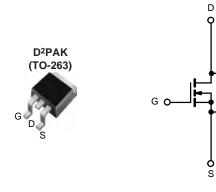


# **IRL3303STRPBF-VB Datasheet** N-Channel 30-V (D-S) MOSFET

PRODUCT SUMMARY						
V <sub>DS</sub> (V)	R <sub>DS(on)</sub> (Ω)	I <sub>D</sub> (A) <sup>a, e</sup>	Q <sub>g</sub> (Typ)			
30	0.012 at V <sub>GS</sub> = 10 V	50	25 nC			
	0.018 at V <sub>GS</sub> = 4.5 V	45	23110			



#### **FEATURES**

- Trench Power MOSFET
- 100 % R<sub>g</sub> and UIS Tested
- Compliant to RoHS Directive 2011/65/EU

#### **APPLICATIONS**

- OR-ing
- Server
- DC/DC

Parameter		Symbol	Limit	Unit	
Drain-Source Voltage	V <sub>DS</sub>	30	V		
Gate-Source Voltage	V <sub>GS</sub>	± 20	v		
	T <sub>C</sub> = 25 °C		50		
Continuous Drain Current (T <sub>.1</sub> = 175 °C)	T <sub>C</sub> = 70 °C		46		
Continuous Drain Current (1j = 175°C)	T <sub>A</sub> = 25 °C	I <sub>D</sub>	27 <sup>b, c</sup>	A	
	T <sub>A</sub> = 70 °C		21 <sup>b, c</sup>	^	
Pulsed Drain Current	I <sub>DM</sub>	210			
Avalanche Current Pulse	L = 0.1 mH	I <sub>AS</sub>	39		
Single Pulse Avalanche Energy	L = 0.1 mm	E <sub>AS</sub>	94.8	mJ	
Continuous Source-Drain Diode Current	T <sub>C</sub> = 25 °C	1	50 <sup>a, e</sup>		
Continuous Source-Drain Diode Current	T <sub>A</sub> = 25 °C	I <sub>S</sub>	3.13 <sup>b, c</sup>	— A	
	T <sub>C</sub> = 25 °C		120 <sup>a</sup>		
Marian Dissisting	T <sub>C</sub> = 70 °C	Р	85		
Maximum Power Dissipation	T <sub>A</sub> = 25 °C	P <sub>D</sub>	3.75 <sup>b, c</sup>	W	
	T <sub>A</sub> = 70 °C		2.63 <sup>b, c</sup>		
Operating Junction and Storage Temperature Ra	T <sub>J</sub> , T <sub>stg</sub>	- 55 to 175	°C		

N-Channel MOSFET

THERMAL RESISTANCE RATINGS						
Parameter		Symbol	Тур.	Max.	Unit	
Maximum Junction-to-Ambient <sup>b, d</sup>	$t \le 10 \text{ sec}$	R <sub>thJA</sub>	32	40	°C/W	
Maximum Junction-to-Case	Steady State	R <sub>thJC</sub>	0.5	0.6	0/10	

Notes:

a. Based on  $T_C = 25 \text{ °C}$ . b. Surface mounted on 1" x 1" FR4 board.

c. t = 10 sec.
d. Maximum under steady state conditions is 90 °C/W.
e. Calculated based on maximum junction temperature. Package limitation current is 90 A.



### IRL3303STRPBF-VB

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Parameter	Symbol	Test Conditions	Min.	Тур.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V <sub>DS</sub>	$V_{GS} = 0 V, I_{D} = 250 \mu A$	30			V
V <sub>DS</sub> Temperature Coefficient	$\Delta V_{DS}/T_{J}$	L _ 250 uA		35		
V <sub>GS(th)</sub> Temperature Coefficient	$\Delta V_{GS(th)}/T_J$	I <sub>D</sub> = 250 μA		- 7.5		mV/°C
Gate-Source Threshold Voltage	V <sub>GS(th)</sub>	$V_{DS} = V_{GS}, I_D = 250 \ \mu A$	1.0		3.0	V
Gate-Source Leakage	I <sub>GSS</sub>	$V_{DS} = 0 \text{ V},  V_{GS} = \pm 20 \text{ V}$			± 100	nA
Zana Cata Maltana Duain Cumant		$V_{DS} = 30 \text{ V}, V_{GS} = 0 \text{ V}$			1	
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	$V_{DS} = 30 \text{ V}, V_{GS} = 0 \text{ V}, T_{J} = 55 \text{ °C}$			10	μA
On-State Drain Current <sup>a</sup>	I <sub>D(on)</sub>	$V_{DS} \ge 5 \text{ V}, V_{GS} = 10 \text{ V}$	90			Α
		V <sub>GS</sub> = 10 V, I <sub>D</sub> = 28.8 A		0.012		0
Drain-Source On-State Resistance <sup>a</sup>	R <sub>DS(on)</sub>	$V_{GS} = 4.5 \text{ V}, \text{ I}_{D} = 37 \text{ A}$	0.018			Ω
Forward Transconductance <sup>a</sup>	9 <sub>fs</sub>	V <sub>DS</sub> = 15 V, I <sub>D</sub> = 28.8 A		160		S
Dynamic <sup>b</sup>						
Input Capacitance	C <sub>iss</sub>			1201		
Output Capacitance	C <sub>oss</sub>	V <sub>DS</sub> = 15 V, V <sub>GS</sub> = 0 V, f = 1 MHz		255		pF
Reverse Transfer Capacitance	C <sub>rss</sub>			170		
Tatal Cata Charge	0	$V_{DS}$ = 15 V, $V_{GS}$ = 10 V, $I_{D}$ = 28.8 A		35		nC
Total Gate Charge	Qg	V <sub>DS</sub> = 15 V, V <sub>GS</sub> = 4.5 V, I <sub>D</sub> = 28.8 A		25		
Gate-Source Charge	Q <sub>gs</sub>			15		
Gate-Drain Charge	Q <sub>gd</sub>			20		
Gate Resistance	R <sub>g</sub>	f = 1 MHz		1.4	2.1	Ω
Turn-On Delay Time	t <sub>d(on)</sub>			18	27	
Rise Time	t <sub>r</sub>	$V_{DD}$ = 15 V, $R_L$ = 0.625 $\Omega$		11	17	
Turn-Off Delay Time	t <sub>d(off)</sub>	$I_D \cong$ 24 A, $V_{GEN}$ = 10 V, $R_g$ = 1 $\Omega$		70	105	
Fall Time	t <sub>f</sub>			10	15	
Turn-On Delay Time	t <sub>d(on)</sub>			55	83	ns
Rise Time	t <sub>r</sub>	$V_{DD}$ = 15 V, $R_L$ = 0.67 $\Omega$		180	270	
Turn-Off Delay Time	t <sub>d(off)</sub>	$\text{I}_\text{D}\cong\text{22.5}$ A, $\text{V}_\text{GEN}$ = 4.5 V, $\text{R}_\text{g}$ = 1 $\Omega$		55	83	
Fall Time	t <sub>f</sub>			12	18	
Drain-Source Body Diode Characteristic	cs					
Continuous Source-Drain Diode Current	۱ <sub>S</sub>	T <sub>C</sub> = 25 °C			120	٨
Pulse Diode Forward Current <sup>a</sup>	I <sub>SM</sub>				120	A
Body Diode Voltage	V <sub>SD</sub>	I <sub>S</sub> = 22 A		0.8	1.2	V
Body Diode Reverse Recovery Time	t <sub>rr</sub>			52	78	ns
Body Diode Reverse Recovery Charge	Q <sub>rr</sub>	$L_{-} = 20$ A di/dt = 100 A/ma T = 25 °C		70.2	105	nC
Reverse Recovery Fall Time	t <sub>a</sub>	$I_F = 20 \text{ A}, \text{ di/dt} = 100 \text{ A/}\mu\text{s}, T_J = 25 \text{ °C}$		27		
Reverse Recovery Rise Time	t <sub>b</sub>			25		ns

Notes:

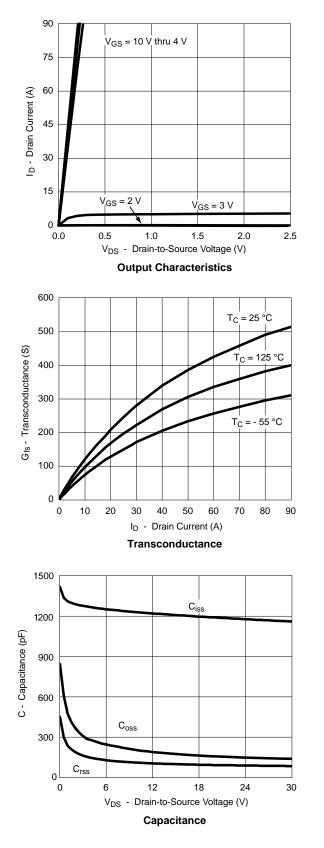
a. Pulse test; pulse width  $\leq 300~\mu s,$  duty cycle  $\leq 2$  %.

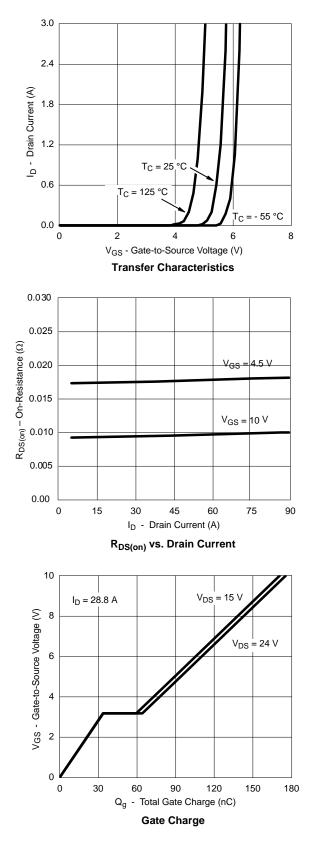
b. Guaranteed by design, not subject to production testing.

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.



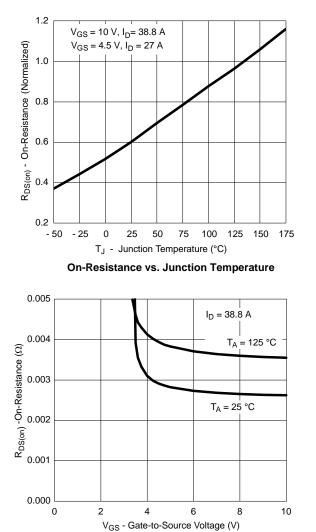
#### TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

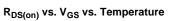


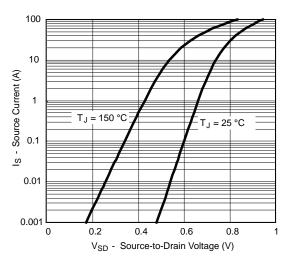




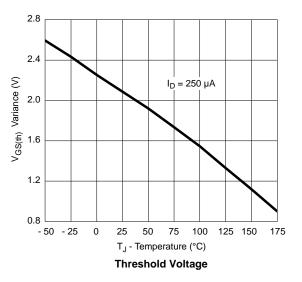
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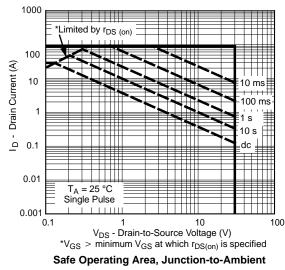




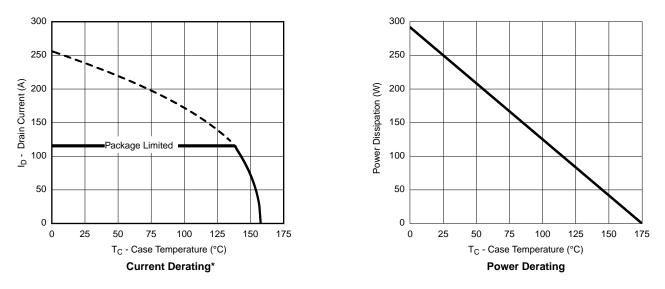






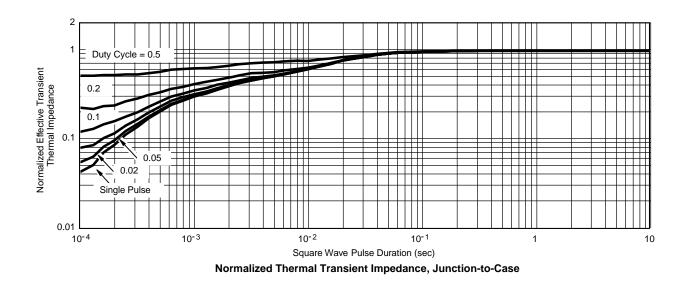






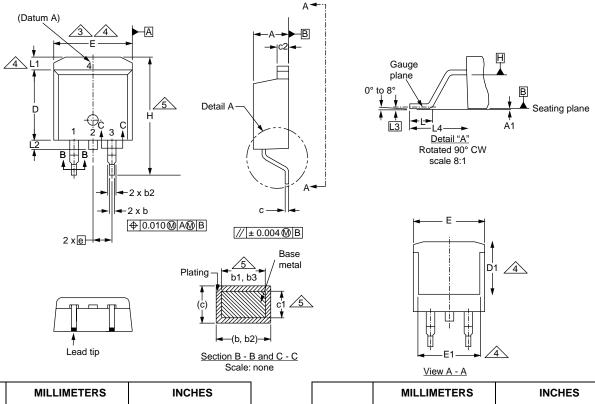
#### TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

\*The power dissipation  $P_D$  is based on  $T_{J(max)} = 175$  °C, using junction-to-case thermal resistance, and is more useful in settling the upper dissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below the package limit.





#### **TO-263AB (HIGH VOLTAGE)**



		VIETERS	INC	HE9			MILLIMETERS		HE9
DIM.	MIN.	MAX.	MIN.	MAX.	DIM.	MIN.	MAX.	MIN.	MAX
А	4.06	4.83	0.160	0.190	D1	6.86	-	0.270	-
A1	0.00	0.25	0.000	0.010	E	9.65	10.67	0.380	0.42
b	0.51	0.99	0.020	0.039	E1	6.22	-	0.245	-
b1	0.51	0.89	0.020	0.035	е	2.54 BSC		0.100 BSC	
b2	1.14	1.78	0.045	0.070	Н	14.61	15.88	0.575	0.62
b3	1.14	1.73	0.045	0.068	L	1.78	2.79	0.070	0.11
С	0.38	0.74	0.015	0.029	L1	-	1.65	-	0.06
c1	0.38	0.58	0.015	0.023	L2	-	1.78	-	0.070
c2	1.14	1.65	0.045	0.065	L3	0.25 BSC		0.010 BSC	
D	8.38	9.65	0.330	0.380	L4	4.78	5.28	0.188	0.20

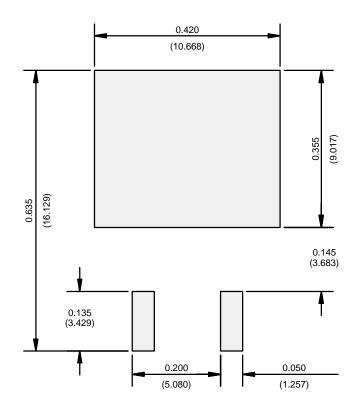
#### Notes

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- 1. Dimensioning and tolerancing per ASME Y14.5M-1994.
- 2. Dimensions are shown in millimeters (inches).
- 3. Dimension D and E do not include mold flash. Mold flash shall not exceed 0.127 mm (0.005") per side. These dimensions are measured at the outmost extremes of the plastic body at datum A.
- 4. Thermal PAD contour optional within dimension E, L1, D1 and E1.
- 5. Dimension b1 and c1 apply to base metal only.
- 6. Datum A and B to be determined at datum plane H.
- 7. Outline conforms to JEDEC outline to TO-263AB.



#### **RECOMMENDED MINIMUM PADS FOR D<sup>2</sup>PAK: 3-Lead**



Recommended Minimum Pads Dimensions in Inches/(mm)



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