IRFY Series Data Sheet

The IRFY Data Sheet describes 12 devices, 8 N-Channel and 4 P-Channel, all contained in the TO-257AB package. This data sheet is arranged to show common tabular and graphical information between devices.

Absolute maximum ratings and parametric data are presented in tabular format with devices grouped according to generically shared parameters. For each parametric rating, devices are categorized by N and P channel and listed in alpha-numeric order. The conditions specified for a given parametric test are provided in the right hand column of each table.

Graphical information is grouped by devices in alphabetical order. Where the information is device specific, we have assigned a numeric character for the graph type and an alpha character to a given device. (See Table A below). Where graphs are polarity specific as in figures 10, 12, 14 and 15, we have indicated N-Channel or P-Channel. The Thermal Impedance Graph (Fig. 11) is the only exception where a graph is common to both N-Channel and P-Channel devices since the thermal impedance is only dependent on the die size and package.

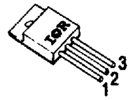
In Table A below, a legend is provided cross referencing the part number to its assigned alpha code. A given device will retain this alpha code for each device specific graph.

Table A

DEVICE	ALPHA DESIGNATION
IRFY044	a
IRFY120	b
IRFY130	c
IRFY140	d
IRFY240	e
IRFY340	f
IRFY430	g
IRFY440	h
IRFY9120	i
IRFY9130	j
IRFY9140	k
IRFY9240	l

HEXFET, CECC Qualified — Europe

T0257/HEXFET/N-Channel

Basic Type	V_{DS} (V)	$R_{DS(on)}$ (Ohms)	CECC Specification	Issue No.	Issue Date	Level of Quality Assessment and CECC 50 000 Screen Level Options	Case Outline
IRFY044(M)	60	0.03	50 012-062	1	10/91	E-,EA,EB,EC,ED	**TO-257AA** Y-PAK 
IRFY120(M)	100	0.31	50 012-060			E-,EA,EB,EC,ED	
IRFY130(M)	100	0.19	50 012-061			E-,EA,EB,EC,ED	
IRFY140(M)	100	0.092	50 012-062			E-,EA,EB,EC,ED	
IRFY240(M)	200	0.19	50 012-062			E-,EA,EB,EC,ED	
IRFY340(M)	400	0.55	50 012-062			E-,EA,EB,EC,ED	
IRFY430(M)	500	1.50	50 012-061			E-,EA,EB,EC,ED	
IRFY440(M)	500	0.85	50 012-062			E-,EA,EB,EC,ED	

T0257/HEXFET/P-Channel

Basic Type	V_{DS} (V)	$R_{DS(on)}$ (Ohms)	CECC Specification	Issue No.	Issue Date	Level of Quality Assessment and CECC 50 000 Screen Level Options
IRFY9120(M)	-100	0.60	50 012-063	1	10/91	E-,EA,EB,EC,ED
IRFY9130(M)	-100	0.31	50 012-064			E-,EA,EB,EC,ED
IRFY9140(M)	-100	0.21	50 012-065			E-,EA,EB,EC,ED
IRFY9240(M)	-200	0.50	50 012-065			E-,EA,EB,EC,ED

	1	2	3
IRFY	G	D	S
IRFY(M)	D	S	G

FOR OTHER GOVERNMENT/SPACE QUALIFIED PRODUCTS SEE SECTION E.

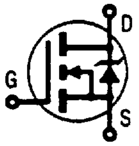
Data Sheet No. PD-9.878

INTERNATIONAL RECTIFIER IOR

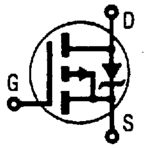
HEXFET® TRANSISTORS

IRFY SERIES

IRFY044 THRU IRFY440
IRFY9120 THRU IRFY9240



N-CHANNEL



P-CHANNEL

Description

The HEXFET® technology is the key to International Rectifier's advance line of power MOSFET transistors. The efficient geometry design achieves very low on-state resistance combined with high transconductance.

The HEXFET transistors also feature all of the well established advantages of MOSFETs such as voltage control, very fast switching, ease of paralleling and temperature stability of the electrical parameters.

They are well suited for applications such as switching power supplies and virtually any application where military and/or high reliability is required.

The totally isolated package eliminates the need for additional isolating material between the device and the heatsink, this improves the thermal efficiency and reduces drain capacitance.

FEATURES

- Isolated and Hermetically Sealed
- Alternative to TO-39 and TO-66 Packages
- Simple Drive Requirements
- Ease of Paralleling
- Ceramic eyelet package used on all space level applications or on request

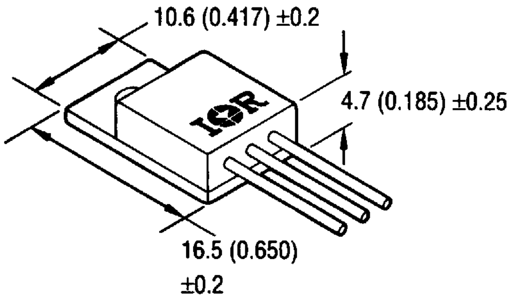
Product Summary N-Channel

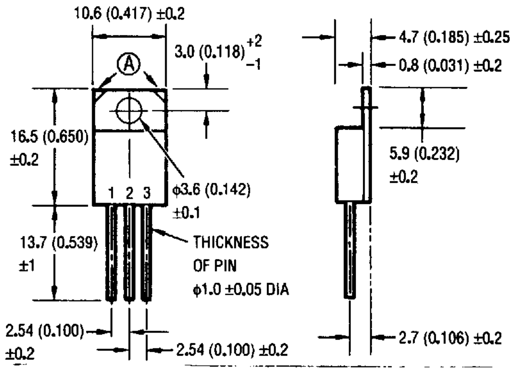
Characteristic	IRFY044 thru IRFY440	Units
BV_{DSS}	60 to 500	V
$R_{DS(on)}$	0.035 to 1.6	Ω
I_D	3.7 to 20	A

Product Summary P-Channel

Characteristic	IRFY9120 thru IRFY9240	Units
BV_{DSS}	–100 to –200	V
$R_{DS(on)}$	0.21 to 0.50	Ω
I_D	–5.3 to –13	A

CASE STYLE AND DIMENSIONS





TERM	IRFY . . .	IRFY . . . M
1	GATE	DRAIN
2	DRAIN	SOURCE
3	SOURCE	GATE

Ⓐ Corners removed to indicate 'M' option

Conforms to JEDEC Outline TO-257AB
Dimensions in Millimeters and (Inches)

N-CHANNEL — Absolute Maximum Ratings

	Parameter	IRFY044	IRFY120	IRFY130	IRFY140	Unit
I_D @ T_C = 25°C	Continuous Drain Current	20*	7.3	11	18	A
I_D @ T_C = 100°C	Continuous Drain Current	20	4.6	7.0	12	A
I_{DM}	Pulsed Drain Current	128	29	44	72	A
V_{GS}	Gate-Source Voltage	±20				V
P_D @ T_C = 25°C	Maximum Power Dissipation	60	30	45	60	W
	Linear Derating Factor	0.48	0.24	0.36	0.48	W/K
T_J T_{stg}	Operating Junction Storage Temperature Range	–55 to 150				°C
	Weight	3.4 (typical)				g

*I_D current limited by pin diameter

N-CHANNEL — Absolute Maximum Ratings (Continued)

	Parameter	IRFY240	IRFY340	IRFY430	IRFY440	Unit
I_D @ T_C = 25°C	Continuous Drain Current	12	6.9	3.7	5.5	A
I_D @ T_C = 100°C	Continuous Drain Current	7.8	4.4	2.4	3.5	A
I_{DM}	Pulsed Drain Current	48	27	14	22	A
V_{GS}	Gate-Source Voltage	±20				V
P_D @ T_C = 25°C	Maximum Power Dissipation	60	60	45	60	W
	Linear Derating Factor	0.48	0.48	0.36	0.48	W/K
T_J T_{stg}	Operating Junction Storage Temperature Range	–55 to 150				°C
	Weight	3.4 (typical)				g

P-CHANNEL — Absolute Maximum Ratings

	Parameter	IRFY9120	IRFY9130	IRFY9140	IRFY9240	Unit
I_D @ T_C = 25°C	Continuous Drain Current	–5.3	–9.3	–13	–7.7	A
I_D @ T_C = 100°C	Continuous Drain Current	–3.4	–5.8	–8.2	–4.9	A
I_{DM}	Pulsed Drain Current	–21	–37	–52	–30	V
V_{GS}	Gate-Source Voltage	±20				V
P_D @ T_C = 25°C	Maximum Power Dissipation	30	45	60	60	W
	Linear Derating Factor	0.24	0.36	0.48	0.48	W/K
T_J T_{stg}	Operating Junction Storage Temperature Range	–55 to 150				°C
	Weight	3.4 (typical)				g

Electrical Characteristics @ T_C = 25°C (Unless otherwise specified)

Parameter		Type	Min.	Typ.	Max.	Units	Test Conditions
BV_{DSS}	Drain-Source Breakdown Voltage	IRFY044	60	—	—	V	I_D = 1.0mA, V_{GS} = 0V
		IRFY120	100	—	—		
		IRFY130	100	—	—		
		IRFY140	100	—	—		
		IRFY240	200	—	—		
		IRFY340	400	—	—		
		IRFY430	500	—	—		
		IRFY440	500	—	—		
		IRFY9120	−100	—	—		I_D = −1.0mA, V_{GS} = 0V
		IRFY9130	−100	—	—		
		IRFY9140	−100	—	—		
		IRFY9240	−200	—	—		
$\Delta BV_{DSS}/\Delta T_J$	Temperature Coefficient of Breakdown Voltage	IRFY044	—	0.68	—	V/°C	Reference to 25°C, I_D = 1.0mA
		IRFY120	—	0.1	—		
		IRFY130	—	0.1	—		
		IRFY140	—	0.1	—		
		IRFY240	—	0.29	—		
		IRFY340	—	0.46	—		
		IRFY430	—	0.78	—		
		IRFY440	—	0.78	—		
		IRFY9120	—	−0.1	—		Reference to 25°C, I_D = −1.0mA
		IRFY9130	—	−0.1	—		
		IRFY9140	—	−0.087	—		
		IRFY9240	—	−0.20	—		
$R_{DS(on)}$	Static Drain-Source On-State Resistance	IRFY044	—	—	0.035	Ω	I_D = 20A V_{GS} = 10V
		IRFY120	—	—	0.31		I_D = 4.6A
			—	—	0.36		I_D = 7.3A
		IRFY130	—	—	0.19		I_D = 7.0A
			—	—	0.22		I_D = 11A
		IRFY140	—	—	0.092		I_D = 12A
			—	—	0.11		I_D = 18A
		IRFY240	—	—	0.19		I_D = 7.8A
			—	—	0.22		I_D = 12A
		IRFY340	—	—	0.55		I_D = 4.4A
			—	—	0.63		I_D = 6.9A
		IRFY430	—	—	1.6		I_D =2.4A
			—	—	1.84		I_D = 3.7A
		IRFY440	—	—	0.85		I_D = 3.5A
			—	—	0.98		I_D = 5.5A
		IRFY9120	—	—	0.60		I_D = −3.4A V_{GS} = −10V
			—	—	0.69		I_D = −5.3A
		IRFY9130	—	—	0.31		I_D = −5.8A
			—	—	0.36		I_D = −9.3A
		IRFY9140	—	—	0.21		I_D = −8.2A
			—	—	0.24		I_D = −13A
		IRFY9240	—	—	0.50		I_D = −4.9A
			—	—	0.58		I_D = −7.7A
$V_{GS(th)}$	Gate Threshold Voltage	N-Channel	2.0	—	4.0	V	V_{DS} = V_{GS}, I_D = 250µA
		P-Channel	−2.0	—	−4.0		V_{DS} = V_{GS}, I_D = −250µA

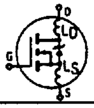
Electrical Characteristics (Continued)

Parameter		Type	Min.	Typ.	Max.	Units	Test Conditions	
g_{fs}	Forward Transconductance	IRFY044	17	—	—	S(℧)	I_D = 20A	V_{DS} ≥ 15V
		IRFY120	1.5	—	—		I_D = 4.6A	
		IRFY130	3.0	—	—		I_D = 7.0A	
		IRFY140	9.1	—	—		I_D = 12A	
		IRFY240	6.1	—	—		I_D = 7.8A	
		IRFY340	4.9	—	—		I_D = 4.4A	
		IRFY430	1.5	—	—		I_D = 2.4A	
		IRFY440	4.7	—	—		I_D = 3.5A	
		IRFY9120	1.25	—	—		I_D = −3.4A	V_{DS} ≥ −15V
		IRFY9130	2.5	—	—		I_D = −5.8A	
		IRFY9140	6.2	—	—		I_D = −8.2A	
		IRFY9240	4.0	—	—		I_D = −4.9A	
I_{DSS}	Zero Gate Voltage Drain Current	N-Channel	—	—	25	µA	V_{DS} = 0.8 x Max. Rating, V_{GS} = 0V	
			—	—	250		V_{DS} = 0.8 x Max. Rating, V_{GS} = 0V, T_J = 25°C	
		P-Channel	—	—	−25		V_{DS} = 0.8 x Max. Rating, V_{GS} = 0V	
			—	—	−250		V_{DS} = 0.8 x Max. Rating, V_{GS} = 0V, T_J = 125°C	
I_{GSS}	Gate-Source Leakage Forward	N-Channel	—	—	100	nA	V_{GS} = 20V	
		P-Channel	—	—	−100		V_{GS} = −20V	
I_{GSS}	Gate-Source Leakage Reverse	N-Channel	—	—	−100		V_{GS} = −20V	
		P-Channel	—	—	100		V_{GS} = 20V	
Q_g	Total Gate Charge (Gate-Source plus Gate-Drain)	IRFY044	39	—	88	nC	I_D = 20A	V_{GS} = 10V, V_{DS} = 0.5 x V_{DS} max.
		IRFY120	7.7	—	17		I_D = 7.3A	
		IRFY130	12.8	—	28.5		I_D = 11A	
		IRFY140	30	—	59		I_D = 18A	
		IRFY240	32	—	60		I_D = 12A	
		IRFY340	32	—	65		I_D = 6.9A	
		IRFY430	19.8	—	29.5		I_D = 3.7A	
		IRFY440	27.3	—	68.5		I_D = 5.5A	
		IRFY9120	4.3	—	16.3		I_D = −5.3A	V_{GS} = −10V, V_{DS} = 0.5 x V_{DS} max.
		IRFY9130	14.7	—	30		I_D = −9.3A	
		IRFY9140	31	—	60		I_D = −13A	
		IRFY9240	28	—	60		I_D = −7.7A	
Q_{gs}	Gate Source Charge	IRFY044	6.7	—	15	nC	I_D = 20A	V_{GS} = 10V, V_{DS} = 0.5 x V_{DS} max.
		IRFY120	0.7	—	4.0		I_D = 7.3A	
		IRFY130	1.0	—	6.3		I_D = 11A	
		IRFY140	2.4	—	12		I_D = 18A	
		IRFY240	2.2	—	10.6		I_D = 12A	
		IRFY340	2.2	—	10		I_D = 6.9A	
		IRFY430	2.2	—	4.6		I_D = 3.7A	
		IRFY440	2.0	—	12.5		I_D = 5.5A	
		IRFY9120	1.3	—	4.7		I_D = −5.3A	V_{GS} = −10V, V_{DS} = 0.5 x V_{DS} max.
		IRFY9130	1.0	—	7.1		I_D = −9.3A	
		IRFY9140	3.7	—	13		I_D = −13A	
		IRFY9240	3.0	—	15		I_D = −7.7A	

Electrical Characteristics (Continued)

Parameter		Type	Min.	Typ.	Max.	Units	Test Conditions	
Q_{gd}	Gate Drain ("Miller") Charge	IRFY044	18	—	52	nC	I_D = 20A	V_{GS} = 10V, V_{DS} = 0.5 x V_{DS} max.
		IRFY120	2.0	—	8.0		I_D = 7.3A	
		IRFY130	3.8	—	16.6		I_D = 11A	
		IRFY140	12	—	30.7		I_D = 18A	
		IRFY240	14.2	—	37.6		I_D = 12A	
		IRFY340	13.8	—	40.5		I_D = 6.9A	
		IRFY430	5.5	—	19.7		I_D = 3.7A	
		IRFY440	11.1	—	42.4		I_D = 5.5A	
		IRFY9120	1.0	—	9.0		I_D = -5.3A	V_{GS} = -10V, V_{DS} = V_{DS} max. x 0.8
		IRFY9130	2.0	—	21		I_D = -9.3A	
		IRFY9140	7.0	—	35.2		I_D = -13A	
		IRFY9240	4.5	—	38		I_D = -7.7A	
$t_{d(on)}$	Turn-on Delay Time	IRFY044	—	—	23	ns	V_{DD} = 30V, I_D = 20A, R_G = 9.1Ω	V_{GS} = 10V
		IRFY120	—	—	15		V_{DD} = 50V, I_D = 7.3A, R_G = 7.5Ω	
		IRFY130	—	—	30		V_{DD} = 50V, I_D = 11A, R_G = 7.5Ω	
		IRFY140	—	—	21		V_{DD} = 50V, I_D = 18A, R_G = 9.1Ω	
		IRFY240	—	—	20		V_{DD} = 100V, I_D = 12A, R_G = 9.1Ω	
		IRFY340	—	—	25		V_{DD} = 200V, I_D = 6.9A, R_G = 9.1Ω	
		IRFY430	—	—	35		V_{DD} = 250V, I_D = 3.7A, R_G = 7.5Ω	
		IRFY440	—	—	21		V_{DD} = 250V, I_D = 5.5A, R_G = 9.1Ω	
		IRFY9120	—	—	60		V_{DD} = -50V, I_D = -5.3A, R_G = 7.5Ω	V_{GS} = -10V
		IRFY9130	—	—	60		V_{DD} = -50V, I_D = -9.3A, R_G = 7.5Ω	
		IRFY9140	—	—	35		V_{DD} = -50V, I_D = -13A, R_G = 9.1Ω	
		IRFY9240	—	—	35		V_{DD} = -100V, I_D = -7.7A, R_G = 9.1Ω	
t_r	Rise Time	IRFY044	—	—	130	ns	V_{DD} = 30V, I_D = 20A, R_G = 9.1Ω	V_{GS} = 10V
		IRFY120	—	—	70		V_{DD} = 50V, I_D = 7.3A, R_G = 7.5Ω	
		IRFY130	—	—	75		V_{DD} = 50V, I_D = 11A, R_G = 7.5Ω	
		IRFY140	—	—	145		V_{DD} = 50V, I_D = 18A, R_G = 9.1Ω	
		IRFY240	—	—	152		V_{DD} = 100V, I_D = 12A, R_G = 9.1Ω	
		IRFY340	—	—	92		V_{DD} = 200V, I_D = 6.9A, R_G = 9.1Ω	
		IRFY430	—	—	30		V_{DD} = 250V, I_D = 3.7A, R_G = 7.5Ω	
		IRFY440	—	—	73		V_{DD} = 250V, I_D = 5.5A, R_G = 9.1Ω	
		IRFY9120	—	—	100		V_{DD} = -50V, I_D = -5.3A, R_G = 7.5Ω	V_{GS} = -10V
		IRFY9130	—	—	140		V_{DD} = -50V, I_D = -9.3A, R_G = 7.5Ω	
		IRFY9140	—	—	85		V_{DD} = -50V, I_D = -13A, R_G = 9.1Ω	
		IRFY9240	—	—	85		V_{DD} = -100V, I_D = -7.7, R_G = 9.1Ω	
$t_{d(off)}$	Turn-Off Delay Time	IRFY044	—	—	81	ns	V_{DD} = 30V, I_D = 20A, R_G = 9.1Ω	V_{GS} = 10V
		IRFY120	—	—	40		V_{DD} = 50V, I_D = 7.3A, R_G = 7.5Ω	
		IRFY130	—	—	40		V_{DD} = 50V, I_D = 11A, R_G = 7.5Ω	
		IRFY140	—	—	64		V_{DD} = 50V, I_D = 18A, R_G = 9.1Ω	
		IRFY240	—	—	58		V_{DD} = 100V, I_D = 12A, R_G = 9.1Ω	
		IRFY340	—	—	79		V_{DD} = 200V, I_D = 6.9A, R_G = 9.1Ω	
		IRFY430	—	—	55		V_{DD} = 250V, I_D = 3.7A, R_G = 7.5Ω	
		IRFY440	—	—	72		V_{DD} = 250V, I_D = 5.5A, R_G = 9.1Ω	
		IRFY9120	—	—	50		V_{DD} = -50V, I_D = -5.3A, R_G = 7.5Ω	V_{GS} = -10V
		IRFY9130	—	—	140		V_{DD} = -50V, I_D = -9.3A, R_G = 7.5Ω	
		IRFY9140	—	—	85		V_{DD} = -50V, I_D = -13A, R_G = 9.1Ω	
		IRFY9240	—	—	85		V_{DD} = -100V, I_D = -7.7, R_G = 9.1Ω	

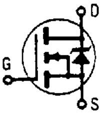
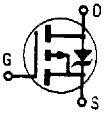
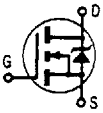
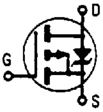
Electrical Characteristics (Continued)

Parameter		Type	Min.	Typ.	Max.	Units	Test Conditions	
t_f	Fall Time	IRFY044	—	—	79	ns	V_{DD} = 30V, I_D = 20A, R_G = 9.1Ω	V_{GS} = 10V
		IRFY120	—	—	70		V_{DD} = 50V, I_D = 7.3A, R_G = 7.5Ω	
		IRFY130	—	—	45		V_{DD} = 50V, I_D = 11A, R_G = 7.5Ω	
		IRFY140	—	—	105		V_{DD} = 50V, I_D = 18A, R_G = 9.1Ω	
		IRFY240	—	—	67		V_{DD} = 100V, I_D = 12A, R_G = 9.1Ω	
		IRFY340	—	—	58		V_{DD} = 200V, I_D = 6.9A, R_G = 9.1Ω	
		IRFY430	—	—	30		V_{DD} = 250V, I_D = 3.7A, R_G = 7.5Ω	
		IRFY440	—	—	51		V_{DD} = 250V, I_D = 5.5A, R_G = 9.1Ω	
		IRFY9120	—	—	70		V_{DD} = −50V, I_D = −5.3A, R_G = 7.5Ω	V_{GS} = −10V
		IRFY9130	—	—	140		V_{DD} = −50V, I_D = −9.3A, R_G = 7.5Ω	
		IRFY9140	—	—	65		V_{DD} = −50V, I_D = −13A, R_G = 9.1Ω	
		IRFY9240	—	—	65		V_{DD} = −100V, I_D = −7.7A, R_G = 9.1Ω	
L_D	Internal Drain Inductance	N-Channel	—	8.7	—	nH	Measured from the drain lead, 6 mm (0.25 in.) from package to center of die	Modified MOSFET symbol showing the internal inductances. 
L_S	Internal Source Inductance						Meaured from the source lead, 6 mm (0.25 in.) from package to center of source bonding pad	
L_D	Internal Drain Inductance	P-Channel	—	8.7	—	nH	Measured from the drain lead, 6 mm (0.25 in.) from package to center of die	Modified MOSFET symbol showing the internal inductances. 
L_S	Internal Source Inductance						Meaured from the source lead, 6 mm (0.25 in.) from package to center of source bonding pad	
C_{iss}	Input Capacitance	IRFY044	—	2400	—	pF	V_{GS} = 0V, V_{DS} = 25V, f = 1.0 MHz See fig. 5	
		IRFY120	—	350	—			
		IRFY130	—	650	—			
		IRFY140	—	1660	—			
		IRFY240	—	1300	—			
		IRFY340	—	1400	—			
		IRFY430	—	610	—			
		IRFY440	—	1300	—			
		IRFY9120	—	380	—			
		IRFY9130	—	800	—			
		IRFY9140	—	1400	—			
		IRFY9240	—	1200	—			
C_{oss}	Output Capacitance	IRFY044	—	1100	—	pF	V_{GS} = 0V, V_{DS} = 25V, f = 1.0 MHz See fig. 5	
		IRFY120	—	150	—			
		IRFY130	—	240	—			
		IRFY140	—	550	—			
		IRFY240	—	400	—			
		IRFY340	—	350	—			
		IRFY430	—	135	—			
		IRFY440	—	310	—			
		IRFY9120	—	170	—			
		IRFY9130	—	350	—			
		IRFY9140	—	600	—			
		IRFY9240	—	570	—			

Electrical Characteristics (Continued)

Parameter		Type	Min.	Typ.	Max.	Units	Test Conditions
C_{rss}	Reverse Transfer Capacitance	IRFY044	—	230	—	pF	V_{GS} = 0V, V_{DS} = 25V, f = 1.0 MHz See fig. 5
		IRFY120	—	24	—		
		IRFY130	—	44	—		
		IRFY140	—	120	—		
		IRFY240	—	130	—		
		IRFY340	—	230	—		
		IRFY430	—	65	—		
		IRFY440	—	120	—		
		IRFY9120	—	45	—		
		IRFY9130	—	125	—		
		IRFY9140	—	200	—		
		IRFY9240	—	81	—		

Source-Drain Diode Rating and Characteristics

Parameter		Type	Min.	Typ.	Max.	Units	Test Conditions
I_S	Continuous Source Current (Body Diode)	IRFY044	—	—	20	A	Modified MOSFET symbol showing the integral reverse p-n junction rectifier.  N-Channel
		IRFY120	—	—	7.3		
		IRFY130	—	—	11		
		IRFY140	—	—	18		
		IRFY240	—	—	12		
		IRFY340	—	—	6.9		
		IRFY430	—	—	3.7		
		IRFY440	—	—	5.5		
		IRFY9120	—	—	-5.3		 P-Channel
		IRFY9130	—	—	-9.3		
		IRFY9140	—	—	-13		
		IRFY9240	—	—	-7.7		
I_{SM}	Pulsed Source Current (Body Diode)	IRFY044	—	—	128	A	Modified MOSFET symbol showing the integral reverse p-n junction rectifier.  N-Channel
		IRFY120	—	—	29		
		IRFY130	—	—	43		
		IRFY140	—	—	73		
		IRFY240	—	—	49		
		IRFY340	—	—	27		
		IRFY430	—	—	14		
		IRFY440	—	—	22		
		IRFY9120	—	—	-21		 P-Channel
		IRFY9130	—	—	-37		
		IRFY9140	—	—	-52		
		IRFY9240	—	—	-30		

Source-Drain Diode Ratings and Characteristics (Continued)

	Parameter	Type	Min.	Typ.	Max.	Units	Test Conditions	
V_{SD}	Diode Forward Voltage	IRFY044	—	—	2.5	V	I_S = 20A	T_C = 25°C, V_{GS} = 0V
		IRFY120	—	—	1.8		I_S = 7.3A	
		IRFY130	—	—	1.5		I_S = 11A	
		IRFY140	—	—	1.5		I_S = 18A	
		IRFY240	—	—	1.5		I_S = 12A	
		IRFY340	—	—	1.5		I_S = 6.9A	
		IRFY430	—	—	1.4		I_S = 3.7A	
		IRFY440	—	—	1.5		I_S = 5.5A	
		IRFY9120	—	—	–4.8		I_S = –5.3A	
		IRFY9130	—	—	–4.7		I_S = –9.3A	
		IRFY9140	—	—	–4.2		I_S = –13A	
		IRFY9240	—	—	–4.6		I_S = –7.7A	
t_{rr}	Reverse Recovery Time	IRFY044	—	—	220	ns	I_F = 20A	T_J = 25°C, di/dt ≤ 100A/μs V_{DD} ≤ 50V
		IRFY120	—	—	240		I_S = 7.3A	
		IRFY130	—	—	300		I_S = 11A	
		IRFY140	—	—	400		I_S = 18A	
		IRFY240	—	—	500		I_S = 12A	
		IRFY340	—	—	600		I_S = 6.9A	
		IRFY430	—	—	900		I_S = 3.7A	
		IRFY440	—	—	700		I_S = 5.5A	
		IRFY9120	—	—	200		I_S = –5.3A	T_J = 25°C, di/dt ≤ –100A/μs V_{DD} ≤ –50V
		IRFY9130	—	—	250		I_S = –9.3A	
		IRFY9140	—	—	280		I_S = –13A	
		IRFY9240	—	—	440		I_S = –7.7A	

Source-Drain Diode Ratings and Characteristics (Continued)

Parameter		Type	Min.	Typ.	Max.	Units	Test Conditions	
Q_{rr}	Reverse Recovered Charge	IRFY044	—	—	1.6	μC	I_S = 20A	
		IRFY120	—	—	2.0		I_S = 7.3A	
		IRFY130	—	—	3.0		I_S = 11A	
		IRFY140	—	—	2.4		I_S = 18A	T_J = 25°C, di/dt ≤ 100A/μs
		IRFY240	—	—	5.3		I_S = 12A	V_{DD} ≤ 50V
		IRFY340	—	—	5.6		I_S = 6.9A	
		IRFY430	—	—	7.0		I_S = 3.7A	
		IRFY440	—	—	8.9		I_S = 5.5A	
		IRFY9120	—	—	3.1		I_S = −5.3A	
		IRFY9130	—	—	3.0		I_S = −9.3A	T_J = 25°C, di/dt ≤ −100A/μs
		IRFY9140	—	—	3.6		I_S = −13A	V_{DD} ≤ −50V
		IRFY9240	—	—	7.2		I_S = −7.7A	

Thermal Resistance and Isolation

Parameter		Type	Min.	Typ.	Max.	Units	Test Conditions
R_{thJC}	Junction-to-Case	IRFY044	—	—	2.1	K/W	
		IRFY120	—	—	4.1		
		IRFY130	—	—	2.8		
		IRFY140	—	—	2.1		
		IRFY240	—	—	2.1		
		IRFY340	—	—	2.1		
		IRFY430	—	—	2.8		
		IRFY440	—	—	2.1		
		IRFY9120	—	—	4.1		
		IRFY9130	—	—	2.8		
		IRFY9140	—	—	2.1		
		IRFY9240	—	—	2.1		
R_{thCS}	Case-to-Sink	ALL	—	0.21	—	K/W	Mounting surface flat, smooth
R_{thJA}	Junction-to-Ambient	ALL	—	—	80	K/W	Typical socket mount