

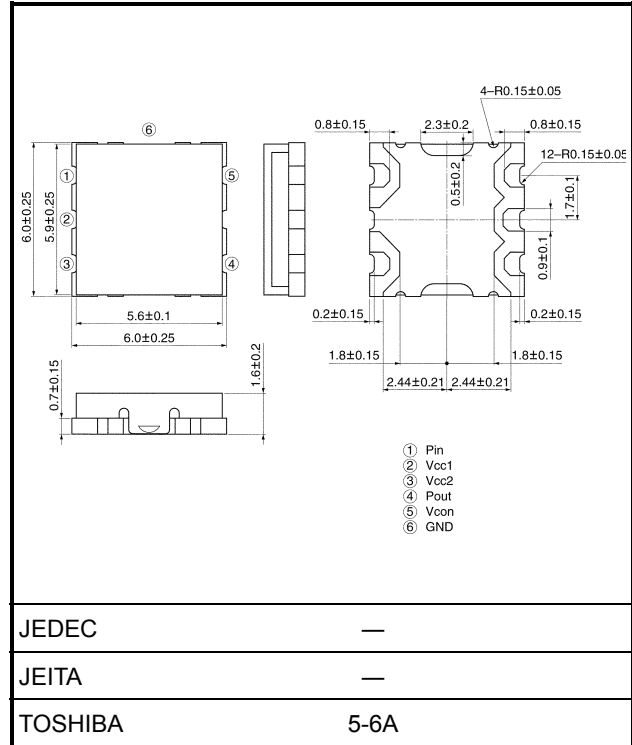
RF Power Amplifier Module

S-AU81

Power Amplifier Modules for Domestic
cdmaOne

Unit: mm

- GaAs HBT Micro PA (on-chip bias circuit and matching circuit)
- Output power: $P_O = 27.0\text{dBmW}$ (min)
- Gain: $G_p = 28.0\text{dB}$ (typ.)
- Total current: $I_t (1) = 385\text{ mA}$ (typ.)
(@ $P_{out} = 27.0\text{dBmW}$)
- Low-voltage operation: Operation at $V_{CC} = 1.5\text{ V}$ is possible
 $I_t (2) = 97\text{ mA}$ (typ.) (@ $P_{out} = 14\text{dBmW}$, $V_{CC} = 1.5\text{ V}$)
- This device features an output control pin which can be switched between low-power and high-power settings.
 $I_t = 90\text{ mA}$ (typ.) (@ $P_{out} = 14\text{dBmW}$, $V_{CC} = 2.70\text{ V}$)



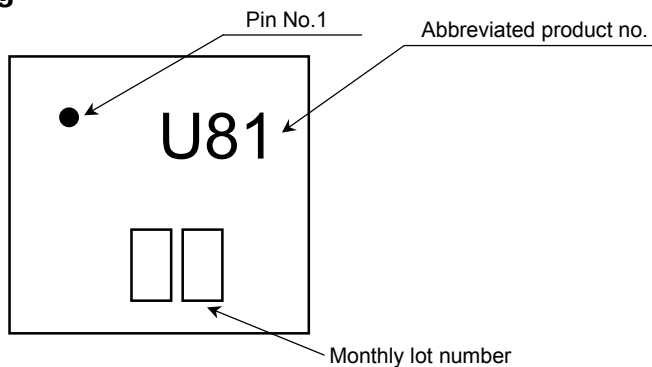
Weight: 0.0 g (typ.)

Maximum Ratings (Ta = 25°C)

Characteristics	Symbol	Rating	Unit
Supply voltage 1	V_{CC1}	5	V
Supply voltage 2	V_{CC2}	5	V
Control voltage	V_{con}	4	V
Collector current	I_{CC}	1	A
Power dissipation	P_D (Note 1)	2	W
Operating temperature	T_{op}	-20~+60	°C
Storage temperature range	T_{stg}	-30~+125	°C

Note 1: Ta = 25°C

Marking



Electrical Characteristics (Tc = 25°C)

Characteristics		Symbol	Test Condition		Min	Typ.	Max	Unit
Power gain (1)		G _p (1)	V _{CC1} , V _{CC} 2 = 3.6 V, V _{con} = 2.85 V (Note 2), P _o = 27dBmW f = 887~925 MHz, P _{in} = adjust, Z _G = Z _L = 50 Ω		25.0	28.0	—	dB
Control current		I _{con}			—	3	5	mA
Total current (1)		I _t (1)			—	385	—	mA
Adjacent-channel power ratio (1)	ACPR1 (1)	V _{CC1} , V _{CC} 2 = 3.6 V, V _{con} = 2.85 V (Note 2), P _o = 27dBmW, f = 887~925 MHz, Z _G = Z _L = 50 Ω (Note 3)		900 kHz	—	−50	−45	dB
	ACPR2 (2)			1.98 MHz	—	−60	−56	dB
Power gain (2)		G _p (2)	V _{CC1} , V _{CC} 2 = 1.5 V, V _{con} = 2.85 V (Note 2), P _o = 14dBmW, f = 887~925 MHz, P _{in} = adjust, Z _G = Z _L = 50 Ω		21.0	24.0	—	dB
Total current (2)		I _t (2)			—	97	—	mA
Adjacent-channel power ratio (2)	ACPR1 (2)	V _{CC1} , V _{CC} 2 = 1.5 V, V _{con} = 2.85 V (Note 2), P _o = 14dBmW, f = 887~925 MHz, Z _G = Z _L = 50 Ω (Note 3)		900 kHz	—	−50	−45	dB
	ACPR2 (2)			1.98 MHz	—	−60	−56	dB
Power gain (3)		G _p (3)	V _{CC1} , V _{CC} 2 = 3.6 V, V _{con} = 2.85 V (Note 2), P _o = 27dBmW, f = 887~925 MHz, P _{in} = adjust, Z _G = Z _L = 50 Ω), T _c = −20~+60°C		24.0	27.0	—	dB
Adjacent-channel power ratio (3)	ACPR1 (3)	V _{CC1} , V _{CC} 2 = 3.6 V, V _{con} = 2.85 V (Note 2), P _o = 27dBmW, f = 887~925 MHz, Z _G = Z _L = 50 Ω,		900 kHz	—	−48	−43	dB
	ACPR2 (3)	T _c = −20~+60°C (Note 3)		1.98 MHz	—	−58	−55	dB
VSWRin		VSWRin	V _{CC1} , V _{CC} 2 = 3.6 V, V _{con} = 2.85 V (Note 3), P _o = 27dBmW, f = 887~925 MHz, P _{in} = adjust, Z _G = Z _L = 50 Ω		—	2	3	—
Harmonics	2fo	HRM (1)			—	—	−30	dB
	3fo	HRM (2)			—	—	−45	dB
Stability		SPR	V _{CC1} , V _{CC} 2 = 1.5 V, 2.5 V, 3.6 V, 4.2 V, V _{con} = 2.85 V (Note 3), P _o ≤ 27dBmW, f = 887~925 MHz, P _{in} = adjust, Z _G = 50 Ω, VSWR LOAD = 3:1 all phase		—	—	−60	dB
Receiving band noise		NRB	V _{CC1} , V _{CC} 2 = 3.6 V, V _{con} = 2.85 V (Note 2), P _o ≤ 27dBmW, f = 887~925 MHz, P _{in} = adjust, Z _G = Z _L = 50 Ω		—	−135	—	dBmW/Hz
Load mismatch		—	V _{CC1} , V _{CC} 2 = 1.5 V~4.2 V, V _{con} = 2.85 V (Note 2), P _o ≤ 27dBmW, f = 887~925 MHz, P _{in} = adjust, Z _G = 50 Ω, VSWR LOAD = 3:1 all phase		No degradation			—

Caution: This RF power amplifier is the electrostatic sensitive device. Please handle with caution.

Note 2: V_{con} = 2.85 V is set to obtain I_{idle} ≈ 75 mA when V_{CC1}, V_{CC2} = 3.6 V

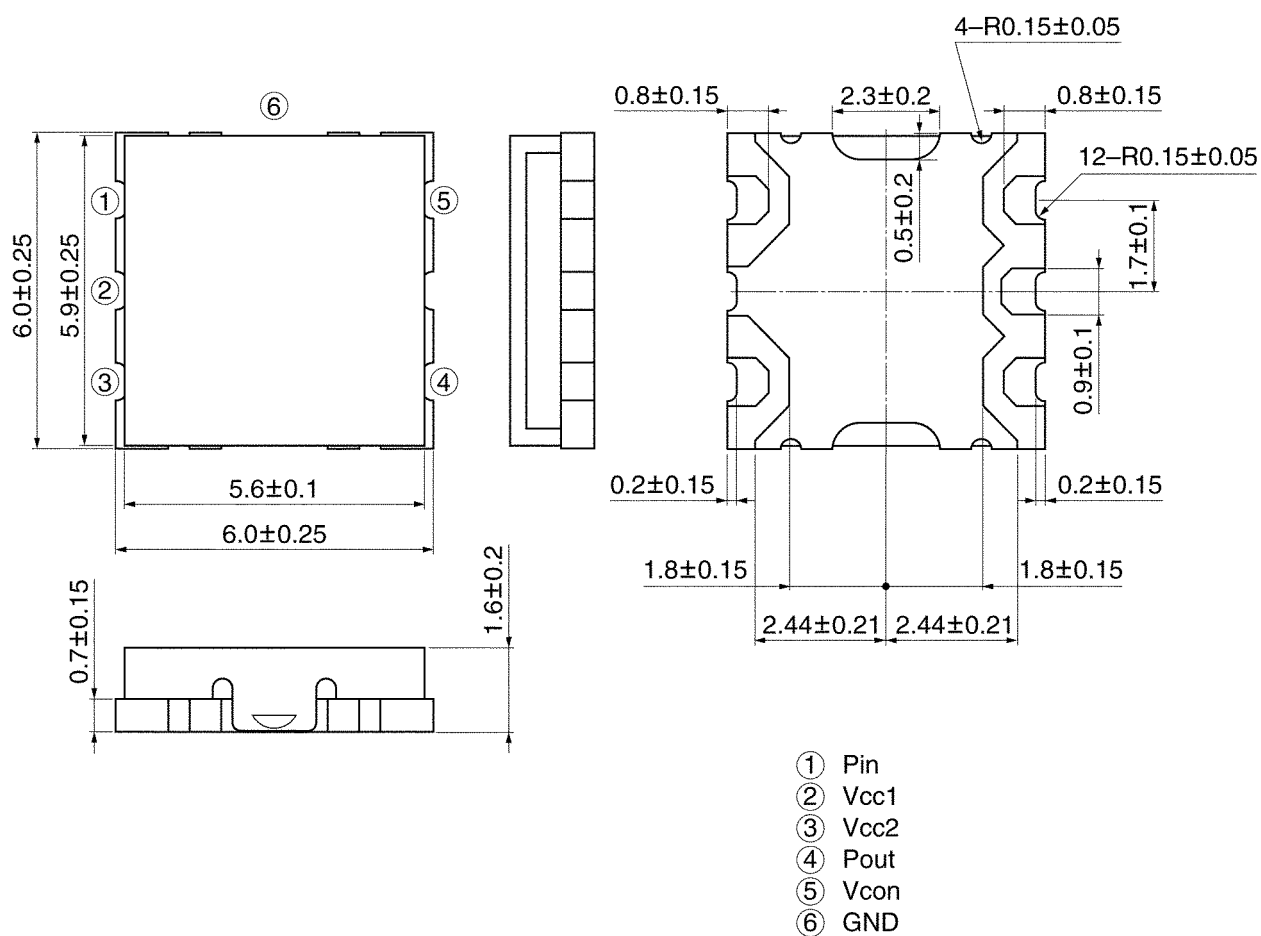
Note 3: ACPR

- P_c (1.23 MHz) is average power measured for 1.23 MHz bandwidth with CDMA signal.
- P (30 kHz) is average power measured for 30 kHz bandwidth with 900 kHz/1.98 MHz offset.
- ACPR1 (or ACPR2) = P (30 kHz) – P_c (1.23 MHz) dB

Note 4: These electrical characteristics are measured using Toshiba recommended test board.

Package Dimensions

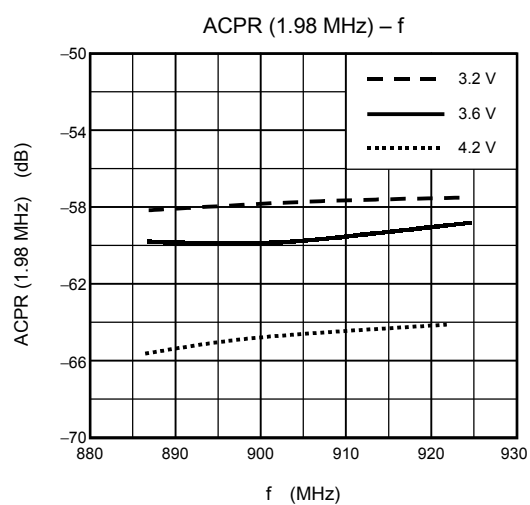
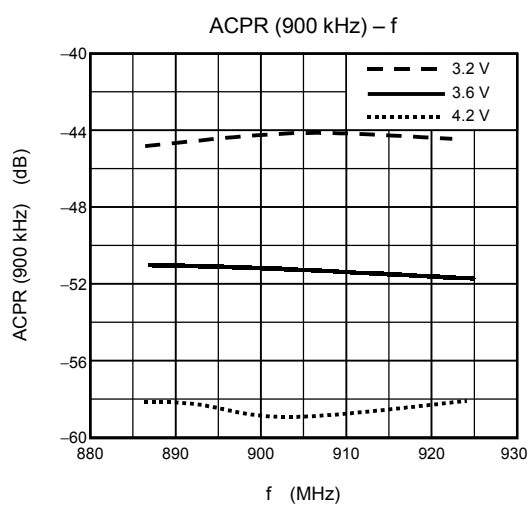
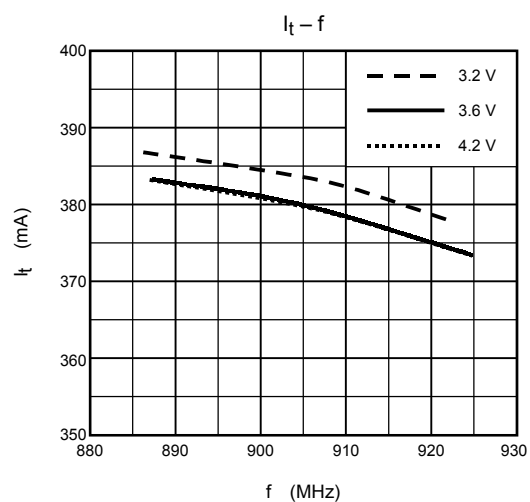
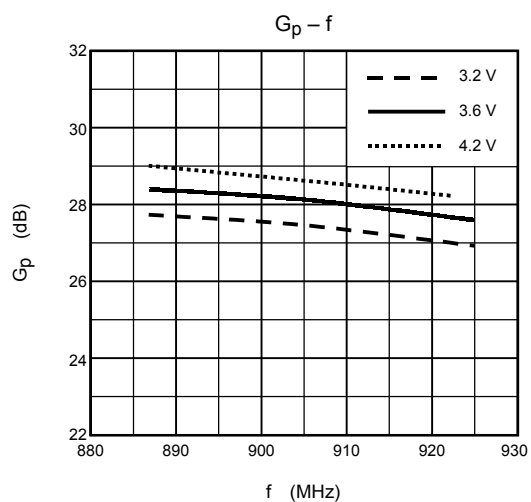
unit : mm



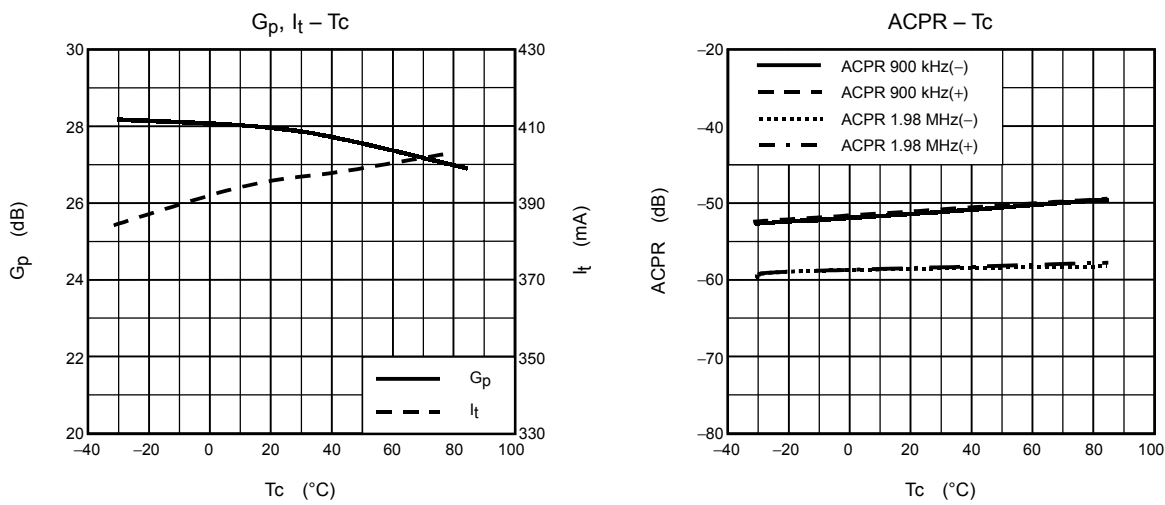
Typical Characteristic Curves

(1) Frequency Characteristics

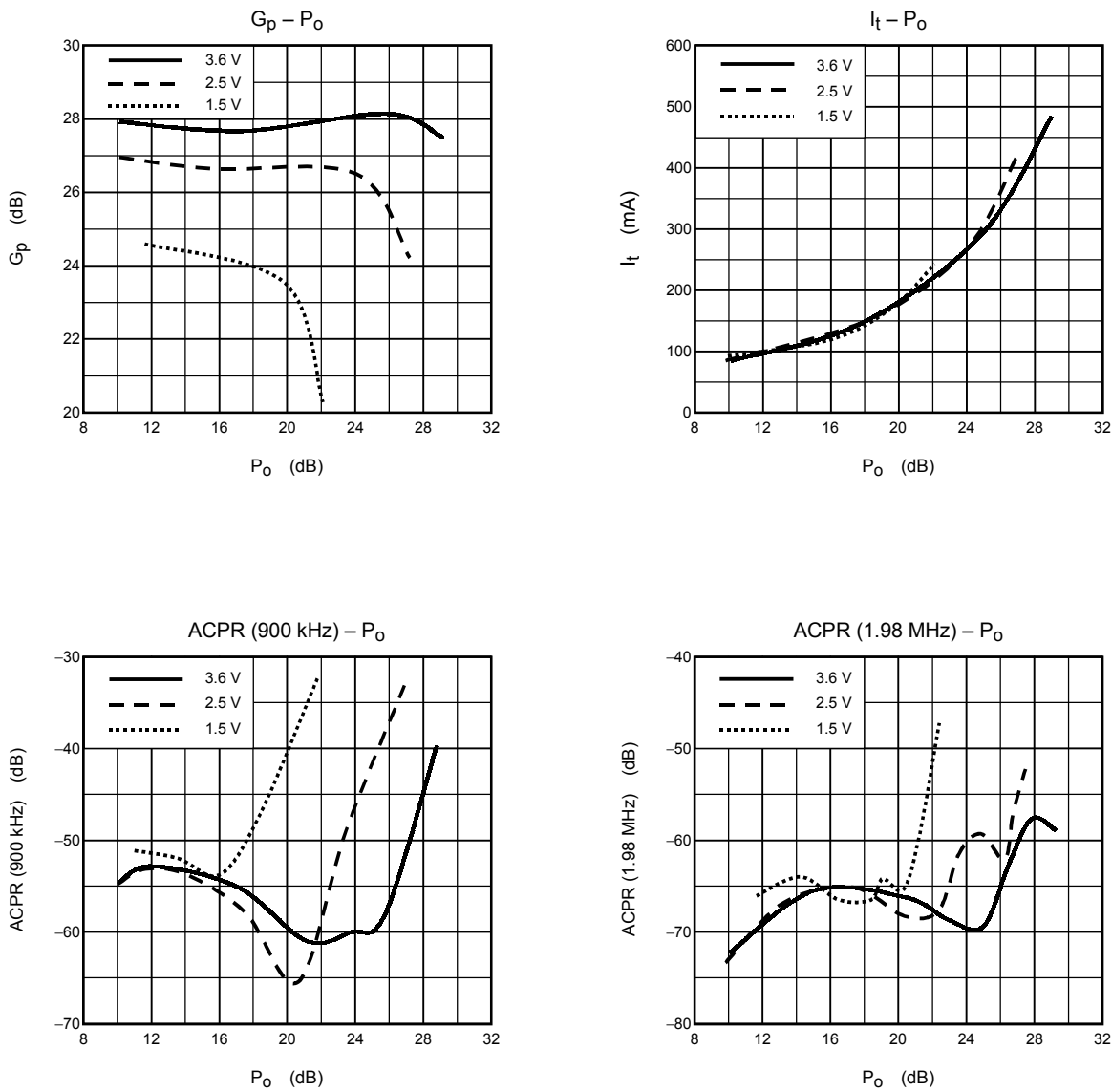
$P_0 = 27\text{dBmW}$, $V_{\text{con}} = 2.85\text{ V}$, V_{CC1} , $V_{\text{CC2}} = 3.6\text{ V}$



(2) Temperature Characteristics
 $P_0 = 27\text{dBmW}$, $V_{\text{con}} = 2.85\text{ V}$, $f = 906\text{ MHz}$, V_{CC1} , $V_{\text{CC2}} = 3.6\text{ V}$

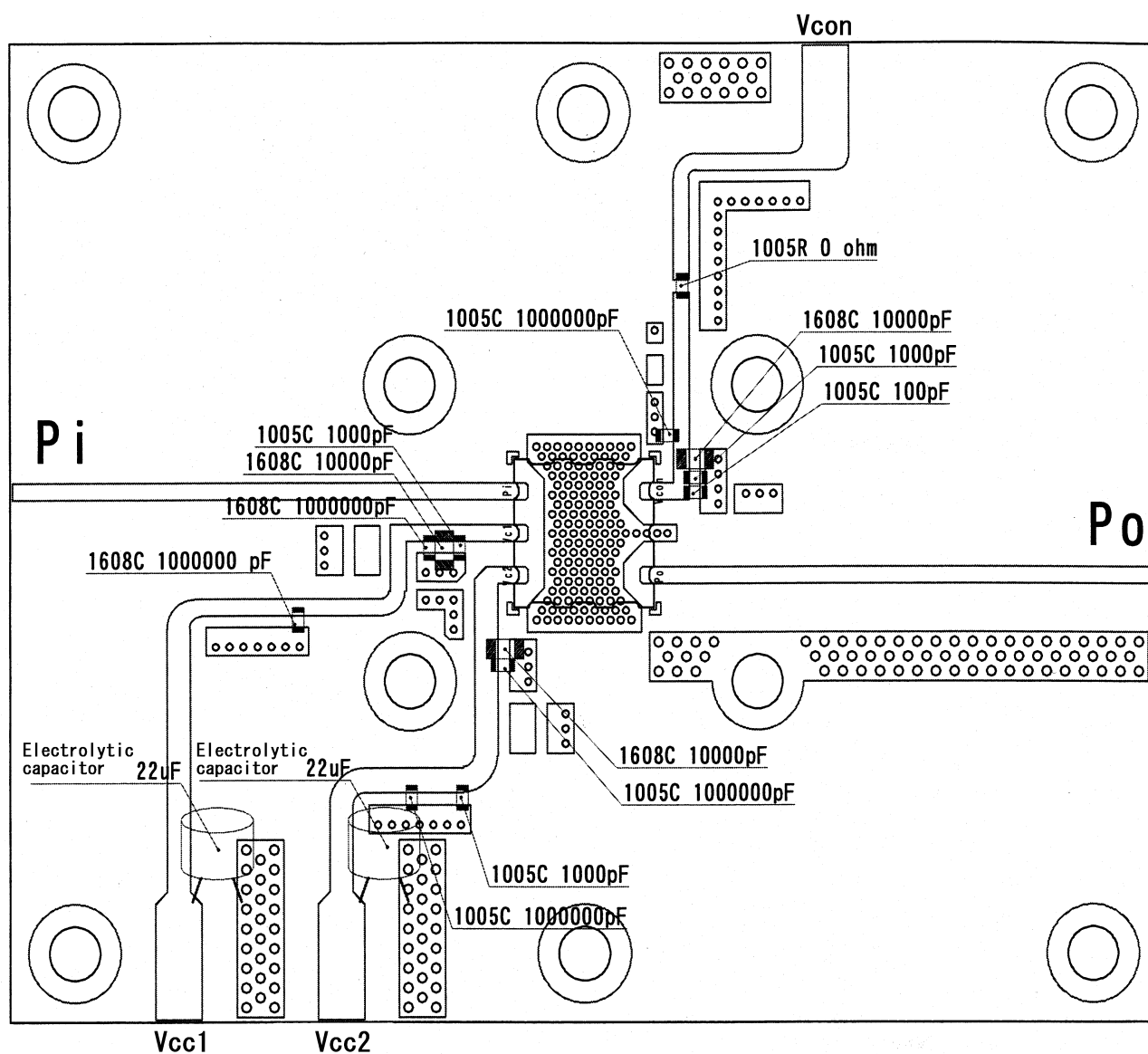


(3) Power Supply Voltage
VCC Characteristics (f = 906 MHz, Vcon = 2.85 V)



Note: These are only typical curves and devices are not necessarily guaranteed at these curves.

Test Board



Note for biasing procedure: Please follow this sequence when you measure a device bias sequence.

- Vcc1, Vcc2 On 0 V to Supply Voltage
- Vcon On adjust idle current
- RF on

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