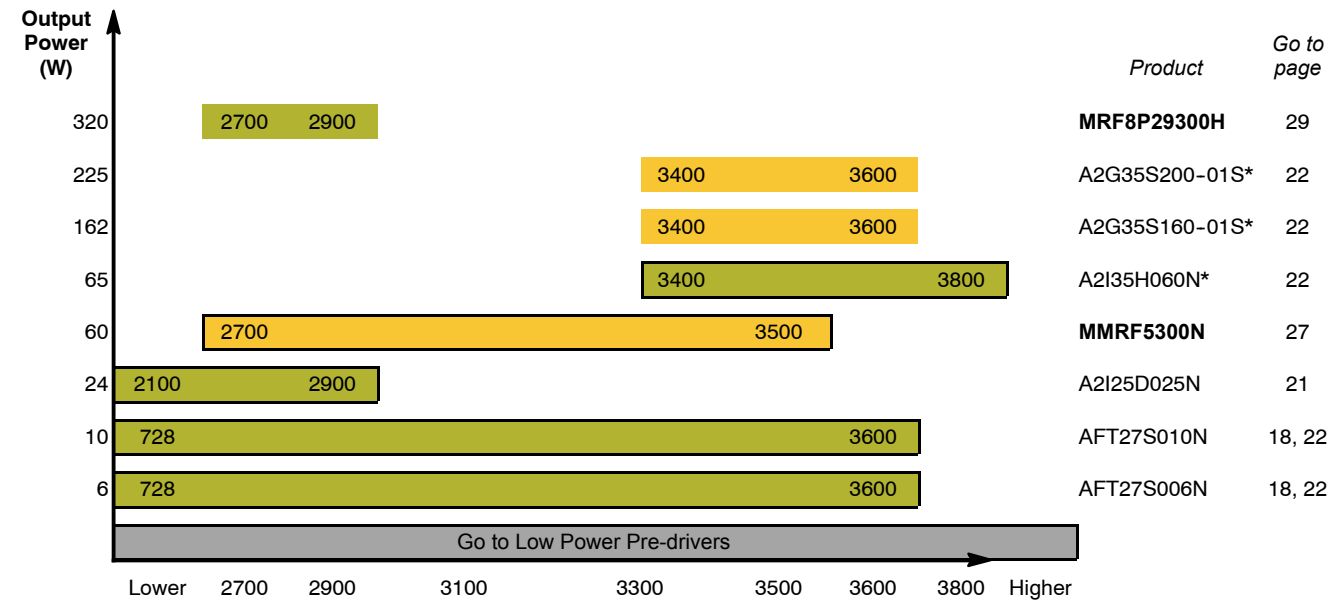
- 48–50 V LDMOS

28–32 V LDMOS

7.2–12.5 V LDMOS
- GaN

GaAs

Plastic



Bold = In NXP Product Longevity program
* Output Power measured at P3dB

RF Power Product Portfolio (continued)

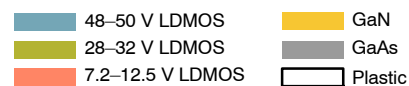
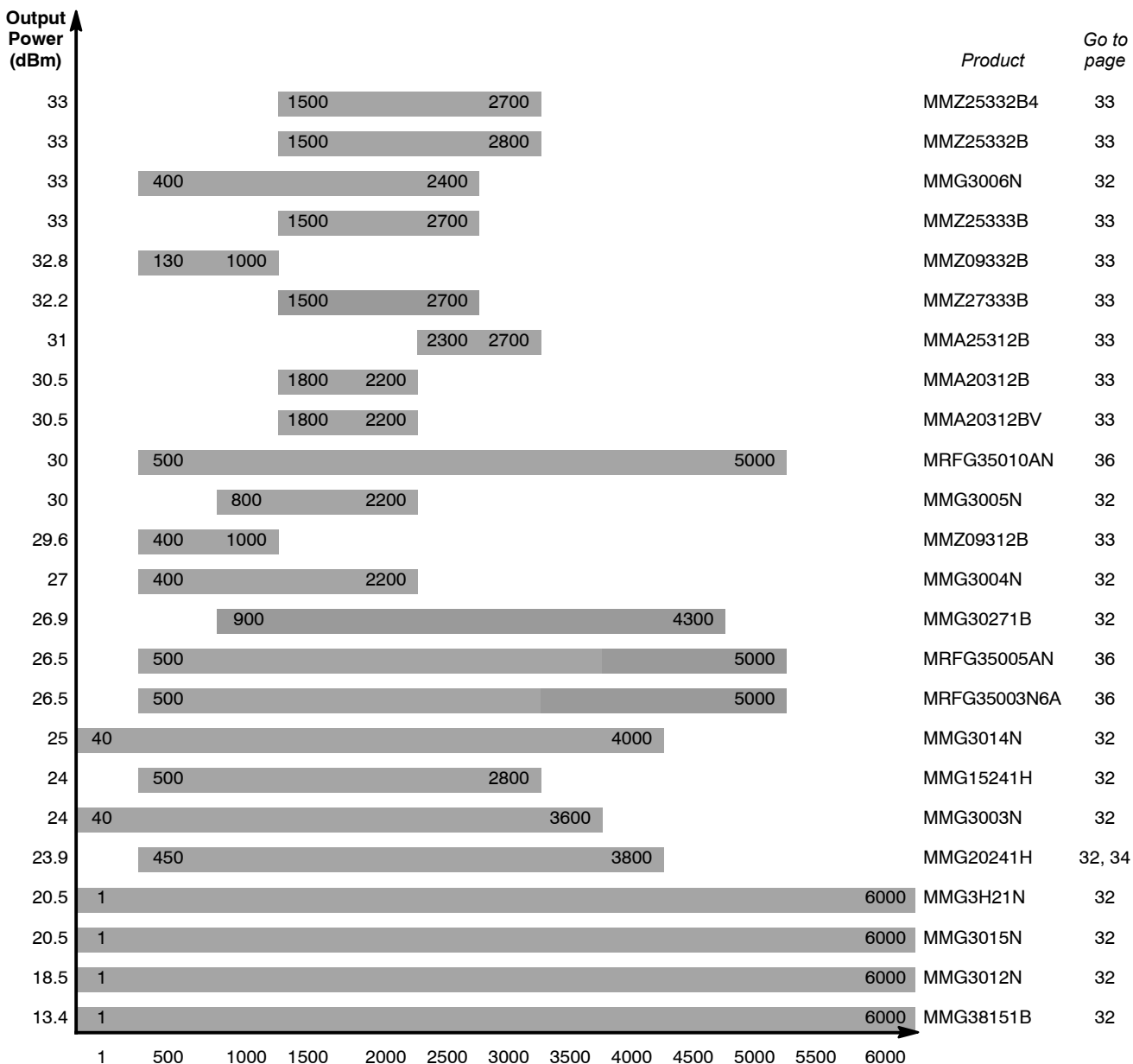


Table 7. RF Power Products — Low Power Pre-drivers



RF Cellular Infrastructure

The NXP RF cellular infrastructure high power portfolio offers a full lineup of LDMOS and GaN power transistors and solutions for base stations and wireless infrastructure applications. Devices are designed for 450–1000 MHz, 1450–2200 MHz, 2300–2690 MHz and 3400–3800 MHz frequency operation, supporting cellular standards such as LTE, W-CDMA/UMTS, GSM, EDGE, CDMA and TD-SCDMA.

Table 1. 450–1000 MHz

Product	Frequency Band ⁽³⁾ MHz	P _{out} (Typ) Watts	Test Signal	V _{DD} Volts	Gain (Typ)/Freq. dB/MHz	Eff. (Typ) %	θ _{JC} °C/W	Packaging
MW6S004NT1	U	1–2000	4 PEP	28	18/1960	33	8.8	PLD-1.5
AFT27S006NT1	U	728–3600	0.76 Avg.	28	22.5/2170	20.2	3.4	PLD-1.5W
AFT27S010NT1	U	728–3600	1.26 Avg.	28	21.7/2170	22.6	3.5	PLD-1.5W
MW6S010NR1	U	450–1500	10 PEP	28	18/960	32	2.85	TO-270-2
MW6S010GNR1	U	450–1500	10 PEP	28	18/960	32	2.85	TO-270G-2
MW7IC915NT1	I	865–895	1.6 Avg.	28	38/880	17.4	3.2	PQFN 8 × 8
A2T08VD020NT1★	I	728–960	2 Avg.	48	19.1/960	21.1	3.7	PQFN 8 × 8
MD8IC925NR1	I/O	728–960	2.5 Avg.	28	36.2/940	17.4	1.8	TO-270WB-14
MD8IC925GNR1	I/O	728–960	2.5 Avg.	28	36.2/940	17.4	1.8	TO-270WBG-14
MW7IC930NR1	I/O	920–960	3.2 Avg.	28	35.9/940	16.5	1.6	TO-270WBL-16
MW7IC930GNR1	I/O	920–960	3.2 Avg.	28	35.9/940	16.5	1.6	TO-270WBLG-16
MW7IC930NBR1	I/O	920–960	3.2 Avg.	28	35.9/940	16.5	1.6	TO-272WB-16
A2I08H040NR1★	I	728–960	9 Avg.	28	30.7/920	45.9	3.4	TO-270WB-15
A2I08H040GNR1★	I	728–960	9 Avg.	28	30.7/920	45.9	3.4	TO-270WBG-15
MRF8S7120NR3	I/O	728–768	32 Avg.	28	19.2/768	38.1	0.65	OM-780-2L
MRF8S7170NR3	I/O	728–768	50 Avg.	28	19.5/748	37	0.37	OM-780-2L
MRF8S7235NR3	I/O	728–768	63 Avg.	28	20/728	36.1	0.33	OM-780-2L
MRF8P8300HR6	I/O	790–820	96 Avg.	28	20.9/820	35.7	0.26	NI-1230H-4S
MRF8P8300HSR6	I/O	790–820	96 Avg.	28	20.9/820	35.7	0.26	NI-1230S-4S
MRFE6S9045NR1	U	865–895	10 Avg.	28	22.1/880	32	1.1	TO-270-2
MRFE6S9060NR1	U	865–895	14 Avg.	28	21.4/880	32.1	0.88	TO-270-2
MRFE6S9125NR1	I	865–895	27 Avg.	28	20.2/880	31	0.45	TO-270WB-4
MRFE6S9125NBR1	I	865–895	27 Avg.	28	20.2/880	31	0.45	TO-272WB-4
MD8IC970NR1	I/O	850–940	35 Avg.	28	32.6/940	42.1	0.6	TO-270WBL-16
MD8IC970GNR1	I/O	850–940	35 Avg.	28	32.6/940	42.1	0.6	TO-270WBLG-16
MRF8P9040NR1	I	728–960	4 Avg.	28	19.9/960	19.1	1.5	TO-270WB-4
MRF8P9040GNR1	I	728–960	4 Avg.	28	19.9/960	19.1	1.5	TO-270WBG-4
MRFE6S9046GNR1	I/O	920–960	35.5 CW	28	19/960	57	1.3	TO-270WBG-4
MWE6IC9080NBR1	I/O	865–960	80 CW	28	28.5/960	52.3	0.52	TO-272WB-14
MRF5S9080NBR1	I	869–960	80 CW	26	18.5/960	60	0.5	TO-272WB-4
MWE6IC9100NBR1	I	869–960	100 CW	26	33.5/960	54	0.38	TO-272WB-14
MRF8S9100HSR3	I	920–960	72 CW	28	19.3/920	51.6	0.65	NI-780S-2L
MRF8S9102NR3	I/O	865–960	28 Avg.	28	23.1/920	36.4	0.63	OM-780-2L
MRF8S9120NR3	I/O	865–960	33 Avg.	28	19.8/960	34.2	0.62	OM-780-2L
A2T07D160W04SR3	I/O	716–960	30 Avg.	28	21.5/803	48.5	0.63	NI-780S-4L
MRFE6S9160HSR3	I	865–960	35 Avg.	28	21/880	31	0.33	NI-780S-2L
MRF8S9170NR3	I/O	920–960	50 Avg.	28	19.3/920	36.5	0.38	OM-780-2L
AFT09S200W02NR3	I/O	716–960	56 Avg.	28	19.2/960	36.5	0.35	OM-780-2L
AFT09S200W02GNR3	I/O	716–960	56 Avg.	28	19.2/960	36.5	0.35	OM-780G-2L
AFT09S200W02SR3	I/O	920–960	56 Avg.	28	19.4/960	35.6	0.34	NI-780S-2L
MRF8S9200NR3	I/O	920–960	58 Avg.	28	19.9/940	37.1	0.30	OM-780-2L
MRF8S9202GNR3	I/O	865–960	58 Avg.	28	19.0/920	36.3	0.31	OM-780G-2L
MRF8P9210NR3	I/O	920–960	63 Avg.	28	16.7/960	47.4	0.53	OM-780-4L
AFT09S220-02NR3★	I/O	850–960	54 Avg.	28	19.5/920	35.8	0.3	OM-780-2L
MRF8S9220HSR3	I/O	920–960	65 Avg.	28	19.4/960	35.7	0.39	NI-780S-2L
MRF8S9232NR3	I/O	865–960	63 Avg.	28	18.1/960	36.3	0.27	OM-780-2L
A2T09VD250NR1★	I	716–960	65 Avg.	48	22.5/920	34.8	0.56	TO-270WB-6A
MRF8S9260HSR3	I/O	920–960	75 Avg.	28	18.6/960	38.5	0.37	NI-880S-2L
AFT09S282NR3	I/O	720–960	80 Avg.	28	20/960	36.1	0.31	OM-780-2L
A2T09VD300NR1★	I	716–960	79 Avg.	48	21.5/920	34.4	0.66	TO-270WB-6A

⁽³⁾U = Unmatched; I = Input; I/O = Input/Output.

★New Product

RF Cellular Infrastructure (continued)

Table 1. 450–1000 MHz (continued)

Product	Frequency Band ⁽³⁾ MHz		P _{out} (Typ) Watts	Test Signal	V _{DD} Volts	Gain (Typ)/Freq. dB/MHz	Eff. (Typ) %	θ _{JC} °C/W	Packaging
A2V09H300–04NR3★	I/O	720–960	79 Avg.	W-CDMA	48	19.7/940	55.9	0.34	OM-780-4L
A2T09D400–23NR6★	I/O	716–960	93 Avg.	W-CDMA	28	17.9/836	48	0.29	OM-1230-4L2S
MRF8P9300HSR6	I/O	920–960	100 Avg.	W-CDMA	28	19.4/960	35.8	0.22	NI-1230S-4S
A2T07H310–24SR6	I/O	716–960	47 Avg.	W-CDMA	28	18.6/880	51.3	0.36	NI-1230S-4L2L
AFT09H310–03SR6	I/O	920–960	56 Avg.	W-CDMA	28	17.9/920	47.4	0.41	NI-1230S-4S
AFT09H310–04GSR6	I/O	920–960	56 Avg.	W-CDMA	28	17.9/920	47.4	0.41	NI-1230GS-4L
AFV09P350–04NR3	I/O	720–960	100 Avg.	W-CDMA	48	19.5/920	48.5	0.45	OM-780-4L
AFV09P350–04GNR3	I/O	720–960	100 Avg.	W-CDMA	48	19.5/920	48.5	0.45	OM-780G-4L

Table 2. 1450–2200 MHz

Product	Frequency Band ⁽³⁾ MHz		P _{out} (Typ) Watts	Test Signal	V _{DD} Volts	Gain (Typ)/Freq. dB/MHz	Eff. (Typ) %	θ _{JC} °C/W	Packaging
MW6S004NT1	U	1–2000	4 PEP	2–Tone	28	18/1960	33	8.8	PLD–1.5
MW6S010NR1	U	450–1500	10 PEP	2–Tone	28	18/960	32	2.85	TO–270–2
MW6S010GNR1	U	450–1500	10 PEP	2–Tone	28	18/960	32	2.85	TO–270G–2
MRF6S20010NR1	I	1600–2200	10 PEP	2–Tone	28	15.5/2170	36	5.9	TO–270–2
MRF6S20010GNR1	I	1600–2200	10 PEP	2–Tone	28	15.5/2170	36	5.9	TO–270G–2
MD7IC1812NR1	I/O	1805–2170	1.3 Avg.	W–CDMA	28	31.5/1880	14	2.9	TO–270WB–14
MD7IC1812GNR1	I/O	1805–2170	1.3 Avg.	W–CDMA	28	31.5/1880	14	2.9	TO–270WBG–14
MD7IC2012NR1	I/O	1805–2170	1.3 Avg.	W–CDMA	28	31.5/2170	14.9	3.1	TO–270WB–14
MD7IC2012GNR1	I/O	1805–2170	1.3 Avg.	W–CDMA	28	31.5/2170	14.9	3.1	TO–270WBG–14
AFT20S015NR1	I	1805–2700	1.5 Avg.	W–CDMA	28	17.6/2170	22	4.2	TO–270–2
AFT20S015GNR1	I	1805–2700	1.5 Avg.	W–CDMA	28	17.6/2170	22	4.2	TO–270G–2
MW7IC2020NT1	I/O	1805–2170	2.4 Avg.	W–CDMA	28	32.6/2140	17	1.9	PQFN 8 × 8
MW7IC2220NR1	I/O	2110–2170	2 Avg.	W–CDMA	28	31/2170	13	1.5	TO–270WB–16
MW7IC2220GNR1	I/O	2110–2170	2 Avg.	W–CDMA	28	31/2170	13	1.5	TO–270WBG–16
MW7IC2220NBR1	I/O	2110–2170	2 Avg.	W–CDMA	28	31/2170	13	1.5	TO–272WB–16
A2I20D020NR1★	I/O	1400–2200	2.5 Avg	W–CDMA	28	31/1800	19.7	2.9	TO–270WB–17
A2I20D020GNR1★	I/O	1400–2200	2.5 Avg	W–CDMA	28	31/1800	19.7	2.9	TO–270WBG–17
MW7IC2040NR1	I/O	1930–1990	4 Avg.	W–CDMA	28	32/1930	17.5	1.5	TO–270WBL–16
MW7IC2040NBR1	I/O	1930–1990	4 Avg.	W–CDMA	28	32/1930	17.5	1.5	TO–272WB–16
MW7IC2240NR1	I/O	2110–2170	4 Avg.	W–CDMA	28	30/2110	14	1.3	TO–270WB–16
MW7IC2240GNR1	I/O	2110–2170	4 Avg.	W–CDMA	28	30/2110	14	1.3	TO–270WBG–16
MW6IC1940NBR1	I/O	1920–2000	4.5 Avg.	W–CDMA	28	28.5/1920	13.5	1.2	TO–272WB–16
A2I20D040NR1★	I/O	1400–2200	5 Avg	W–CDMA	28	32.7/1800	21.8	1.3	TO–270WB–17
A2I20D040GNR1★	I/O	1400–2200	5 Avg	W–CDMA	28	32.7/1800	21.8	1.3	TO–270WBG–17
A2I22D050NR1	I	1800–2200	5.3 Avg.	W–CDMA	28	32.6/2170	17.9	1.1	TO–270WB–15
A2I22D050GNR1	I	1800–2200	5.3 Avg.	W–CDMA	28	32.6/2170	17.9	1.1	TO–270WBG–15
MD7IC2250GNR1	I/O	2110–2170	5.3 Avg.	W–CDMA	28	31.1/2170	16.8	1.1	TO–270WBG–14
MD7IC2250NBR1	I/O	2110–2170	5.3 Avg.	W–CDMA	28	31.1/2170	16.8	1.1	TO–272WB–14
MD7IC2251NR1	I/O	2110–2170	12 Avg.	W–CDMA	28	29.0/2140	37.9	1.5	TO–270WB–14
MD7IC2251GNR1	I/O	2110–2170	12 Avg.	W–CDMA	28	29.0/2140	37.9	1.5	TO–270WBG–14
A2I20H060NR1★	I/O	1800–2200	12 Avg	W–CDMA	28	28.4/1840	43.8	1.6	TO–270WB–15
A2I20H060GNR1★	I/O	1800–2200	12 Avg	W–CDMA	28	28.4/1840	43.8	1.6	TO–270WBG–15
A2I20H080NR1★	I/O	1800–2200	13.5 Avg	W–CDMA	30	28.2/1840	43.4	1.9	TO–270WB–15
A2I20H080GNR1★	I/O	1800–2200	13.5 Avg	W–CDMA	30	28.2/1840	43.4	1.9	TO–270WBG–15
MRF8S18120HSR3	I/O	1805–1880	72 CW	CW	28	18.2/1805	49.8	0.47	NI–780S–2L
A2T18H160–24SR3★	I/O	1805–1880	28 Avg.	W–CDMA	28	17.9/1805	49.9	0.45	NI–780S–4L2L
A2T18S162W31SR3★	I/O	1805–1880	32 Avg.	W–CDMA	28	20.1/1840	33.9	0.36	NI–780S–2L2LA
A2T18S162W31GSR3★	I/O	1805–1880	32 Avg.	W–CDMA	28	20.1/1840	33.9	0.36	NI–780GS–2L2LA
AFT18S230–12NR3★	I/O	1805–1880	50 Avg.	W–CDMA	28	17.6/1880	33.8	0.27	OM–780–2L2L
AFT18S230SR3	I/O	1805–1880	50 Avg.	W–CDMA	28	19.0/1880	32.0	0.41	NI–780S–2L4S
A2T18S260W12NR3★	I/O	1805–1880	56 Avg.	W–CDMA	28	18.7/1880	34.4	0.23	OM–880X–2L2L
MRF8S18260HSR6	I/O	1805–1880	74 Avg.	W–CDMA	30	17.9/1805	31.6	0.27	NI–1230S–4S4S

⁽³⁾U = Unmatched; I = Input; I/O = Input/Output.

★New Product

RF Cellular Infrastructure (continued)

Table 2. 1450–2200 MHz (continued)

Product	Frequency Band ⁽³⁾ MHz	P _{out} (Typ) Watts	Test Signal	V _{DD} Volts	Gain (Typ)/Freq. dB/MHz	Eff. (Typ) %	θ _{JC} °C/W	Packaging
AFT18P350-4S2LR6	I/O 1805–1880	63 Avg.	W-CDMA	28	16.1/1805	44.5	0.39	NI-1230S-4L2L
AFT18HW355SR6	I/O 1805–1880	63 Avg.	W-CDMA	28	15.2/1880	48.3	0.47	NI-1230S-4S
AFT18H357-24NR6	I/O 1805–1880	63 Avg.	W-CDMA	28	17.5/1805	48.7	0.23	OM-1230-4L2L
A2T18H410-24SR6	I/O 1805–1880	71 Avg.	W-CDMA	28	17.4/1805	51.2	0.24	NI-1230S-4L2L
A2T18H450W19SR6★	I/O 1805–1880	89 Avg.	W-CDMA	30	16.5/1880	47.7	0.27	NI-1230S-4S4S
A2T18H455W23NR6★	I/O 1805–1880	87 Avg.	W-CDMA	31.5	15.9/1880	48.4	0.23	OM-1230-4L2S
MRF8P20161HSR3	I/O 1880–1920	37 Avg.	W-CDMA	28	16.4/1920	45.8	0.76	NI-780S-4L
MRF6S19140HSR3	I/O 1930–1990	29 Avg.	N-CDMA	28	16/1990	27.5	0.38	NI-880S-2L
MRF7S19170HSR3	I/O 1930–1990	50 Avg.	W-CDMA	28	17.2/1990	32	0.31	NI-880S-2L
A2T18H100-25SR3	I/O 1805–1995	18 Avg.	W-CDMA	28	18.1/1805	50.2	0.74	NI-780S-4L4S
A2T18S160W31SR3	I/O 1805–1995	32 Avg.	W-CDMA	28	19.9/1880	31.6	0.36	NI-780S-2L2LA
A2T18S160W31GSR3	I/O 1805–1995	32 Avg.	W-CDMA	28	19.9/1880	31.6	0.36	NI-780GS-2L2LA
A2T18S165-12S ^(2a)	I/O 1805–1995	38 Avg.	W-CDMA	28	18.0/1840	34	—	NI-780S-2L2L
A2T18S260-12S ^(2a)	I/O 1805–1995	63 Avg.	W-CDMA	28	18.9/1805	30.1	—	NI-780S-2L2L
MRF8P20165WHR3	I/O 1930–1995	37 Avg.	W-CDMA	28	16.3/1995	46.0	0.79	NI-780H-4L
AFT18S260W31SR3	I/O 1805–1995	50 Avg.	W-CDMA	28	19.8/1880	29.3	0.32	NI-780S-2L2LA
AFT18S260W31GSR3	I/O 1805–1995	50 Avg.	W-CDMA	28	19.8/1880	29.3	0.32	NI-780GS-2L2LA
MRF8S18210WHSR3	I/O 1805–1995	50 Avg.	W-CDMA	30	17.8/1930	29.2	0.48	NI-880XS-2L
MRF8S18210WGHSR3	I/O 1805–1995	50 Avg.	W-CDMA	30	17.8/1930	29.2	0.48	NI-880XGS-2L
AFT18S290-13SR3	I/O 1805–1995	63 Avg.	W-CDMA	28	18.2/1960	31.2	0.42	NI-880XS-2L4S
AFT18H356-24SR6	I/O 1805–1995	63 Avg.	W-CDMA	28	15/1880	46.7	0.47	NI-1230S-4L2L
AFT18H357-24SR6	I/O 1805–1995	63 Avg.	W-CDMA	28	17.3/1805	50.3	0.43	NI-1230S-4L2L
AFT20P140-4WNR3	I/O 1880–2025	24 Avg.	W-CDMA	28	17.6/2025	41.2	0.60	OM-780-4L
AFT20P140-4WGNR3	I/O 1880–2025	24 Avg.	W-CDMA	28	17.6/2025	41.2	0.60	OM-780G-4L
MRF6S18060NR1	I/O 1805–2000	60 CW	CW	26	15/1990	50	0.81	TO-270WB-4
MRF8P20100HSR3	I/O 1805–2025	20 Avg.	W-CDMA	28	16/2025	44.3	0.72	NI-780S-4L
MRF8P20140WHR3	I/O 1880–2025	24 Avg.	W-CDMA	28	15.9/2025	42.0	0.68	NI-780H-4L
MRF8P20140WHSR3	I/O 1880–2025	24 Avg.	W-CDMA	28	15.9/2025	42.0	0.68	NI-780S-4L
MRF8P20140WGHSR3	I/O 1880–2025	24 Avg.	W-CDMA	28	15.9/2025	42.0	0.68	NI-780GS-4L
A2T20H160W04NR3★	I/O 1880–2025	28 Avg.	W-CDMA	28	17/1960	47.7	0.45	OM-780-4L
MRF8P20160HR3	I/O 1880–2025	37 Avg.	W-CDMA	28	16.5/1920	45.8	0.75	NI-780H-4L
MRF8P20160HSR3	I/O 1880–2025	37 Avg.	W-CDMA	28	16.5/1920	45.8	0.75	NI-780S-4L
A2T20H330W24N ^(2a)	I/O 1880–2025	55 Avg.	W-CDMA	28	15.9/1880	49.8	0.26	OM-1230-4L2L
A2T20H330W24SR6	I/O 1880–2025	58 Avg.	W-CDMA	28	16.5/1880	50.9	0.25	NI-1230S-4L2L
MRF7P20040HSR3	I/O 2010–2025	10 Avg.	W-CDMA	32	18.2/2025	42.6	2.11	NI-780S-4L
AFT20P060-4NR3	I/O 1805–2170	6.3 Avg.	W-CDMA	28	18.9/2170	20	0.56	OM-780-4L
AFT20P060-4GNR3	I/O 1805–2170	6.3 Avg.	W-CDMA	28	18.9/2170	20	0.56	OM-780G-4L
MRF7S21080HSR3	I/O 2110–2170	22 Avg.	W-CDMA	28	18/2170	32	0.65	NI-780S-2L
MRF8HP21080HR3	I/O 2110–2170	16 Avg.	W-CDMA	28	14.4/2170	45.7	1.0	NI-780H-4L
MRF8HP21080HSR3	I/O 2110–2170	16 Avg.	W-CDMA	28	14.4/2170	45.7	1.0	NI-780S-4L
A2T21H100-25SR3★	I/O 2110–2170	18 Avg.	W-CDMA	28	17.4/2170	50.5	0.76	NI-780S-4L4S
MRF8S21100HSR3	I/O 2110–2170	24 Avg.	W-CDMA	28	18.3/2170	33.4	0.48	NI-780S-2L
MRF8S21120HSR3	I/O 2110–2170	28 Avg.	W-CDMA	28	17.6/2170	34	0.53	NI-780S-2L
AFT21S140W02SR3	I/O 2110–2170	32 Avg.	W-CDMA	28	19.3/2140	33.5	0.59	NI-780S-2L
AFT21S140W02GSR3	I/O 2110–2170	32 Avg.	W-CDMA	28	19.3/2140	33.5	0.59	NI-780GS-2L
MRF7S21150HSR3	I/O 2110–2170	44 Avg.	W-CDMA	28	17.5/2110	31	0.37	NI-780S-2L
A2T21S160-12SR3★	I/O 2110–2170	38 Avg.	W-CDMA	28	18.4/2170	32.9	0.3	NI-780S-2L2L
A2G22S160-01SR3	I 1800–2200	32 Avg.	W-CDMA	48	19.6/2110	38	1.7	NI-400S-2S
MRF8S21200HSR6	I/O 2110–2170	48 Avg.	W-CDMA	28	18.1/2140	32.6	0.31	NI-1230S-4S
AFT21S220W02SR3	I/O 2110–2170	50 Avg.	W-CDMA	28	19.1/2140	29.3	0.56	NI-780S-2L
AFT21S220W02GSR3	I/O 2110–2170	50 Avg.	W-CDMA	28	19.1/2140	29.3	0.56	NI-780GS-2L
AFT21S230SR3	I/O 2110–2170	50 Avg.	W-CDMA	28	16.7/2110	30.5	0.43	NI-780S-2L4S
AFT21S230-12SR3	I/O 2110–2170	50 Avg.	W-CDMA	28	16.7/2110	30.5	0.43	NI-780S-2L2L

⁽²⁾To be introduced: a) 2Q16; b) 3Q16; c) 4Q16.

⁽³⁾U = Unmatched; I = Input; I/O = Input/Output.

★New Product

RF Cellular Infrastructure (continued)

Table 2. 1450–2200 MHz (continued)

Product	Frequency Band ⁽³⁾ MHz		P _{out} (Typ) Watts	Test Signal	V _{DD} Volts	Gain (Typ)/Freq. dB/MHz	Eff. (Typ) %	θ _{JC} °C/W	Packaging
AFT21S232SR3	I/O	2110–2170	50 Avg.	W-CDMA	28	16.7/2110	30.5	0.43	NI-780S-2L
AFT21S240-12SR3	I/O	2110–2170	55 Avg.	W-CDMA	28	20.4/2170	33.9	0.35	NI-880XS-2L2L
A2G22S251-01SR3★	I	1805–2200	48 Avg.	W-CDMA	48	17.7/2170	37.5	1.3	NI-400S-2S
A2T21S260-12SR3★	I/O	2110–2170	65 Avg.	W-CDMA	28	18.7/2170	30.6	0.28	NI-780S-2L2L
AFT21H350W03SR6	I/O	2110–2170	63 Avg.	W-CDMA	28	16.4/2110	47.1	0.49	NI-1230S-4S
AFT21H350W04GSR6	I/O	2110–2170	63 Avg.	W-CDMA	28	16.4/2110	47.1	0.49	NI-1230GS-4L
A2T21H360-23NR6★	I/O	2110–2200	63 Avg.	W-CDMA	28	16.8/2140	49.7	0.19	OM-1230-4L2S
A2T21H360-24SR6	I/O	2110–2170	63 Avg.	W-CDMA	28	16.2/2140	51.8	0.33	NI-1230S-4L2L
A2T21H410-24SR6★	I/O	2110–2170	72 Avg.	W-CDMA	28	15.6/2170	48.9	0.24	NI-1230S-4L2L
A2T21H450W19SR6★	I/O	2110–2200	89 Avg.	W-CDMA	30	15.7/2110	46.1	0.26	NI-1230S-4S4S

Table 3. 2300–2690 MHz

Product	Frequency Band ⁽³⁾ MHz		P _{out} (Typ) Watts	Test Signal	V _{DD} Volts	Gain (Typ)/Freq. dB/MHz	Eff. (Typ) %	θ _{JC} °C/W	Packaging
A2I25D012NR1	I	2300–2690	2.2 Avg.	W-CDMA	28	33.2/2690	19.8	3.3	TO-270WB-15
A2I25D012GNR1	I	2300–2690	2.2 Avg.	W-CDMA	28	33.2/2690	19.8	3.3	TO-270WBG-15
AFT20S015NR1	I	1805–2690	1.5 Avg.	W-CDMA	28	17.6/2170	22	4.2	TO-270-2
AFT20S015GNR1	I	1805–2690	1.5 Avg.	W-CDMA	28	17.6/2170	22	4.2	TO-270G-2
MRF6S27015NR1	I	2300–2700	3 Avg.	W-CDMA	28	14/2600	22	2.2	TO-270-2
A2I25D025NR1	I	2100–2900	3.2 Avg.	W-CDMA	28	32.5/2600	20	1.8	TO-270WB-17
A2I25D025GNR1	I	2100–2900	3.2 Avg.	W-CDMA	28	32.5/2600	20	1.8	TO-270WBG-17
MW7IC2725NR1	I/O	2500–2700	4 Avg.	WiMAX	28	28.5/2700	17	1.4	TO-270WB-16
MW7IC2725GNR1	I/O	2500–2700	4 Avg.	WiMAX	28	28.5/2700	17	1.4	TO-270WBG-16
MD7IC2755NR1	I/O	2500–2700	10 Avg.	WiMAX	28	25/2700	25	1.8	TO-270WB-14
MD7IC2755GNR1	I/O	2500–2700	10 Avg.	WiMAX	28	25/2700	25	1.8	TO-270WBG-14
A2I25H060NR1★	I	2300–2690	10.5 Avg.	W-CDMA	28	27.5/2590	40.9	2.2	TO-270WB-17
A2I25H060GNR1★	I	2300–2690	10.5 Avg.	W-CDMA	28	27.5/2590	40.9	2.2	TO-270WBG-17
MRF8P23080HSR3	I/O	2300–2400	16 Avg.	W-CDMA	28	14.6/2300	42	0.89	NI-780S-4L
A2T23H160-24SR3★	I/O	2300–2400	28 Avg.	W-CDMA	28	17.7/2300	48.8	0.49	NI-780S-4L2L
AFT23H160-25SR3★	I/O	2300–2400	32 Avg.	W-CDMA	28	16.7/2300	46.6	0.40	NI-880XS-4L4S
AFT23S160W02SR3	I/O	2300–2400	45 Avg.	W-CDMA	28	17.9/2400	30.3	0.53	NI-780S-2L
AFT23S160W02GSR3	I/O	2300–2400	45 Avg.	W-CDMA	28	17.9/2400	30.3	0.53	NI-780GS-2L
MRF8P23160WHSR3	I/O	2300–2400	30 Avg.	W-CDMA	28	14.1/2320	36.5	0.69	NI-780S-4L
AFT23S170-13SR3	I/O	2300–2400	45 Avg.	W-CDMA	28	18.8/2400	33.9	0.42	NI-780S-2L4S
AFT23H200-4S2LR6	I/O	2300–2400	45 Avg.	W-CDMA	28	15.3/2300	42.8	0.32	NI-1230S-4L2L
AFT23H201-24S ^(2a)	I/O	2300–2400	45 Avg.	W-CDMA	28	16.3/2300	46.2	—	ACP-1230S-4L2L
A2T23H300-24SR6★	I/O	2300–2400	66 Avg.	W-CDMA	28	14.9/2300	46.7	0.25	NI-1230S-4L2L
AFT26HW050SR3	I/O	2496–2690	9 Avg.	W-CDMA	28	14.2/2690	47.1	0.75	NI-780S-4L4S
AFT26HW050GSR3	I/O	2496–2690	9 Avg.	W-CDMA	28	14.2/2690	47.1	0.75	NI-780GS-4L4L
AFT26H050W26SR3	I/O	2496–2690	9 Avg.	W-CDMA	28	14.2/2690	47.1	0.75	NI-780S-4L4L
AFT26P100-4WSR3	I/O	2496–2690	22 Avg.	W-CDMA	28	15.3/2690	43.9	0.60	NI-780S-4L
AFT26P100-4WGSR3	I/O	2496–2690	22 Avg.	W-CDMA	28	15.3/2690	43.9	0.60	NI-780GS-4L
A2T26H160-24SR3	I/O	2496–2690	28 Avg.	W-CDMA	28	16.4/2690	48.1	0.56	NI-780S-4L2L
AFT26H160-4S4R3	I/O	2496–2690	32 Avg.	W-CDMA	28	14.9/2496	45.7	0.41	NI-880XS-4L4S
A2T26H165-24SR3★	I/O	2496–2690	32 Avg.	W-CDMA	28	14.7/2496	45.4	0.45	NI-780S-4L2L
AFT26H200W03SR6	I/O	2496–2690	45 Avg.	W-CDMA	28	14.1/2496	45.2	0.46	NI-1230S-4S
AFT26H250-24SR6	I/O	2496–2690	50 Avg.	W-CDMA	28	14.1/2496	44.6	0.42	NI-1230S-4L2L
AFT26H250W03SR6	I/O	2496–2690	50 Avg.	W-CDMA	28	14.1/2496	44.6	0.42	NI-1230S-4S
A2G26H281-04S ^(2a)	I	2496–2690	50 Avg.	W-CDMA	48	15.3/2635	57	—	NI-780S-4L
A2T26H300-24SR6★	I/O	2496–2690	60 Avg.	W-CDMA	28	14.5/2496	42.5	0.29	NI-1230S-4L2L
MRF8P26080HSR3	I/O	2500–2700	14 Avg.	W-CDMA	28	15.0/2620	36.9	0.88	NI-780S-4L
MRF7S27130HSR3	I/O	2500–2700	23 Avg.	WiMAX	28	16.5/2700	20	0.36	NI-780S-2L

⁽²⁾To be introduced: a) 2Q16; b) 3Q16; c) 4Q16.

⁽³⁾U = Unmatched; I = Input; I/O = Input/Output.

★New Product

RF Cellular Infrastructure (continued)

Table 4. 3400–3800 MHz

Product	Frequency Band ⁽³⁾ MHz		P _{out} (Typ) Watts	Test Signal	V _{DD} Volts	Gain (Typ)/Freq. dB/MHz	Eff. (Typ) %	θ _{JC} °C/W	Packaging
AFT27S006NT1	U	728–3600	0.76 Avg.	W-CDMA	28	22.5/2170	20.2	3.4	PLD-1.5W
AFT27S010NT1	U	728–3600	1.26 Avg.	W-CDMA	28	21.7/2170	22.6	3.5	PLD-1.5W
A2I35H060NR1★	I/O	3400–3800	10 Avg.	W-CDMA	28	24/3400	32.4	1.7	TO-270WB-17
A2I35H060GNR1★	I/O	3400–3800	10 Avg.	W-CDMA	28	24/3400	32.4	1.7	TO-270WBG-17
A2G35S160-01SR3★	I	3400–3600	32 Avg.	W-CDMA	48	15.7/3500	36.7	1.9	NI-400S-2S
A2G35S200-01SR3★	I	3400–3600	40 Avg.	W-CDMA	48	16.1/3500	35.3	1.3	NI-400S-2S

⁽³⁾U = Unmatched; I = Input; I/O = Input/Output.

★New Product

RF ISM (Industrial, Scientific and Medical) and Broadcast

NXP RF industrial, scientific, medical (ISM) and broadcast RF power transistors are designed to simplify the use of solid-state RF in high-powered ISM applications at frequencies from 1 to 600 MHz. The devices serve applications in the 915, 1300 and 2450 MHz frequency bands and are well-suited for FM radio and VHF and UHF TV broadcast.

Table 1. Wideband GaN — 1–2500 MHz

Product	Frequency Band ⁽³⁾ MHz		P _{out} Watts	Test Signal	V _{DD} Volts	Gain (Typ)/Freq. dB/MHz	Eff. (Typ) %	θ _{JC} °C/W	Packaging
AFG24S100HR5★	I	1–2500	100 CW	CW	50	16.3/2500	63	0.86	NI-360H-2SB

Table 2. Wideband LDMOS — 1–2000 MHz

Product	Frequency Band ⁽³⁾ MHz		P _{out} Watts	Test Signal	V _{DD} Volts	Gain (Typ)/Freq. dB/MHz	Eff. (Typ) %	θ _{JC} °C/W	Packaging
MRFE6VS25NR1	U	1.8–2000	25 CW	CW	50	25.5/512	75.0	1.2	TO-270-2
MRFE6VS25GNR1	U	1.8–2000	25 CW	CW	50	25.5/512	75.0	1.2	TO-270G-2
MRFE6VS25LR5	U	1.8–2000	25 CW	CW	50	25.9/512	74.0	1.4	NI-360H-2L
MRFE6VP100HR5	U	1.8–2000	100 CW	CW	50	27.2/512	70.0	0.38	NI-780H-4L
MRFE6VP100HSR5	U	1.8–2000	100 CW	CW	50	27.2/512	70.0	0.38	NI-780S-4L

Table 3. ISM and Broadcast LDMOS — 1–600 MHz

Product	Frequency Band ⁽³⁾ MHz		P _{out} Watts	Test Signal	V _{DD} Volts	Gain (Typ)/Freq. dB/MHz	Eff. (Typ) %	θ _{JC} °C/W	Packaging
MRF6V2010NR1	U	1.8–600	10 CW	CW	50	23.9/220	62	3.0	TO-270-2
MRF6V2010GNR1	U	1.8–600	10 CW	CW	50	23.9/220	62	3.0	TO-270G-2
MRFE6VP5150NR1	U	1.8–600	150 CW	CW	50	26.3/230	72	0.21	TO-270WB-4
MRFE6VP5150GNR1	U	1.8–600	150 CW	CW	50	26.3/230	72	0.21	TO-270WBG-4
MRFE6VP5300NR1	U	1.8–600	300 CW	CW	50	25/230	70	0.22	TO-270WB-4
MRFE6VP5300GNR1	U	1.8–600	300 CW	CW	50	25/230	70	0.22	TO-270WBG-4
MRFE6VP6300HR3	U	1.8–600	300 CW	CW	50	25/130	80	0.19	NI-780H-4L
MRFE6VP6300HSR5	U	1.8–600	300 CW	CW	50	25/130	80	0.19	NI-780S-4L
MRFE6VP6300GSR5	U	1.8–600	300 CW	CW	50	25/130	80	0.19	NI-1230GS-4L
MRFE6VP5600HR6	U	1.8–600	600 CW	CW	50	24.6/230	75.2	0.12	NI-1230H-4S
MRFE6VP5600HSR5	U	1.8–600	600 CW	CW	50	24.6/230	75.2	0.12	NI-1230S-4S
MRFE6VP6600NR3	U	1.8–600	600 CW	CW	50	24/98	81	—	OM-780-4L
MRFE6VP6600GNR3	U	1.8–600	600 CW	CW	50	24/98	81	—	OM-780G-4L
MRFE6VP61K25HR5	U	1.8–600	1250 CW	CW	50	22.9/230	74.6	0.15	NI-1230H-4S
MRFE6VP61K25HR6	U	1.8–600	1250 CW	CW	50	22.9/230	74.6	0.15	NI-1230H-4S
MRFE6VP61K25HSR5	U	1.8–600	1250 CW	CW	50	22.9/230	74.6	0.15	NI-1230S-4S
MRFE6VP61K25GSR5	U	1.8–600	1250 CW	CW	50	22.9/230	74.6	0.15	NI-1230GS-4L
MRFE6VP61K25NR6	U	1.8–600	1250 CW	CW	50	22.5/230	72.3	0.06	OM-1230-4L
MRFE6VP61K25GNR6	U	1.8–600	1250 CW	CW	50	22.5/230	72.3	0.06	OM-1230G-4L
MRF1K50H ^(2a)	U	1.8–500	1500 CW	CW	50	22.5/230	74.6	—	NI-130H-4S
MRF1K50N ^(2b)	U	1.8–500	1500 CW	CW	50	22/230	74	—	OM-1230-4L
MRF1K50GN ^(2b)	U	1.8–500	1500 CW	CW	50	22/230	74	—	OM-1230G-4L

⁽²⁾To be introduced: a) 2Q16; b) 3Q16; c) 4Q16.

⁽³⁾U = Unmatched; I = Input; I/O = Input/Output.

★New Product

RF ISM (Industrial, Scientific and Medical) and Broadcast (continued)

Table 4. UHF Broadcast LDMOS — 470–860 MHz

Product	Frequency Band ⁽³⁾ MHz		P _{out} Watts	Test Signal	V _{DD} Volts	Gain (Typ)/Freq. dB/MHz	Eff. (Typ) %	θ _{JC} °C/W	Packaging
MRFE6S9060NR1	U	470–860	14 Avg.	N-CDMA	28	21.4/880	32.1	0.88	TO-270-2
MRF6V3090NR1	I	470–1215	18 Avg.	OFDM	50	22/860	28.5	0.79	TO-270WB-4
MRF6V3090NR5	I	470–1215	18 Avg.	OFDM	50	22/860	28.5	0.79	TO-270WB-4
MRF6V3090NBR1	I	470–1215	18 Avg.	OFDM	50	22/860	28.5	0.79	TO-272WB-4
MRF6V3090NBR5	I	470–1215	18 Avg.	OFDM	50	22/860	28.5	0.79	TO-272WB-4
MRF6VP3091NR1	I	470–1215	18 Avg.	OFDM	50	22/860	28.5	0.79	TO-270WB-4
MRF6VP3091NBR1	I	470–1215	18 Avg.	OFDM	50	22/860	28.5	0.79	TO-272WB-4
MRF6VP3450HR6	I	470–860	90 Avg.	OFDM	50	22.5/860	28	0.27	NI-1230H-4S
MRF6VP3450HR5	I	470–860	90 Avg.	OFDM	50	22.5/860	28	0.27	NI-1230H-4S
MRF6VP3450HSR5	I	470–860	90 Avg.	OFDM	50	22.5/860	28	0.27	NI-1230S-4S
MRFE6VP8600HR5	I	470–860	125 Avg.	OFDM	50	19.3/860	30	0.19	NI-1230H-4S
MRFE6VP8600HSR5	I	470–860	125 Avg.	OFDM	50	19.3/860	30	0.19	NI-1230S-4S
MRFE8VP8600HR5	I	470–860	140 Avg.	OFDM	50	20/810	34	0.16	NI-1230H-4S

Table 5. ISM LDMOS — 700–1300 MHz

Product	Frequency Band ⁽³⁾ MHz		P _{out} Watts	Test Signal	V _{DD} Volts	Gain (Typ)/Freq. dB/MHz	Eff. (Typ) %	θ _{JC} °C/W	Packaging
MRFE6S9060NR1	U	470–860	14 Avg.	N-CDMA	28	21.4/880	32.1	0.88	TO-270-2
MRF8VP13350NR3	I	700–1300	350 CW	CW	50	20.7/915	67.5	0.24	OM-780-4L
MRF8VP13350GNR3	I	700–1300	350 CW	CW	50	20.7/915	67.5	0.24	OM-780G-4L

Table 6. ISM LDMOS — 2400–2500 MHz

Product	Frequency Band ⁽³⁾ MHz		P _{out} Watts	Test Signal	V _{DD} Volts	Gain (Typ)/Freq. dB/MHz	Eff. (Typ) %	θ _{JC} °C/W	Packaging
MW7IC2425GNR1	I/O	2450	25 CW	CW	28	27.7/2450	43.8	1.2	TO-270WBG-16
MW7IC2425NBR1	I/O	2450	25 CW	CW	28	27.7/2450	43.8	1.2	TO-272WB-16
MRF6S24140HSR3	I/O	2450	140 CW	CW	28	13.2/2450	45	0.29	NI-880S-2L
MRF7S24250NR3	I/O	2400–2500	250 CW	CW	32	15.9/2450	59	0.26	OM-780-2L
MRF24300NR3★	I/O	2400–2500	300 CW	CW	32	13.1/2450	60.5	0.24	OM-780-2L

⁽³⁾U = Unmatched; I = Input; I/O = Input/Output.

★New Product

RF Mobile Radio and General Purpose Drivers

NXP RF 7.5 and 12.5 V transistors are designed for 2-way handheld and vehicle radios. The broadband performance of the devices makes them ideal as general purpose drivers for ISM and broadcast applications below 1 GHz.

Table 1. 7–12 V LDMOS — 1–1000 MHz

Product	Frequency Band ⁽³⁾ MHz		P _{out} Watts	Test Signal	V _{DD} Volts	Gain (Typ)/Freq. dB/MHz	Eff. (Typ) %	θ _{JC} °C/W	Packaging
AFIC901NT1★	U	1.8–1000	1 CW	CW	7.5	31.2/520	73	9.4	QFN 4 × 4, 24L
AFT05MS003NT1★	U	1.8–941	3 CW	CW	7.5	20.8/520	68.3	4.1	SOT-89
AFT05MS004NT1	U	1.8–941	4 CW	CW	7.5	20.9/520	74.9	4.4	SOT-89
AFM906 ^(2b)	U	136–941	6 CW	CW	7.5	20.3/520	70.8	—	DFN 4 × 6
AFT05MS006NT1	U	136–941	6 CW	CW	7.5	18.3/520	73	1	PLD-1.5W
AFT09MS007NT1	U	136–941	7 CW	CW	7.5	15.2/870	71	1.1	PLD-1.5W
AFT09MS015NT1	U	136–941	16 CW	CW	12.5	17.2/941	77	1.0	PLD-1.5W
AFT05MS031NR1	U	136–520	31 CW	CW	13.6/12.5	17.7/520	71.0	0.67	TO-270-2
AFT05MS031GNR1	U	136–520	31 CW	CW	13.6/12.5	17.7/520	71.0	0.67	TO-270G-2
AFT09MS031NR1	U	764–941	31 CW	CW	13.6/12.5	17.2/870	71.0	0.63	TO-270-2
AFT09MS031GNR1	U	764–941	31 CW	CW	13.6/12.5	17.2/870	71.0	0.63	TO-270G-2
AFT09MP055NR1	U	764–941	55 CW	CW	12.5	17.5/870	69	0.32	TO-270WB-4
AFT09MP055GNR1	U	764–941	55 CW	CW	12.5	17.5/870	69	0.32	TO-270WBG-4
AFT05MP075NR1	U	136–520	70 CW	CW	12.5	18.5/520	68.5	0.29	TO-270WB-4
AFT05MP075GNR1	U	136–520	70 CW	CW	12.5	18.5/520	68.5	0.29	TO-270WBG-4
MD8IC970NR1	I/O	850–940	35 Avg.	2-Tone	28	32.6/940	42.1	0.6	TO-270WBL-16
MD8IC970GNR1	I/O	850–940	35 Avg.	2-Tone	28	32.6/940	42.1	0.6	TO-270WBLG-16
MRFE6S9060NR1	U	470–860	14 Avg.	N-CDMA	28	21.4/880	32.1	0.88	TO-270-2
MRF8VP13350NR3	I	700–1300	350 CW	CW	50	20.7/915	67.5	0.24	OM-780-4L
MRF8VP13350GNR3	I	700–1300	350 CW	CW	50	20.7/915	67.5	0.24	OM-780G-4L

⁽²⁾To be introduced: a) 2Q16; b) 3Q16; c) 4Q16.

⁽³⁾U = Unmatched; I = Input; I/O = Input/Output.

★New Product

RF Military

NXP RF GaN and LDMOS technologies are ideally suited for military applications such as battlefield communications, primary radar covering HF, VHF, UHF, L-Band, S-Band, and avionics (such as IFF transponders) and electronic warfare jamming. The high power and high-gain performance of these devices make them ideal for common-source amplifier applications under demanding conditions.

Table 1. General Purpose Driver ICs

Product	Frequency Band ⁽³⁾ MHz		P _{out} Watts	Test Signal	V _{DD} Volts	Gain (Typ)/Freq. dB/MHz	Eff. (Typ) %	θ _{JC} °C/W	Packaging
MMRF2005NR1	I/O	728–960	3.2 Avg.	W-CDMA	28	35.9/940	16.5	1.6	TO-270WB-16
MMRF2005GNR1	I/O	728–960	3.2 Avg.	W-CDMA	28	35.9/940	16.5	1.6	TO-270WBG-16
MMRF2006NT1	I	1805–2170	20 Avg.	W-CDMA	28	32.6/2140	50	1.9	PQFN 8 × 8
MMRF2004NBR1	I/O	2500–2700	25 Avg.	WiMAX	28	28.5/2700	36	1.4	TO-272WB-16
MMRF2007NR1	I/O	136–940	35 Avg.	2-Tone	28	32.6/940	42.1	0.6	TO-270WBL-16
MMRF2007GNR1	I/O	136–940	35 Avg.	2-Tone	28	32.6/940	42.1	0.6	TO-270WBLG-16

Table 2. General Purpose Driver Transistors

Product	Frequency Band ⁽³⁾ MHz		P _{out} Watts	Test Signal	V _{DD} Volts	Gain (Typ)/Freq. dB/MHz	Eff. (Typ) %	θ _{JC} °C/W	Packaging
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28 Volt LDMOS

MMRF1014NT1	U	1–2000	4 Avg.	2-Tone	28	18/1960	43	8.8	PLD-1.5
MMRF1015NR1	U	450–1500	10 Avg.	2-Tone	28	18/960	40	2.85	TO-270-2
MMRF1015GNR1	U	450–1500	10 Avg.	2-Tone	28	18/960	40	2.85	TO-270G-2
MMRF1004NR1	I	2110–2170	10 PEP	2-Tone	28	15.5/2170	36	2.3	TO-270-2
MMRF1004GNR1	I	2110–2170	10 PEP	2-Tone	28	15.5/2170	36	2.3	TO-270G-2
MMRF1315NR1	I/O	500–1000	60 CW	CW	28	20/960	63	0.77	TO-270-2
MMRF1017NR3	I/O	720–960	80 Avg.	W-CDMA	28	20.0/960	36.1	0.31	OM-780-2L

50 Volt LDMOS

MMRF1012NR1	U	10–450	10 CW	CW	50	23.9/220	62	3	TO-270-2
MMRF1304LR5	U	To 2000	25 CW	CW	50	26/512	75	1.4	NI-360-2
MMRF1304NR1	U	To 2000	25 CW	CW	50	25.5/512	74.7	1.2	TO-270-2
MMRF1304GNR1	U	To 2000	25 CW	CW	50	25.5/512	74.7	1.2	TO-270G-2
MMRF1305HR5	U	To 2000	100 CW	CW	50	27.2/512	70	0.38	NI-780H-4L
MMRF1305HSR5	U	To 2000	100 CW	CW	50	27.2/512	70	0.38	NI-780S-4L
MMRF1316NR1	I/O	1.8–600	300 CW	CW	50	25/230	70	0.22	TO-270WB-4
MMRF1318NR1	U	10–600	300 CW	CW	50	22/450	60	0.24	TO-270WB-4

Table 3. Radar

Product	Frequency Band ⁽³⁾ MHz		P _{out} Watts	Test Signal	V _{DD} Volts	Gain (Typ)/Freq. dB/MHz	Eff. (Typ) %	θ _{JC} °C/W	Packaging
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HF, VHF and UHF Radar

MMRF1012NR1	U	10–450	10 CW	CW	50	23.9/220	62	3	TO-270-2
MMRF1304LR5	U	To 2000	25 CW	CW	50	26/512	75	1.4	NI-360-2
MMRF1304NR1	U	To 2000	25 CW	CW	50	25.5/512	74.7	1.2	TO-270-2
MMRF1304GNR1	U	To 2000	25 CW	CW	50	25.5/512	74.7	1.2	TO-270G-2
MMRF1315NR1	I/O	500–1000	60 CW	CW	28	20/960	63	0.77	TO-270-2
MMRF1305HR5	U	To 2000	100 CW	CW	50	27.2/512	70	0.38	NI-780H-4L
MMRF1305HSR5	U	To 2000	100 CW	CW	50	27.2/512	70	0.38	NI-780S-4L
MMRF1020-04NR3	I	720–960	100 Avg.	W-CDMA	48	19.5/920	48.5 ⁽⁴⁾	0.45	OM-780-4L
MMRF1020-04GNR3	I	720–961	100 Avg.	W-CDMA	48	19.5/920	48.5 ⁽⁴⁾	0.45	OM-780G-4L
MMRF1311HR5★	I	470–860	140 Avg.	OFDM	50	20/810	34	0.16	NI-1230H-4S
MMRF1310HR5	U	To 600	300 CW	CW	50	25.0/300	80.0	0.19	NI-780H-4L
MMRF1310HSR5	U	To 600	300 CW	CW	50	25.0/300	80.0	0.19	NI-780S-4L

⁽³⁾U = Unmatched; I = Input; I/O = Input/Output.

⁽⁴⁾In Doherty circuit.

★New Product

RF Military (continued)

Table 3. Radar (continued)

Product	Frequency Band ⁽³⁾ MHz	P _{out} Watts	Test Signal	V _{DD} Volts	Gain (Typ)/Freq. dB/MHz	Eff. (Typ) %	θ _{JC} °C/W	Packaging
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HF, VHF and UHF Radar (continued)

MMRF1316NR1	I/O	1.8–600	300 CW	CW	50	25/230	70	0.22	TO-270WB-4
MMRF1318NR1	U	10–600	300 CW	CW	50	22/450	60	0.24	TO-270WB-4
MMRF1016HR5	U	To 500	600 Peak	OFDM	50	25/225	59	0.2	NI-1230H-4S
MMRF1308HR5	U	To 600	600 CW	CW	50	24.6/230	75.2	0.12	NI-1230H-4S
MMRF1308HSR5	U	To 600	600 CW	CW	50	24.6/230	75.2	0.12	NI-1230S-4S
MMRF1006HR5	U	10–500	1000 Peak	Pulse	50	20/450	64	0.03	NI-1230H-4S
MMRF1006HSR5	U	10–500	1000 Peak	Pulse	50	20/450	64	0.03	NI-1230S-4S
MMRF1306HR5	U	1.8–600	1250 CW	CW	50	22.9/230	74.6	0.15	NI-1230H-4S
MMRF1306HSR5	U	1.8–600	1250 CW	CW	50	22.9/230	74.6	0.15	NI-1230S-4S

L-Band Radar

MMRF1019NR4	I/O	960–1400	10 Peak	Pulse	50	25/1090	69	1.6	PLD-1.5
MMRF1304LR5	U	To 2000	25 CW	CW	50	26/512	75	1.4	NI-360-2
MMRF1304NR1	U	To 2000	25 CW	CW	50	25.5/512	74.7	1.2	TO-270-2
MMRF1304GNR1	U	To 2000	25 CW	CW	50	25.5/512	74.7	1.2	TO-270G-2
MMRF1305HR5	U	To 2000	100 CW	CW	50	27.2/512	70	0.38	NI-780H-4L
MMRF1305HSR5	U	To 2000	100 CW	CW	50	27.2/512	70	0.38	NI-780S-4L
MMRF1005HR5	I	1300	250 Peak	Pulse	50	22.7/1300	57.0	0.07	NI-780H-2L
MMRF1005HSR5	I	1300	250 Peak	Pulse	50	22.7/1300	57.0	0.07	NI-780S-2L
MMRF2010NR1★	I	1030–1090	250 Peak	Pulse	50	32.5/1030	59.1	0.15	TO-270WB-14
MMRF2010GNR1★	I	1030–1090	250 Peak	Pulse	50	32.5/1030	59.1	0.15	TO-270WBG-14
MMRF1008HR5	I/O	960–1215	275 Peak	Pulse	50	20.3/1030	65.5	0.08	NI-780H-2L
MMRF1008HSR5	I/O	960–1215	275 Peak	Pulse	50	20.3/1030	65.5	0.08	NI-780S-2L
MMRF1008GHR5★	I/O	960–1215	275 Peak	Pulse	50	20.3/1030	65.5	0.08	NI-780GH-2L
MMRF1011HR5	I/O	1400	330 Peak	Pulse	50	18/1400	60.5	0.13	NI-780H-2L
MMRF1011HSR5	I/O	1400	330 Peak	Pulse	50	18/1400	60.5	0.13	NI-780S-2L
MMRF1009HR5	I/O	960–1215	500 Peak	Pulse	50	19.7/1030	62.0	0.044	NI-780H-2L
MMRF1009HSR5	I/O	960–1215	500 Peak	Pulse	50	19.7/1030	62.0	0.044	NI-780S-2L
MMRF1007HR5	I	965–1215	1000 Peak	Pulse	50	20/1030	56	0.02	NI-1230H-4S
MMRF1007HSR5	I	965–1215	1000 Peak	Pulse	50	20/1030	56	0.02	NI-1230S-4S
MMRF1314HR5★	I/O	1200–1400	1000 Peak	Pulse	52	15.5	46.5	0.018	NI-1230H-4S
MMRF1314HSR5★	I/O	1200–1400	1000 Peak	Pulse	52	15.5	46.5	0.018	NI-1230S-4S
MMRF1314GSR5★	I/O	1200–1400	1000 Peak	Pulse	52	15.5	46.5	0.018	NI-1230GS-4L
MMRF1312HR5★	I/O	900–1215	1200 Peak ⁽⁵⁾	Pulse	52	17.3	54	0.017	NI-1230H-4S
MMRF1312HSR5★	I/O	900–1215	1200 Peak ⁽⁵⁾	Pulse	52	17.3	54	0.017	NI-1230S-4S
MMRF1312GSR5★	I/O	900–1215	1200 Peak ⁽⁵⁾	Pulse	52	17.3	54	0.017	NI-1230GS-4L
MMRF1317HR5★	U	1030–1090	1500 Peak ⁽⁵⁾	Pulse	50	18.9/1030	56	0.019	NI-1230H-4S
MMRF1317HSR5★	U	1030–1090	1500 Peak ⁽⁵⁾	Pulse	50	18.9/1030	56	0.019	NI-1230S-4S

S-Band Radar

MMRF5300NR5★	I	2700–3500	60 Peak	Pulse	50	17/3500	61.5	0.52	OM-270-2
MMRF1013HR5	I/O	2700–2900	320 Peak	Pulse	30	13.3/2900	50.5	0.06	NI-1230H-4S
MMRF1013HSR5	I/O	2700–2900	320 Peak	Pulse	30	13.3/2900	50.5	0.06	NI-1230S-4S

⁽³⁾U = Unmatched; I = Input; I/O = Input/Output.

⁽⁵⁾P_{out} @ P3dB.

★New Product

RF Military (continued)

Table 4. Radio Communications

Product		Frequency Band ⁽³⁾ MHz	P _{out} Watts	Test Signal	V _{DD} Volts	Gain (Typ)/Freq. dB/MHz	Eff. (Typ) %	θ _{JC} °C/W	Packaging
28 Volt GaN									
MMRF5011N ^(2b)	I	1–3000	12 CW	CW	28	13/2500	40	—	OM-270-8
50 Volt GaN									
MMRF5013N ^(2b)	I	1–3000	12 CW	CW	50	15/2700	60	—	OM-270-8
MMRF5019N ^(2b)	I	1–3000	25 CW	CW	50	18/1500	40	—	OM-270-8
MMRF5023N ^(2b)	I	1–2700	63 CW	CW	50	16/2500	40	—	OM-270-2
MMRF5014HR5	I	1–2700	125 CW	CW	50	16/2500	64.2	0.86	NI-360H-2SB
MMRF5015NR5★	I	1–2700	125 CW	CW	50	16/2500	64.2	0.66	OM-270-2
7.5 Volt LDMOS									
MMRF1021NT1	U	136–941	7 CW	CW	7.5	15.2/870	71	1.1	PLD-1.5W
28 Volt LDMOS									
MMRF1024HSR5★	I/O	2496–2690	50 Avg.	W-CDMA	28	14.1/2590	44.6	0.42	NI-1230S-4L2L
MMRF1022HSR5★	I/O	2110–2170	63 Avg.	W-CDMA	28	16.2/2140	51.8	0.33	NI-1230S-4L2L
MMRF1023HSR5★	I/O	2300–2400	66 Avg.	W-CDMA	28	14.9/2350	46.7	0.25	NI-1230S-4L2L
MMRF1315NR1	I/O	500–1000	60 CW	CW	28	20/960	63	0.77	TO-270-2
50 Volt LDMOS — 1–600 MHz									
MMRF1012NR1	U	10–450	10 CW	CW	50	23.9/220	62	3	TO-270-2
MMRF1304LR5	U	To 2000	25 CW	CW	50	26/512	75	1.4	NI-360-2
MMRF1304NR1	U	To 2000	25 CW	CW	50	25.5/512	74.7	1.2	TO-270-2
MMRF1304GNR1	U	To 2000	25 CW	CW	50	25.5/512	74.7	1.2	TO-270G-2
MMRF1320NR1★	U	1.8–600	150 CW	CW	50	26.1/230	70.3	0.21	TO-270WB-4
MMRF1320GNR1★	U	1.8–600	150 CW	CW	50	26.1/230	70.3	0.21	TO-270WBG-4
MMRF1310HR5	U	To 600	300 CW	CW	50	25.0/300	80.0	0.19	NI-780H-4L
MMRF1310HSR5	U	To 600	300 CW	CW	50	25.0/300	80.0	0.19	NI-780S-4L
MMRF1318NR1	U	10–600	300 CW	CW	50	22/450	60	0.24	TO-270WB-4
MMRF1016HR5	U	To 500	600 Peak	OFDM	50	25/225	59	0.2	NI-1230H-4S
MMRF1308HR5	U	To 600	600 CW	CW	50	24.6/230	75.2	0.12	NI-1230H-4S
MMRF1308HSR5	U	To 600	600 CW	CW	50	24.6/230	75.2	0.12	NI-1230S-4S
MMRF1306HR5	U	1.8–600	1250 CW	CW	50	22.9/230	74.6	0.15	NI-1230H-4S
MMRF1306HSR5	U	1.8–600	1250 CW	CW	50	22.9/230	74.6	0.15	NI-1230S-4S
50 Volt LDMOS — 450–2000 MHz									
MMRF1304LR5	U	To 2000	25 CW	CW	50	26/512	75	1.4	NI-360-2
MMRF1304NR1	U	To 2000	25 CW	CW	50	25.5/512	74.7	1.2	TO-270-2
MMRF1304GNR1	U	To 2000	25 CW	CW	50	25.5/512	74.7	1.2	TO-270G-2
MMRF1018NR1	I	470–860	90 CW	CW	50	22.0/860	57	0.79	TO-270WB-4
MMRF1018NBR1	I	470–860	90 CW	CW	50	22.0/860	57	0.79	TO-272WB-4
MMRF1305HR5	U	To 2000	100 CW	CW	50	27.2/512	70	0.38	NI-780H-4L
MMRF1305HSR5	U	To 2000	100 CW	CW	50	27.2/512	70	0.38	NI-780S-4L
MMRF5021H ⁽¹⁾	I	1–2700	250 CW	CW	50	16/2500	58	—	NI-780H-4L
MMRF1020-04NR3	I	720–960	100 Avg.	W-CDMA	48	19.5/920	48.5 ⁽⁴⁾	0.45	OM-780-4L
MMRF1020-04GNR3	I	720–961	100 Avg.	W-CDMA	48	19.5/920	48.5 ⁽⁴⁾	0.45	OM-780G-4L

⁽¹⁾Product under development.

⁽²⁾To be introduced: a) 2Q16; b) 3Q16; c) 4Q16.

⁽³⁾U = Unmatched; I = Input; I/O = Input/Output.

⁽⁴⁾In Doherty circuit.

★New Product

RF Commercial Aerospace

The NXP RF commercial aerospace portfolio offers LDMOS solutions for avionics systems (ground-based and airborne) and L-Band and S-Band radar applications.

Table 1. Commercial Aerospace — L-Band LDMOS — 960-1400 MHz

Product		Frequency Band ⁽³⁾ MHz	P _{out} Watts	Test Signal	V _{DD} Volts	Gain (Typ)/Freq. dB/MHz	Eff. (Typ) %	θ _{JC} °C/W	Packaging
MRF6V10010NR4	I/O	960–1400	10 Peak	Pulse	50	25/1090	69	1.6	PLD-1.5
MRFE6VS25NR1	U	To 2000	25 CW	CW	50	25.5/512	75.0	1.2	TO-270-2
MRFE6VS25GNR1	U	To 2000	25 CW	CW	50	25.5/512	75.0	1.2	TO-270G-2
AFIC10275NR1	I	978–1090	250 Peak	Pulse	50	32.6/978	61	0.15	TO-270WB-14
AFIC10275GNR1	I	978–1090	250 Peak	Pulse	50	32.6/978	61	0.15	TO-270WBG-14
MRF6V12250HR5	I/O	960–1215	275 Peak	Pulse	50	20.3/1030	65.5	0.08	NI-780H-2L
MRF6V12250HSR5	I/O	960–1215	275 Peak	Pulse	50	20.3/1030	65.5	0.08	NI-780S-2L
MRF6V14300HR5	I/O	1200–1400	330 Peak	Pulse	50	18/1400	60.5	0.13	NI-780H-2L
MRF6V14300HSR5	I/O	1200–1400	330 Peak	Pulse	50	18/1400	60.5	0.13	NI-780S-2L
MRF6V12500HR5	I/O	965–1215	500 Peak	Pulse	50	19.7/1400	62	0.044	NI-780H-2L
MRF6V12500HSR5	I/O	965–1215	500 Peak	Pulse	50	19.7/1400	62	0.044	NI-780S-2L
MRF6V12500GSR5★	I/O	965–1215	500 Peak	Pulse	50	19.7/1400	62	0.044	NI-780GS-2L
AFV121KHR5★	I/O	960–1215	1000 Peak	Pulse	50	17.4/1090	52.2	0.017	NI-1230H-4S
AFV121KHSR5★	I/O	960–1215	1000 Peak	Pulse	50	17.4/1090	52.2	0.017	NI-1230S-4S
AFV121KGSR5★	I/O	960–1215	1000 Peak	Pulse	50	17.4/1090	52.2	0.017	NI-1230GS-4L
AFV141KHR5★	I/O	1200–1400	1000 Peak	Pulse	50	17.7/1090	52.1	0.018	NI-1230H-4S
AFV141KHSR5★	I/O	1200–1400	1000 Peak	Pulse	50	17.7/1400	52.1	0.018	NI-1230S-4S
AFV141KGSR5★	I/O	1200–1400	1000 Peak	Pulse	50	17.7/1400	52.1	0.018	NI-1230GS-4L

Table 2. Commercial Aerospace S-Band LDMOS — 2700-2900 MHz

Product		Frequency Band ⁽³⁾ MHz	P _{out} Watts	Test Signal	V _{DD} Volts	Gain (Typ)/Freq. dB/MHz	Eff. (Typ) %	θ _{JC} °C/W	Packaging
MRF8P29300HR6	I/O	2700–2900	320 Peak	Pulse	30	13.3/2900	50.5	0.06	NI-1230H-4S
MRF8P29300HSR6	I/O	2700–2900	320 Peak	Pulse	30	13.3/2900	50.5	0.06	NI-1230S-4S

⁽³⁾U = Unmatched; I = Input; I/O = Input/Output.

★New Product

RF Cooking

NXP is leading a transformation from legacy RF power vacuum device-based systems to long-lasting solid-state transistor-based systems for a wide variety of consumer and commercial cooking applications.

NXP solid-state solutions provide clean, efficient, controllable RF energy while minimizing equipment maintenance and downtime.

Table 1. RF Cooking — 915 MHz

Product	Frequency Band ⁽³⁾ MHz		P _{out} (Typ) Watts	Test Signal	V _{DD} Volts	Gain (Typ)/Freq. dB/MHz	Eff. (Typ) %	θ _{JC} °C/W	Packaging
MHT1002NR3	I	915	357 CW	CW	48	20.7/915	66.9	0.24	OM-780-4L
MHT1002GNR3	I	915	357 CW	CW	48	20.7/915	66.9	0.24	OM-780G-4L
MHT2001NT1★	I	915	175 CW	CW	50	33.9/915	64.8	0.58	TO-270WB-14

Table 2. RF Cooking — 2450 MHz

Product	Frequency Band ⁽³⁾ MHz		P _{out} (Typ) Watts	Test Signal	V _{DD} Volts	Gain (Typ)/Freq. dB/MHz	Eff. (Typ) %	θ _{JC} °C/W	Packaging
MHT1000HR5	I/O	2400–2500	140 CW	CW	28	13.2/2450	45	0.29	NI-880H-2L
MHT1001HR5	I/O	2400–2500	190 CW	CW	28	13.2/2450	46.2	0.22	NI-1230H-4S
MHT1003NR3	I/O	2400–2500	250 CW	CW	32	15.9/2450	59	0.26	OM-780-2L
MHE1003N	I/O	2400–2500	220 CW	CW	26	14.1/2450	62	0.24	OM-780-2L
MHT1004NR3★	I/O	2400–2500	300 CW	CW	32	15.2/2450	57.9	0.24	OM-780-2L
MHT1004GNR3★	I/O	2400–2500	300 CW	CW	32	15.2/2450	57.9	0.24	OM-780G-2L
MHT1006NT1	U	728–2700	10 CW	CW	28	19.8/2400	55.1	3.7	PLD-1.5W
MHT1008NT1★	U	2400–2500	12.5 CW	CW	28	18.6/2450	56.3	2.6	PLD-1.5W
MHT2000NR1	I/O	2400–2500	25 CW	CW	28	27.7/2450	43.8	1.2	TO-270WB-16
MHT2000GNR1	I/O	2400–2500	25 CW	CW	28	27.7/2450	43.8	1.2	TO-270WBG-16

⁽³⁾U = Unmatched; I = Input; I/O = Input/Output.

★New Product

RF Low Power

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RF General Purpose Amplifiers

NXP's portfolio of GPAs combine the right level of gain, linearity, noise and power consumption specifications to meet the industry's most demanding applications. From high gain, small-signal applications found in consumer and commercial to industrial applications, NXP GPAs provide an excellent solution.

Table 1. General Purpose Amplifiers — InGaP HBT, GaAs E-pHEMT

Product	Frequency Band MHz	Supply Voltage (Typ) Volts	Supply Current (Typ) mA	Small Signal Gain (Typ)/Freq. dB/MHz	P1dB (Typ)/Freq. dBm/MHz	3rd Order Output Intercept (Typ)/Freq. dBm/MHz	NF (Typ)/Freq. dB/MHz	θ_{JC} °C/W	Packaging
MMG38151BT1	0–6000	5	47	17.1/3800	13.4/3800	25/3800	3.5/3800	55	SOT-89
MMG3012NT1	0–6000	5	70	19/900	18.5/900	34/900	3.8/900	85	SOT-89
MMG3015NT1	0–6000	5	95	15.5/900	20.5/900	36/900	5.6/900	41.5	SOT-89
MMG3H21NT1	0–6000	5	90	19.3/900	20.5/900	37/900	5.5/900	38.6	SOT-89
MMG20241HT1	450–3800	5	78	17.8/2655	23.9/2655	38/2655	2.1/2655	57	SOT-89
MMG3003NT1	40–3600	6.2	180	20/900	24/900	40.5/900	4/900	31.6	SOT-89
MMG15241HT1	500–2800	5	85	15.9/2140	24/2140	39.4/2140	1.6/2140	59	SOT-89
MMG3014NT1	40–4000	5	135	19.5/900	25/900	40.5/900	5.7/900	27.4	SOT-89
MMG3004NT1	400–2200	5	250	17/2140	27/2140	44/2140	3.4/2140	23.2	PQFN 5 × 5
MMG30721BT1★	900–4300	5	134	17.5/2140	26.9/2140	45.8/2140	3.8/2140	33	SOT-89
MMG3005NT1	800–2200	5	480	15/2140	30/2140	47/2140	5/2140	21.5	PQFN 5 × 5
MMG30301B ^(2a)	1800–3800	5	260	16.9/2140	30.1/2140	42/2140	—	—	SOT-89
MMG3006NT1	400–2400	5	850	17.5/900	33/900	49/900	6.6/900	7.8	QFN 4 × 4

⁽²⁾To be introduced: a) 2Q16; b) 3Q16; c) 4Q16.

★New Product

RF Linear Amplifiers

Table 1. Linear Amplifiers — InGaP HBT

Product	Frequency Band MHz	Supply Voltage (Typ) Volts	Supply Current (Typ) mA	Small Signal Gain (Typ)/Freq. dB/MHz	P1dB (Typ)/Freq. dBm/MHz	3rd Order Output Intercept (Typ)/Freq. dBm/MHz	Packaging
MMZ09312BT1	400–1000	3–5	74	31.5/900	29.6/900	42/900	QFN 3 × 3
MMA20312BVT1	1800–2200	3–5	70	27.2/2140	30.5/2140	44.5/2140	QFN 3 × 3
MMA20312BT1	1800–2200	5	70	27.2/2140	30.5/2140	44.5/2140	QFN 3 × 3
MMA25312BT1	2300–2700	3–5	124	26/2500	31/2500	40/2500	QFN 3 × 3
MMZ09332BT1★	130–1000	3–5	108	30.5/760	32.8/760	43/760	QFN 3 × 3
MMZ25332BT1	1500–2800	3–5	390	26.5/2500	33/2500	48/2500	QFN 3 × 3
MMZ25332B4T1★	1500–2700	3–5	392	26.5/2500	33/2500	48/2500	QFN 4 × 4
MMZ25333BT1	1500–2700	5	265	43/2600	32/2600	42.8/2600	QFN 4 × 4
MMZ27333BT1★	1500–2700	5	430	35.8/2600	32.2/2600	45/2600	QFN 4 × 4
MMZ38333B ^(2b)	3400–3800	5	330	36/3600	33/3600	—	QFN 4 × 4

⁽²⁾To be introduced: a) 2Q16; b) 3Q16; c) 4Q16.

★New Product

RF Low Noise Amplifiers

Table 1. Low Noise Amplifiers — GaAs E-pHEMT

Product	Frequency Band MHz	Supply Voltage (Typ) Volts	Supply Current (Typ) mA	Small Signal Gain (Typ)/Freq. dB/MHz	P1dB (Typ)/Freq. dBm/MHz	3rd Order Output Intercept (Typ)/Freq. dBm/MHz	NF (Typ)/Freq. dB/MHz	θ_{JC} °C/W	Packaging
MML20211HT1	1400–2800	5	60	18.6/2140	21.3/2140	33/2140	0.65/2140	43.4	DFN 2 × 2
MML09211HT1	400–1400	5	60	21.3/900	22/900	32.6/900	0.52/900	37.5	DFN 2 × 2
MML09212HT1	400–1400	5	150	37.5/900	22.8/900	37/900	0.52/900	37	QFN 3 × 3
MML25231HT1★	1000–4000	5	60	15.2/2500	22.5/2500	35.2/2500	0.54/2500	134	DFN 2 × 2
MMG20241HT1	450–3800	5	78	17.8/2655	23.9/2655	38/2655	2.1/2655	57	SOT-89
MMG15241HT1	500–2800	5	85	15.9/2140	24/2140	39.4/2140	1.6/2140	59	SOT-89
MML20242HT1	1400–2800	5	160	34/1950	24/1950	39.5/1950	0.59/1950	40	QFN 3 × 3
MML09231HT1	700–1400	5	55	17.2/900	24.5/900	37.4/900	0.36/900	77	DFN 2 × 2

Table 2. Low Noise and General Purpose Amplifiers — SiGe BiCMOS

Product	RF Frequency Range MHz	Supply Voltage Range Vdc	Supply Current (Typ) mA	Standby Current (Typ) μ A	Small Signal Gain (Typ)/Freq. dB/MHz	Output IP3 (Typ)/Freq. dBm/MHz	NF (Typ)/Freq. dB/MHz	Packaging	System Applicability
MBC13916NT1	100 to 2500	2.1 to 5.0	4.7	—	19/900 11.5/1900	11/900 5.5/1900	1.25/900 2.1/1900	SOT-343R	General Purpose for Smart Metering, RKE, VCOs
MBC13917EP	100 to 2500	2.1 to 3.3	4.7	—	27/434 24/900	10.9/434 12.4/900	2.3/434 1.2/900	MLPD-6	General Purpose for Smart Metering, RKE, VCOs
MBC13720NT1	400 to 2500	2.3 to 3.0	5 Low IP3 11 High IP3	2	20/900 14/1900	22/900 24/1900	1.2/900 1.38/1900	SOT-363	Smart Metering, RKE, TPMS, UHF, ISM, CDMA, PCS
MC13850EP	400 to 2500	2.3 to 3.0	4.7 Low IP3 9.9 High IP3	2	24.1/470 15/1960	16.4/470 24.5/1960	1.33/470 1.75/1960	MLPD-8	Smart Metering, RKE, TPMS, Cellular, UHF, ISM, CDMA, PCS
MC13851EP	1000 to 2500	2.3 to 3.0	3.8	4	18.9/1575 18/1960	15.9/1575 17.1/1960	1.27/1575 1.35/1960	MLPD-8	W-CDMA, PCS, GPS, Cellular, 2400 ISM
MC13852EP	400 to 1000	2.3 to 3.0	4.4	4	19.3/434 18.2/900	7.9/434 13.1/900	1.6/434 1.18/900	MLPD-8	Smart Metering, RKE, Cellular, UHF, ISM, CDMA, PCS

★New Product

RF Control Circuits

Table 1. ADAM (Advanced Doherty Alignment Module)

Advanced Doherty alignment module (ADAM) is an innovative class of highly integrated GaAs MMIC control circuits designed specifically to optimize the performance of today's Doherty amplifiers. When combined with Airfast power transistors, these sophisticated devices improve manufacturing yields and power added efficiency and are available for frequency bands spanning from 700 MHz to 2700 MHz.

Product	Frequency Band MHz	Test Freq. MHz	Insertion Loss dB	Atten. Step Size dB	Atten. Control Range dB	Phase Step Size (°)	Phase Control Range (°)	P _{in} (Max) dBm	IIP3 dBm	Supply Voltage Volts	Supply Current mA	Packaging
MMDS09254HT1★	700–1000	900	5.5	0.5	7.5	7	49	25	40	5	12	QFN 6 × 6
MMDS20254HT1	1800–2200	2140	5.5	0.5	7.5	7	49	25	40	5	12	QFN 6 × 6
MMDS25254HT1	2300–2700	2650	5.5	0.5	7.5	7	49	25	40	5	12	QFN 6 × 6

Table 2. Digital Step Attenuator

The MMT20303H is an integrated 3-bit attenuator with 1 dB step size, is controlled via a 3-bit parallel interface and operates using a 3 to 5 V supply. This device is suitable for 3G/4G base station and small cell transmitter applications requiring a band of operation across 50–4000 MHz.

Product	Frequency Band MHz	Test Freq. MHz	Insertion Loss dB	Atten. Step Size dB	Atten. Accuracy (Max) dB	Atten. Max. Range dB	P _{in} (Max) dBm	IIP3 dBm	Supply Voltage Volts	Packaging
MMT20303HT1★	50–4000	900	0.7	1	0.25	7	30	50	3–5	QFN 3 × 3

Table 3. RF High Power Switch

The AFS4040 is an integrated single-pole, double-throw RF switch designed for wireless infrastructure RF control and general high power RF switching applications. It consists of a high power RF FET switch operating from a single 3 or 5 V supply and a TTL-level T/R control. It features low power consumption with minimal insertion loss compared to existing solutions.

Product	Frequency Band MHz	Test Freq. MHz	TX IL dB	Isolation dB	P1dB (Typ) dBm	Supply Voltage Volts	Packaging
AFS4040 ^(2c)	300–4000	1800	0.35	40	52	5	QFN 4 × 4, 24L

⁽²⁾To be introduced: a) 2Q16; b) 3Q16; c) 4Q16.

★New Product

RF GaAs Linear Power Transistors

NXP GaAs power transistors are made using an InGaAs pHEMT or HFET epitaxial structure for superior RF efficiency and linearity. The FETs listed in this section are designed for operation in base station infrastructure RF power amplifiers and are grouped according to frequency range and type of application.

Table 1. Linear Transistors — To 5000 MHz — Class AB

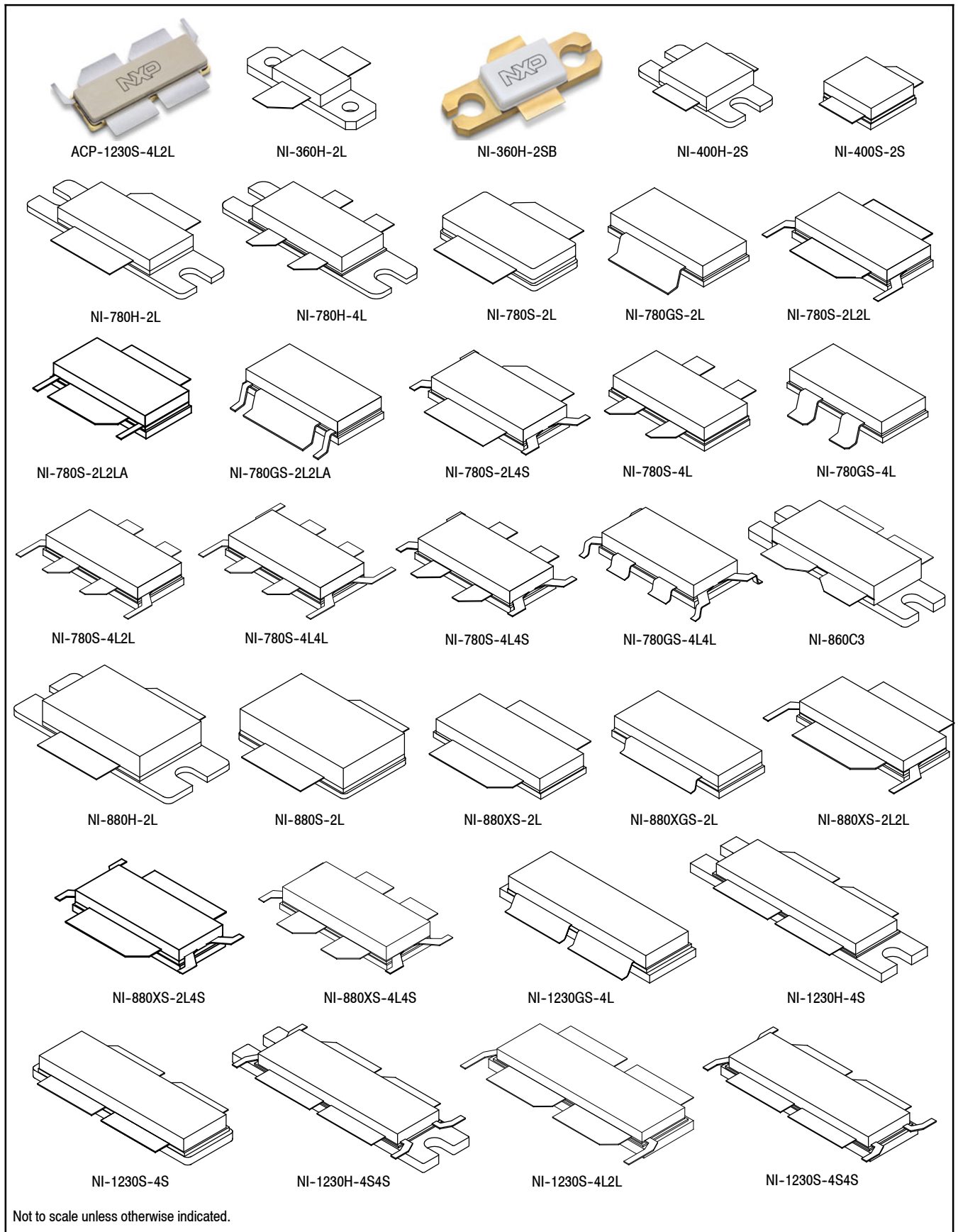
Product	Frequency Band ⁽³⁾ MHz		P _{out} (Typ)/Freq Watts/MHz	Test Signal	V _{DD} Volts	Gain (Typ)/Freq. dB/MHz	Eff. (Typ)/Freq. %/MHz	θ _{JC} °C/W	Packaging
MRFG35003N6AT1	U	500–5000	0.45 Avg./ 3550	W-CDMA ⁽⁶⁾	6	10/3550	27/3550	5.9	PLD-1.5
MRFG35005ANT1	U	500–5000	0.45 Avg./ 3550	W-CDMA ⁽⁶⁾	12	11/3550	26/3550	13.7	PLD-1.5
MRFG35010ANT1	U	500–5000	1 Avg./ 3550	W-CDMA ⁽⁶⁾	12	10/3550	25/3550	6.5	PLD-1.5

⁽³⁾U = Unmatched; I = Input; I/O = Input/Output.

⁽⁶⁾Peak-to-Average Power Ratio = 8.5 dB.

RF Packages

AIR CAVITY PACKAGES



OVER-MOLDED PLASTIC PACKAGES

DFN 2 × 2

SCALE 3:1

DFN 4 × 6

MLPD-6

SCALE 2:1

MLPD-8

SCALE 2:1

OM-1230-4L

OM-1230G-4L

OM-1230-4L2L

OM-270-2

OM-270-8

OM-780-2L

OM-780G-2L

OM-780-2L2L

OM-1230-4L2S

OM-780-4L

OM-780G-4L

PLD-1.5

PLD-1.5W

PQFN 8 × 8

PQFN 5 × 5

QFN 3 × 3

SCALE 3:1

QFN 4 × 4, 16L

SCALE 2:1

QFN 4 × 4, 24L

SCALE 2:1

QFN 6 × 6

SOT-343R

SCALE 3:1

SOT-363

SCALE 2:1

SOT-89
(98ASA00241D)

SCALE 2:1

SOT-89
(98ASA10586D)

TO-270-2

TO-270G-2

TO-270WB-4

TO-270WBG-4

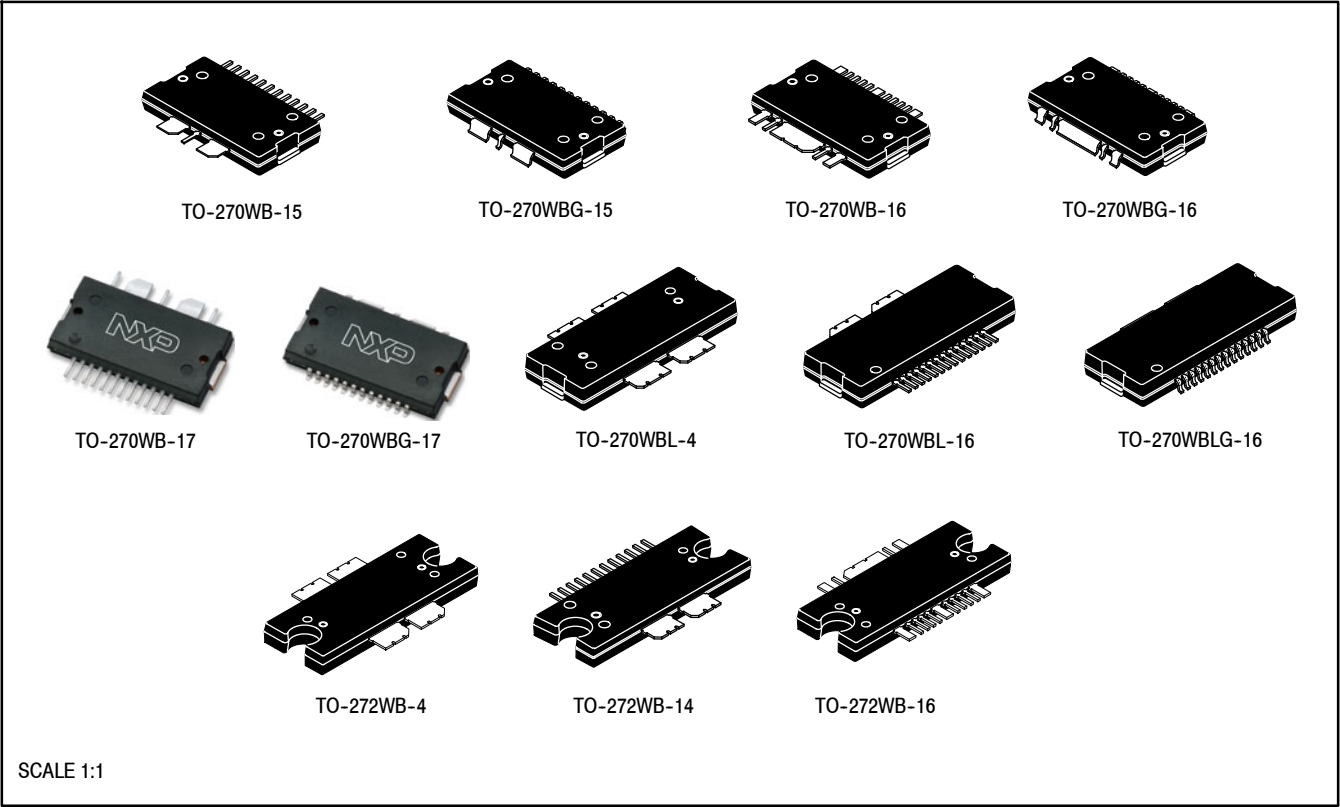
TO-270WB-6A

TO-270WB-14

TO-270WBG-14

Not to scale unless otherwise indicated.

OVER-MOLDED PLASTIC PACKAGES (continued)



RF Tape and Reel Specifications

RF EMBOSSED TAPE AND REEL ORDERING INFORMATION

Package	Tape Width (mm)	Pitch mm (inch)	Reel Size mm (inch)	Devices Per Reel and Minimum Order Quantity	Device Suffix
DFN 2 × 2	12	8.0 ± 0.1 (.315 ± .004)	178 (7)	1,000	T1
NI-360H-2SB	32	24.0 ± 0.1 (.945 ± .004)	330 (13)	50	R5
NI-400H-2S	32	32.0 ± 0.1 (1.26 ± .004)	330 (13)	250	R3
NI-400S-2S	32	32.0 ± 0.1 (1.26 ± .004)	330 (13)	250	R3
NI-780H-2L	56	32.0 ± 0.1 (1.26 ± .004)	330 (13)	250	R3
NI-780S-2L	56	32.0 ± 0.1 (1.26 ± .004)	330 (13)	250	R3
NI-780GS-2L	56	32.0 ± 0.1 (1.26 ± .004)	330 (13)	250	R3
NI-780H-4L	56	32.0 ± 0.1 (1.26 ± .004)	330 (13)	250	R3
NI-780S-4L	32	28.0 ± 0.1 (1.10 ± .004)	330 (13)	250	R3
NI-780GS-4L	32	28.0 ± 0.1 (1.10 ± .004)	330 (13)	250	R3
NI-780S-2L2L	44	28.0 ± 0.1 (1.10 ± .004)	330 (13)	250	R3
NI-780S-2L2LA	44	28.0 ± 0.1 (1.10 ± .004)	330 (13)	250	R3
NI-780GS-2L2LA	44	28.0 ± 0.1 (1.10 ± .004)	330 (13)	250	R3
NI-780S-2L4S	44	28.0 ± 0.1 (1.10 ± .004)	330 (13)	250	R3
NI-780S-4L2L	44	28.0 ± 0.1 (1.10 ± .004)	330 (13)	250	R3
NI-780S-4L4L	44	28.0 ± 0.1 (1.10 ± .004)	330 (13)	250	R3
NI-780GS-4L4L	44	28.0 ± 0.1 (1.10 ± .004)	330 (13)	250	R3
NI-780S-4L4S	44	28.0 ± 0.1 (1.10 ± .004)	330 (13)	250	R3
NI-860	56	28.0 ± 0.1 (1.10 ± .004)	330 (13)	250	R3
	56	28.0 ± 0.1 (1.10 ± .004)	330 (13)	50	R5
NI-880H-2L	56	32.0 ± 0.1 (1.26 ± .004)	330 (13)	250	R3
NI-880S-2L	56	32.0 ± 0.1 (1.26 ± .004)	330 (13)	250	R3
NI-880XS-2L	56	28.0 ± 0.1 (1.10 ± .004)	330 (13)	250	R3
NI-880XGS-2L	56	28.0 ± 0.1 (1.10 ± .004)	330 (13)	250	R3
NI-880XS-2L4S	56	28.0 ± 0.1 (1.10 ± .004)	330 (13)	250	R3
NI-880XS-4L4S	56	28.0 ± 0.1 (1.10 ± .004)	330 (13)	250	R3
NI-1230H-4S	56	32.0 ± 0.1 (1.26 ± .004)	330 (13)	150	R6
	56	32.0 ± 0.1 (1.26 ± .004)	330 (13)	50	R5
NI-1230S-4S	56	32.0 ± 0.1 (1.26 ± .004)	330 (13)	150	R6
	56	32.0 ± 0.1 (1.26 ± .004)	330 (13)	50	R5
NI-1230S-4L2L	56	32.0 ± 0.1 (1.26 ± .004)	330 (13)	150	R6
NI-1230GS-4L	56	32.0 ± 0.1 (1.26 ± .004)	330 (13)	150	R6
NI-1230H-4S4S	56	32.0 ± 0.1 (1.26 ± .004)	330 (13)	150	R6
NI-1230S-4S4S	56	32.0 ± 0.1 (1.26 ± .004)	330 (13)	150	R6
OM-780-2L	32	28.0 ± 0.1 (1.10 ± .004)	330 (13)	250	R3
OM-780G-2L	32	28.0 ± 0.1 (1.10 ± .004)	330 (13)	250	R3
OM-780-2L2L	32	28.0 ± 0.1 (1.10 ± .004)	330 (13)	250	R3
OM-780-4L	32	28.0 ± 0.1 (1.10 ± .004)	330 (13)	250	R3
OM-780G-4L	32	28.0 ± 0.1 (1.10 ± .004)	330 (13)	250	R3
OM-780-4L2L	32	28.0 ± 0.1 (1.10 ± .004)	330 (13)	250	R3
OM-880X-2L2L	56	28.0 ± 0.1 (1.10 ± .004)	330 (13)	250	R3
OM-1230-4L2L	56	32.0 ± 0.1 (1.26 ± .004)	330 (13)	150	R6
OM-1230-4L2S	56	32.0 ± 0.1 (1.26 ± .004)	330 (13)	150	R6

(continued)

RF Tape and Reel Specifications (continued)

RF EMBOSSED TAPE AND REEL ORDERING INFORMATION (continued)

Package	Tape Width (mm)	Pitch mm (inch)	Reel Size mm (inch)	Devices Per Reel and Minimum Order Quantity	Device Suffix
OM-1230-4L	56	32.0 ± 0.1 (1.26 ± .004)	330 (13)	150	R6
OM-1230G-4L	56	32.0 ± 0.1 (1.26 ± .004)	330 (13)	150	R6
OM-270-2	24	16.0 ± 0.1 (.631 ± .004)	178 (7)	50	R5
PLD-1.5	16	8.0 ± 0.1 (.315 ± .004)	330 (7)	1,000	T1
	16	8.0 ± 0.1 (.315 ± .004)	330 (7)	100	R4
PLD-1.5W	16	8.0 ± 0.1 (.315 ± .004)	330 (7)	1,000	T1
	16	8.0 ± 0.1 (.315 ± .004)	330 (7)	100	R4
PQFN 5 × 5	16	8.0 ± 0.1 (.315 ± .004)	330 (13)	1,000	T1
PQFN 8 × 8	16	12.0 ± 0.1 (.472 ± .004)	330 (13)	1,000	T1
QFN 3 × 3	12	8.0 ± 0.1 (.315 ± .004)	178 (7)	1,000	T1
QFN 4 × 4	12	8.0 ± 0.1 (.315 ± .004)	330 (13)	1,000	T1
QFN 6 × 6	16	12.0 ± 0.1 (.472 ± .004)	178 (7)	1,000	R1
SOT-89 ⁽¹⁾	12	8.0 ± 0.1 (.315 ± .004)	178 (7)	1,000	T1
SOT-89 ⁽²⁾	12	8.0 ± 0.1 (.315 ± .004)	180 (7)	1,000	T1
SOT-363	8	4.0 ± 0.1 (.157 ± .004)	178 (7)	3,000	T1
TO-270-2	24	16.0 ± 0.1 (.631 ± .004)	330 (13)	500	R1
TO-270G-2	24	12.0 ± 0.1 (.471 ± .004)	330 (13)	500	R1
TO-270WB-4	44	24.0 ± 0.1 (.945 ± .004)	330 (13)	500	R1
TO-270WBL-4	44	24.0 ± 0.1 (.945 ± .004)	330 (13)	500	R1
TO-270WBG-4	44	24.0 ± 0.1 (.945 ± .004)	330 (13)	500	R1
TO-270WB-6A	44	24.0 ± 0.1 (.945 ± .004)	330 (13)	500	R1
TO-270WB-14	44	24.0 ± 0.1 (.945 ± .004)	330 (13)	500	R1
TO-270WBG-14	44	24.0 ± 0.1 (.945 ± .004)	330 (13)	500	R1
TO-270WB-15	44	24.0 ± 0.1 (.945 ± .004)	330 (13)	500	R1
TO-270WBG-15	44	24.0 ± 0.1 (.945 ± .004)	330 (13)	500	R1
TO-270WBG-16	44	24.0 ± 0.1 (.945 ± .004)	330 (13)	500	R1
TO-270WBG-16	44	24.0 ± 0.1 (.945 ± .004)	330 (13)	500	R1
TO-270WBL-16	44	24.0 ± 0.1 (.945 ± .004)	330 (13)	500	R1
TO-270WBLG-16	44	24.0 ± 0.1 (.945 ± .004)	330 (13)	500	R1
TO-270WB-17	44	24.0 ± 0.1 (.945 ± .004)	330 (13)	500	R1
TO-270WBG-17	44	24.0 ± 0.1 (.945 ± .004)	330 (13)	500	R1
TO-272-2	44	20.0 ± 0.1 (.631 ± .004)	330 (13)	500	R1
TO-272WB-4	44	20.0 ± 0.1 (.788 ± .004)	330 (13)	500	R1
TO-272WB-14	44	20.0 ± 0.1 (.788 ± .004)	330 (13)	500	R1
TO-272WB-16	44	20.0 ± 0.1 (.788 ± .004)	330 (13)	500	R1
TO-272WBLG-16	44	24.0 ± 0.1 (.945 ± .004)	330 (13)	500	R1

1. 98ASA10586D

2. 98ASA00241D

Applications and Product Literature

Application Notes of special interest to designers of RF equipment are listed below. This technical documentation is available on the NXP web site.

Application Notes

AN211A	Field Effect Transistors in Theory and Practice	AN1955	Thermal Measurement Methodology of RF Power Amplifiers
AN419	UHF Amplifier Design Using Data Sheet Design Curves	AN1977	Quiescent Current Thermal Tracking Circuit in the RF Integrated Circuit Family
AN423	Field Effect Transistor RF Amplifier Design Techniques	AN1987	Quiescent Current Control for the RF Integrated Circuit Device Family
AN548A	Microstrip Design Techniques for UHF Amplifiers	AN3100	General Purpose Amplifier and MMIC Biasing
AN721	Impedance Matching Networks Applied to RF Power Transistors	AN3263	Bolt Down Mounting Method for High Power RF Transistors and RFICs in Over-Molded Plastic Packages
AN923	800 MHz Test Fixture Design	AN3778	PCB Layout Guidelines for PQFN/QFN Style Packages Requiring Thermal Vias for Heat Dissipation
AN1032	How Load VSWR Affects Non-Linear Circuits	AN3789	Clamping of High Power RF Transistors and RFICs in Over-Molded Plastic Packages
AN1033	Match Impedances in Microwave Amplifiers	AN4005	Thermal Management and Mounting Method for the PLD 1.5 RF Power Surface Mount Package
AN1034	Three Balun Designs for Push-Pull Amplifiers		
AN1526	RF Power Device Impedances: Practical Considerations		
AN1530	Advanced Amplifier Concept Package		
AN1617	Mounting Recommendations for Copper Tungsten Flanged Transistors		
AN1643	RF LDMOS Power Modules for GSM Base Station Application: Optimum Biasing Circuit		
AN1670	60 Watts, GSM 900 MHz, LDMOS Two-Stage Amplifier		
AN1696	Broadband Intermodulation Performance Development Using the Rohde & Schwarz Vector Network Analyzer ZVR		
AN1907	Solder Reflow Attach Method for High Power RF Devices in Over-Molded Plastic Packages		
AN1908	Solder Reflow Attach Method for High Power RF Devices in Air Cavity Packages		
AN1923	Mounting Method with Mechanical Fasteners for the MRF19090 and Similar Packages		
AN1938	Sensitivity of High Power RF Transistors to Source and Output Loads		
AN1949	Mounting Method for the MHVIC910HR2 (PFP-16) and Similar Surface Mount Packages		

Product Literature

BR1610	RF Power Tool System Brochure
BR1611	RF Aerospace and Defense Solutions Brochure
AIRFASTWBFWP	Advances in Freescale Airfast RFICs White Paper
RFLNAWP	Practical Considerations for Low Noise Amplifier Design White Paper
RFPLASTICWP	Designing with Plastic RF Power Transistors White Paper
SG46	RF Product Selector Guide
SMCELLRFPW	Small Cells Call for Scalable Architecture White Paper
50VRFLDMOSWP	50 V RF LDMOS White Paper

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