


**Static @ T<sub>J</sub> = 25°C (unless otherwise specified)**

	Parameter	Min.	Typ.	Max.	Units	Conditions
V <sub>(BR)DSS</sub>	Drain-to-Source Breakdown Voltage	-100	—	—	V	V <sub>GS</sub> = 0V, I <sub>D</sub> = -250μA
ΔV <sub>(BR)DSS/ΔT<sub>J</sub></sub>	Breakdown Voltage Temp. Coefficient	—	-0.11	—	V/°C	Reference to 25°C, I <sub>D</sub> = -1mA
R <sub>DS(on)</sub>	Static Drain-to-Source On-Resistance	—	—	60	mΩ	V <sub>GS</sub> = -10V, I <sub>D</sub> = -38A ④
V <sub>GS(th)</sub>	Gate Threshold Voltage	-2.0	—	-4.0	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250μA
g <sub>fs</sub>	Forward Trans conductance	9.5	—	—	S	V <sub>DS</sub> = -50V, I <sub>D</sub> = -23A
I <sub>DSS</sub>	Drain-to-Source Leakage Current	—	—	-50	μA	V <sub>DS</sub> = -100V, V <sub>GS</sub> = 0V
		—	—	-250		V <sub>DS</sub> = -80V, V <sub>GS</sub> = 0V, T <sub>J</sub> = 125°C
I <sub>GSS</sub>	Gate-to-Source Forward Leakage	—	—	-100	nA	V <sub>GS</sub> = -20V
	Gate-to-Source Reverse Leakage	—	—	100		V <sub>GS</sub> = 20V

**Dynamic Electrical Characteristics @ T<sub>J</sub> = 25°C (unless otherwise specified)**

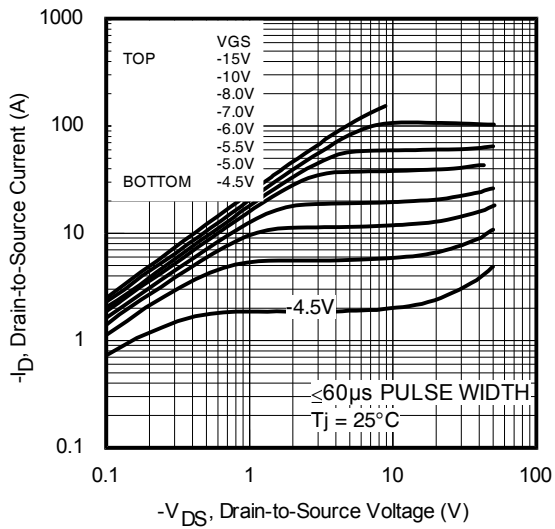
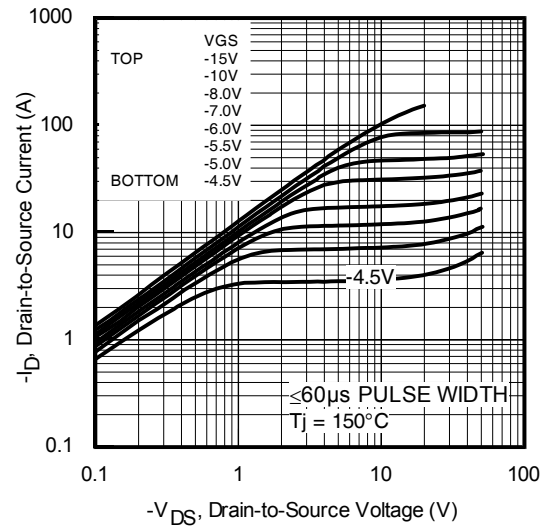
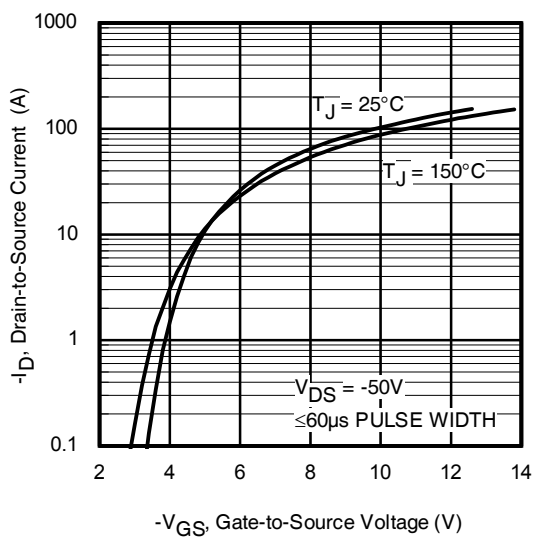
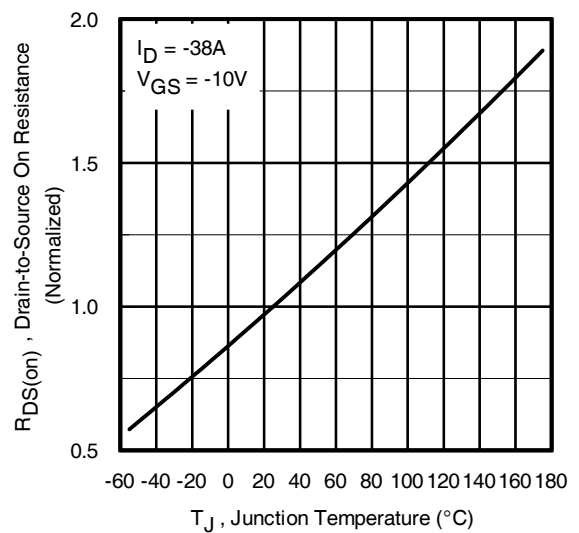
Q <sub>g</sub>	Total Gate Charge	—	150	230	nC	I <sub>D</sub> = -23A
Q <sub>gs</sub>	Gate-to-Source Charge	—	22	33		V <sub>DS</sub> = -80V
Q <sub>gd</sub>	Gate-to-Drain Charge	—	81	120		V <sub>GS</sub> = -10V ④
t <sub>d(on)</sub>	Turn-On Delay Time	—	14	—	ns	V <sub>DD</sub> = -50V
t <sub>r</sub>	Rise Time	—	63	—		I <sub>D</sub> = -23A
t <sub>d(off)</sub>	Turn-Off Delay Time	—	72	—		R <sub>G</sub> = 2.4Ω
t <sub>f</sub>	Fall Time	—	55	—		V <sub>GS</sub> = -10V ④
L <sub>D</sub>	Internal Drain Inductance	—	4.5	—	nH	Between lead, 6mm (0.25in.) from package and center of die contact
L <sub>S</sub>	Internal Source Inductance	—	7.5	—		
C <sub>iss</sub>	Input Capacitance	—	2780	—	pF	V <sub>GS</sub> = 0V
C <sub>oss</sub>	Output Capacitance	—	800	—		V <sub>DS</sub> = -25V
C <sub>rss</sub>	Reverse Transfer Capacitance	—	430	—		f = 1.0MHz, See Fig. 5

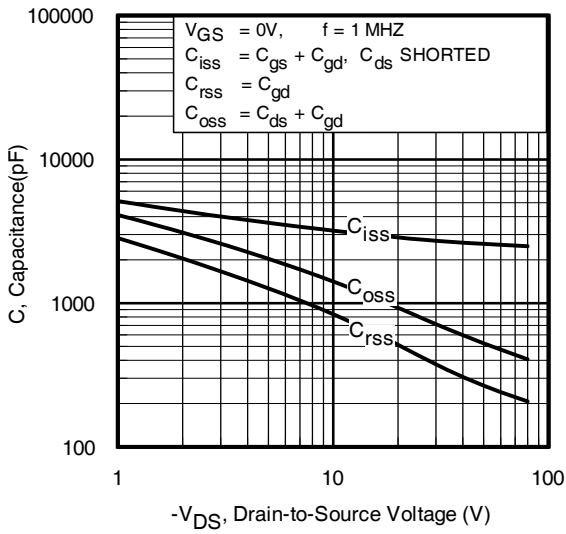
**Diode Characteristics**

	Parameter	Min.	Typ.	Max.	Units	Conditions
I <sub>S</sub>	Continuous Source Current (Body Diode)	—	—	-38	A	MOSFET symbol showing the integral reverse p-n junction diode.
I <sub>SM</sub>	Pulsed Source Current (Body Diode) ①	—	—	-140		
V <sub>SD</sub>	Diode Forward Voltage	—	—	-1.6	V	T <sub>J</sub> = 25°C, I <sub>S</sub> = -23A, V <sub>GS</sub> = 0V ④
t <sub>rr</sub>	Reverse Recovery Time	—	170	260	ns	T <sub>J</sub> = 25°C, I <sub>F</sub> = -23A, V <sub>DD</sub> = -25V
Q <sub>rr</sub>	Reverse Recovery Charge	—	1180	1770	nC	di/dt = -100A/μs ④
t <sub>on</sub>	Forward Turn-On Time	Intrinsic turn-on time is negligible (turn-on is dominated by L <sub>S</sub> +L <sub>D</sub> )				

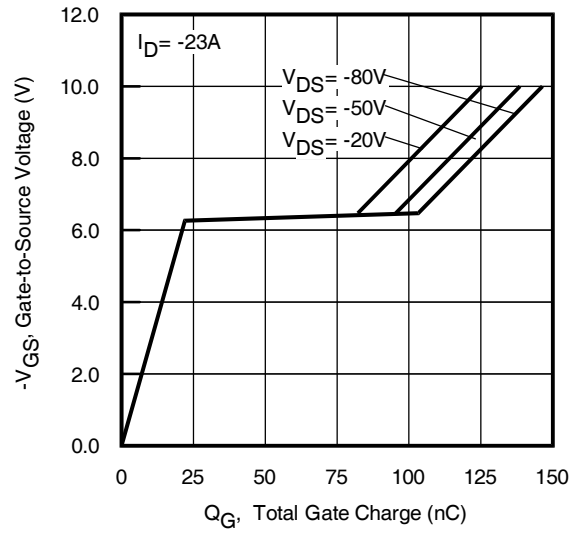
**Notes:**

- ① Repetitive rating; pulse width limited by max. junction temperature. (See fig. 11)
- ② Limited by T<sub>Jmax</sub>, starting T<sub>J</sub> = 25°C, L = 0.46mH, R<sub>G</sub> = 25Ω, I<sub>AS</sub> = -23A. (See Fig. 12)
- ③ I<sub>SD</sub> ≤ -23A, di/dt ≤ -650A/μs, V<sub>DD</sub> ≤ V<sub>(BR)DSS</sub>, T<sub>J</sub> ≤ 150°C.
- ④ Pulse width ≤ 300μs; duty cycle ≤ 2%.
- ⑤ This is applied to D<sup>2</sup>Pak When mounted on 1" square PCB (FR-4 or G-10 Material). For recommended footprint and soldering techniques refer to application note #AN-994
- ⑥ R<sub>θ</sub> is measured at T<sub>J</sub> of approximately 90°C.

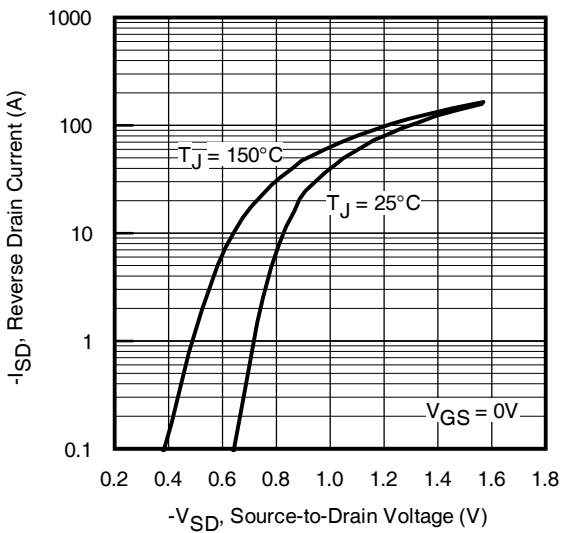

**Fig. 1** Typical Output Characteristics

**Fig. 2** Typical Output Characteristics

**Fig. 3** Typical Transfer Characteristics

**Fig. 4** Normalized On-Resistance vs. Temperature



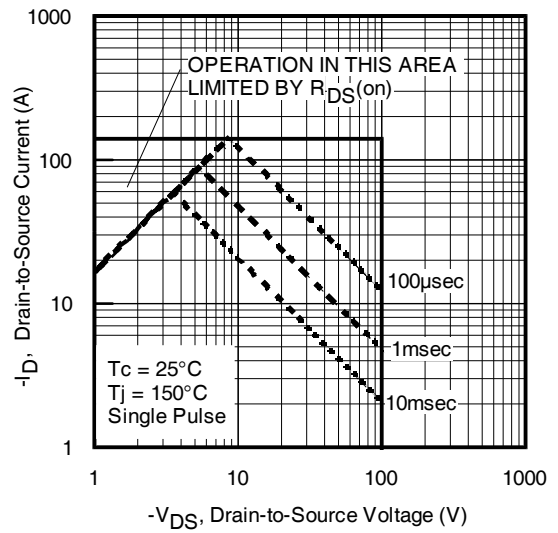
**Fig 5.** Typical Capacitance vs. Drain-to-Source Voltage



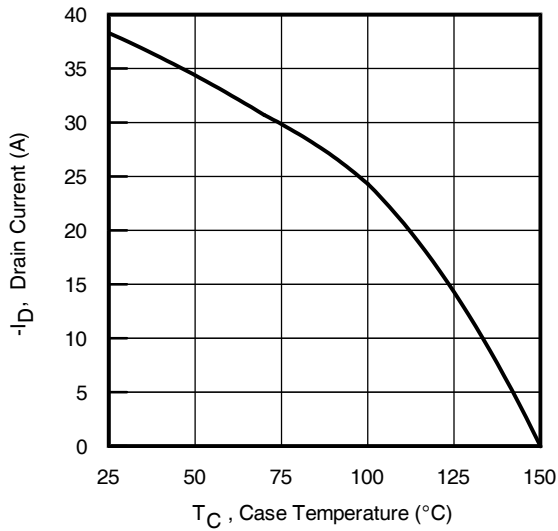
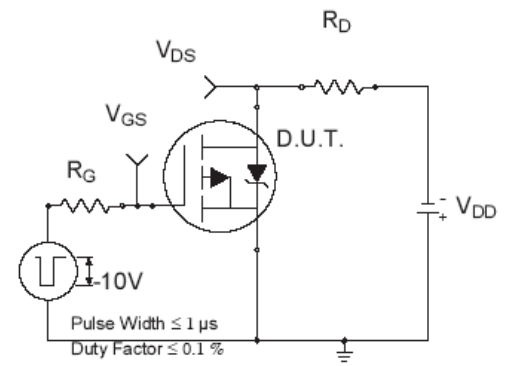
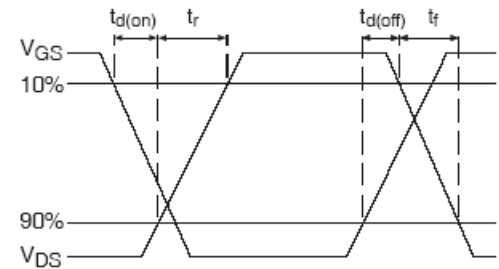
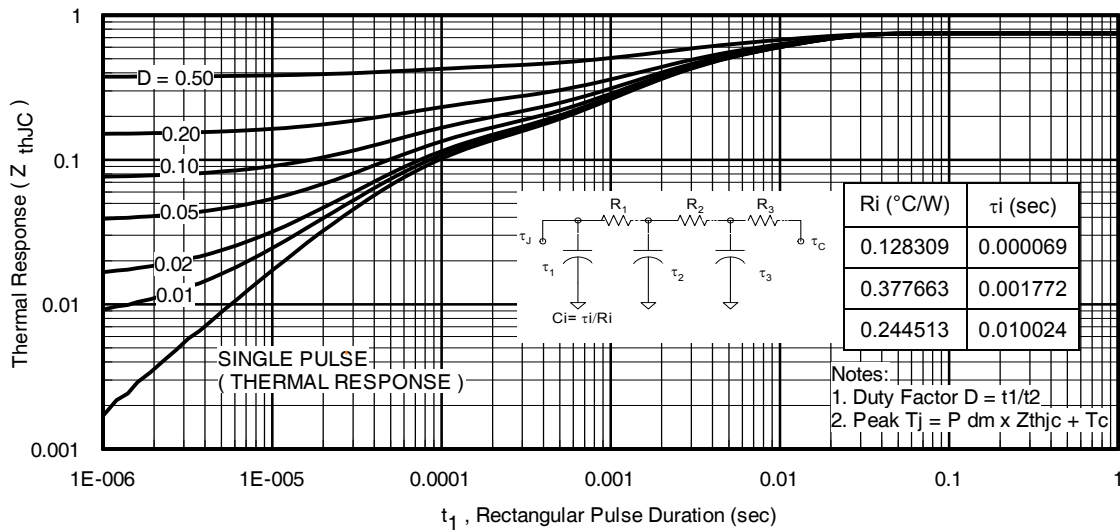
**Fig 6.** Typical Gate Charge vs. Gate-to-Source Voltage

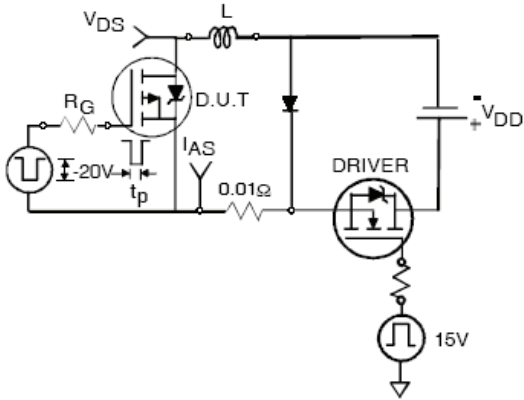
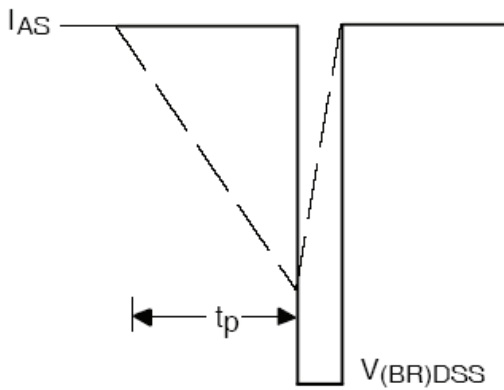
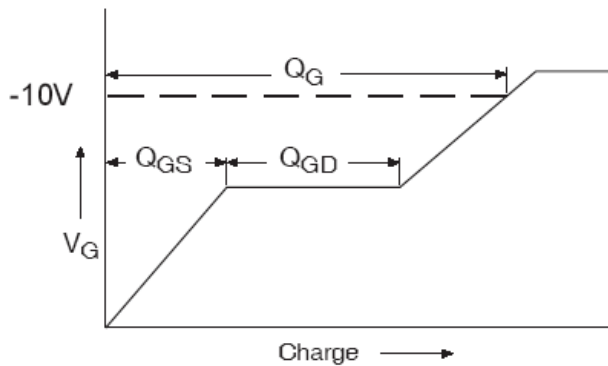
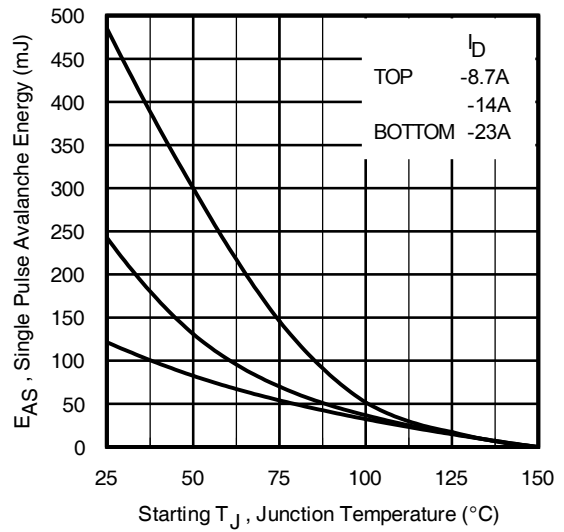
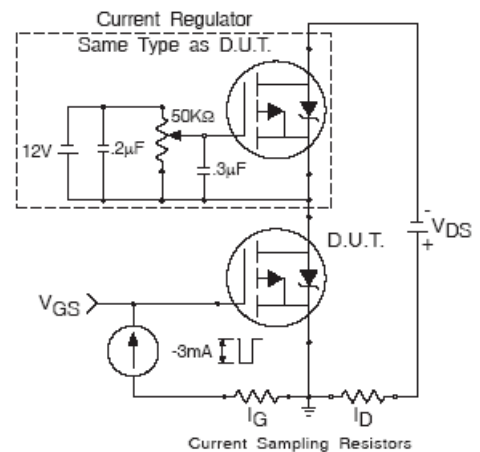


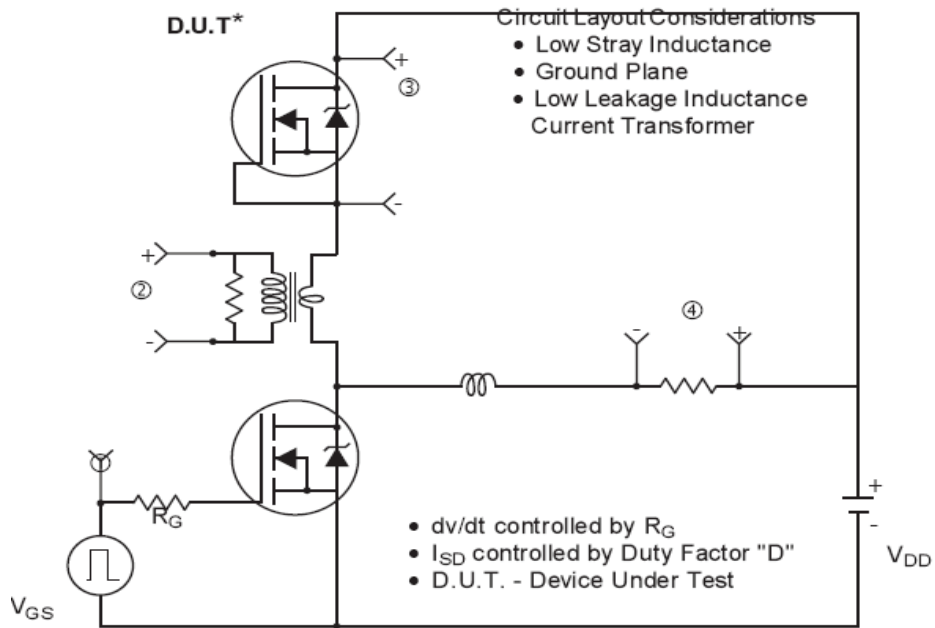
**Fig. 7** Typical Source-to-Drain Diode Forward Voltage



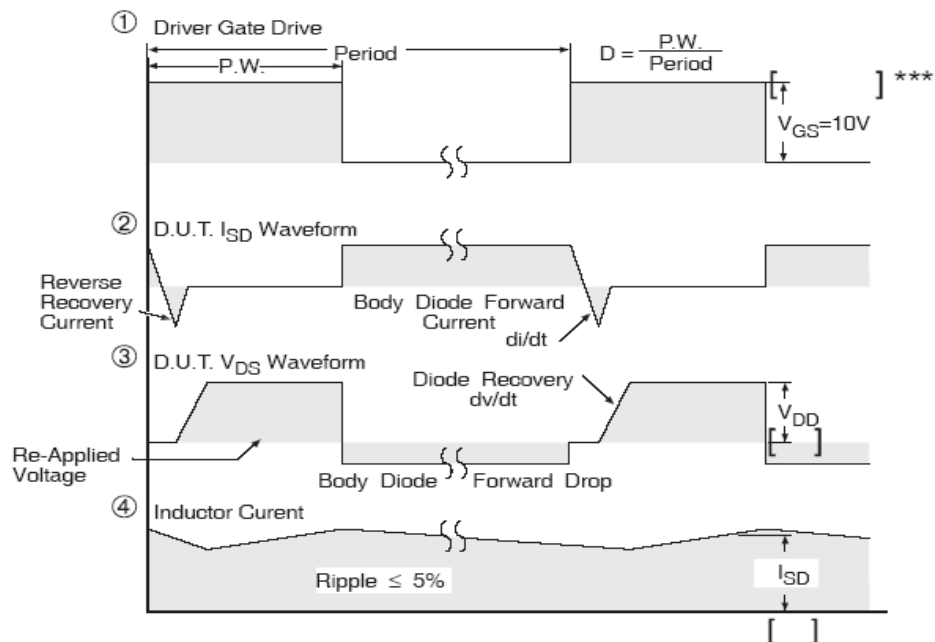
**Fig 8.** Maximum Safe Operating Area


**Fig 9.** Maximum Drain Current vs. Case Temperature

**Fig 10a.** Switching Time Test Circuit

**Fig 10b.** Switching Time Waveforms

**Fig 11.** Maximum Effective Transient Thermal Impedance, Junction-to-Case


**Fig 12a.** Unclamped Inductive Test Circuit

**Fig 12b.** Unclamped Inductive Waveforms

**Fig 14a.** Gate Charge Waveform

**Fig 13.** Maximum Avalanche Energy vs. Drain Current

**Fig 14b.** Gate Charge Test Circuit

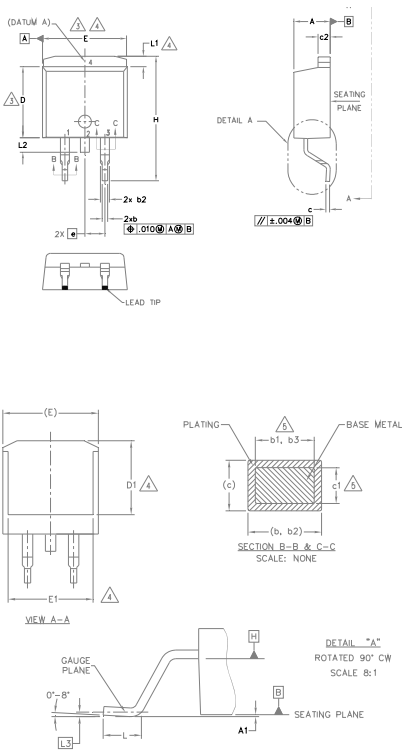


\* Reverse Polarity of D.U.T for P-Channel



\*\*\*  $V_{GS} = 5.0V$  for Logic Level and 3V Drive Devices

**Fig 15.** Peak Diode Recovery  $dv/dt$  Test Circuit for P-Channel HEXFET® Power MOSFETs

**D<sup>2</sup>Pak (TO-263AB) Package Outline (Dimensions are shown in millimeters (inches))**


- NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M-1994
  2. DIMENSIONS ARE SHOWN IN MILLIMETERS [INCHES].
  3. DIMENSION D & E DO NOT INCLUDE MOLD FLASH. MOLD FLASH SHALL NOT EXCEED 0.127 [0.005"] PER SIDE. THESE DIMENSIONS ARE MEASURED AT THE OUTMOST EXTREMES OF THE PLASTIC BODY AT DATUM H.
  4. THERMAL PAD CONTOUR OPTIONAL WITHIN DIMENSION E, L1, D1 & E1.
  5. DIMENSION b1, b3 AND c1 APPLY TO BASE METAL ONLY.
  6. DATUM A & B TO BE DETERMINED AT DATUM PLANE H.
  7. CONTROLLING DIMENSION: INCH.
  8. OUTLINE CONFORMS TO JEDEC OUTLINE TO-263AB.

SYMBOL	DIMENSIONS				NOTES
	MILLIMETERS		INCHES		
	MIN.	MAX.	MIN.	MAX.	
A	4.06	4.83	.160	.190	
A1	0.00	0.254	.000	.010	
b	0.51	0.99	.020	.039	
b1	0.51	0.89	.020	.035	5
b2	1.14	1.78	.045	.070	
b3	1.14	1.73	.045	.068	5
c	0.38	0.74	.015	.029	
c1	0.38	0.58	.015	.023	5
c2	1.14	1.65	.045	.065	
D	8.38	9.65	.330	.380	3
D1	6.86	—	.270	—	4
E	9.65	10.67	.380	.420	3,4
E1	6.22	—	.245	—	4
e	2.54 BSC		.100 BSC		
H	14.61	15.88	.575	.625	
L	1.78	2.79	.070	.110	
L1	—	1.68	—	.066	
L2	—	1.78	—	.070	4
L3	0.25 BSC		.010 BSC		

**LEAD ASSIGNMENTS**
**DIODES**

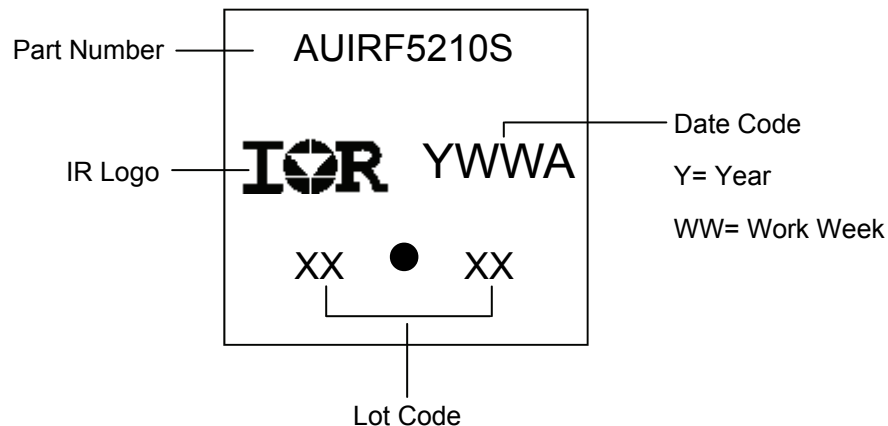
- 1.- ANODE (TWO DIE) / OPEN (ONE DIE)
- 2.- CATHODE
- 3.- ANODE

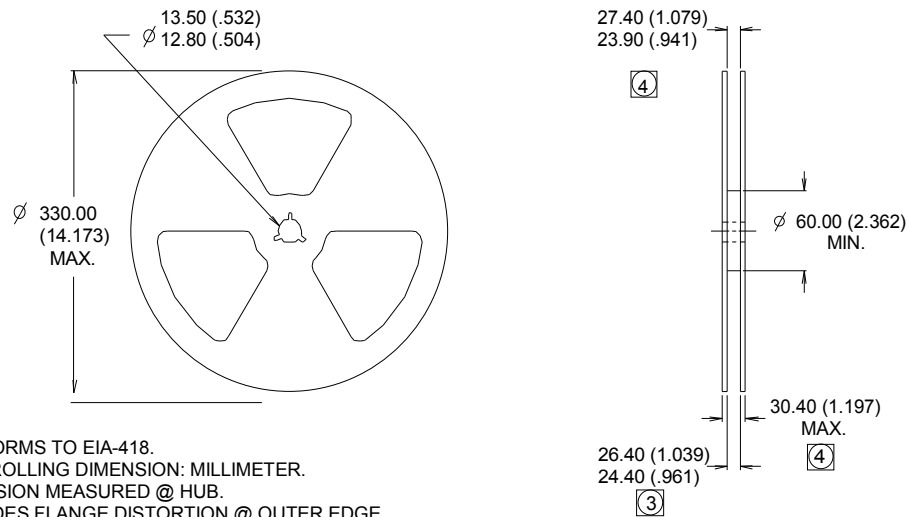
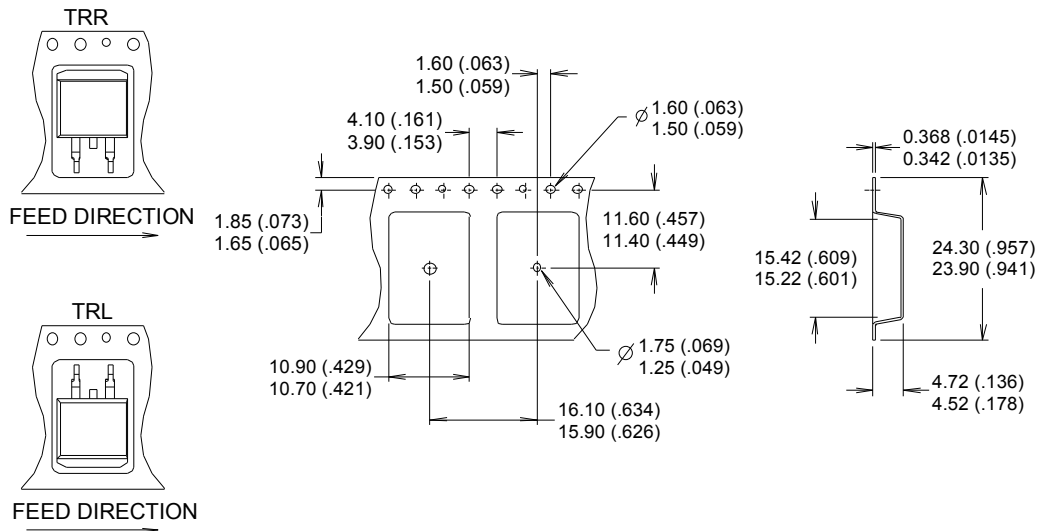
**HEXFET**

- 1.- GATE
- 2.- DRAIN
- 3.- SOURCE

**IGBTs, CoPACK**

- 1.- GATE
- 2.- COLLECTOR
- 3.- EMITTER

**D<sup>2</sup>Pak (TO-263AB) Part Marking Information**


**D<sup>2</sup>Pak (TO-263AB) Tape & Reel Information (Dimensions are shown in millimeters (inches))**


- NOTES :
1. COMFORMS TO EIA-418.
  2. CONTROLLING DIMENSION: MILLIMETER.
  - ④ DIMENSION MEASURED @ HUB.
  - ③ INCLUDES FLANGE DISTORTION @ OUTER EDGE.



**Qualification Information**

<b>Qualification Level</b>		Automotive (per AEC-Q101)	
		Comments: This part number(s) passed Automotive qualification. Infineon's Industrial and Consumer qualification level is granted by extension of the higher Automotive level.	
<b>Moisture Sensitivity Level</b>		D <sup>2</sup> -Pak	MSL1
<b>ESD</b>	Machine Model	Class M4 (+/-425V) <sup>†</sup> AEC-Q101-002	
	Human Body Model	Class H2 (/ -4000V) <sup>†</sup> AEC-Q101-001	
	Charged Device Model	Class C5 (/ -1125V) <sup>†</sup> AEC-Q101-005	
<b>RoHS Compliant</b>		Yes	

† Highest passing voltage.

**Revision History**

Date	Comments
9/30/2015	<ul style="list-style-type: none"> <li>Updated datasheet with corporate template</li> <li>Corrected ordering table on page 1.</li> </ul>
10/15/2019	<ul style="list-style-type: none"> <li>Correted typo on part marking from "AU5210S" to "AUIRF5210S" page 8.</li> </ul>

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