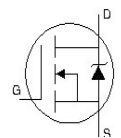


Static @ $T_J = 25^\circ\text{C}$ (unless otherwise specified)

	Parameter	Min.	Typ.	Max.	Units	Conditions
BV_{DSS}	Drain-to-Source Breakdown Voltage	20	—	—	V	$V_{GS} = 0V, I_D = 250\mu A$
$\Delta BV_{DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	—	14	—	mV/ $^\circ\text{C}$	Reference to $25^\circ\text{C}, I_D = 1\text{mA}$
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	—	1.65	2.2	m Ω	$V_{GS} = 10V, I_D = 30A$ ⑤
		—	2.2	3.0		$V_{GS} = 4.5V, I_D = 24A$ ⑤
$V_{GS(th)}$	Gate Threshold Voltage	1.55	—	2.45	V	$V_{DS} = V_{GS}, I_D = 250\mu A$
$\Delta V_{GS(th)}/\Delta T_J$	Gate Threshold Voltage Coefficient	—	-5.8	—	mV/ $^\circ\text{C}$	
I_{DSS}	Drain-to-Source Leakage Current	—	—	1.0	μA	$V_{DS} = 16V, V_{GS} = 0V$
		—	—	150		$V_{DS} = 16V, V_{GS} = 0V, T_J = 125^\circ\text{C}$
I_{GSS}	Gate-to-Source Forward Leakage	—	—	100	nA	$V_{GS} = 20V$
	Gate-to-Source Reverse Leakage	—	—	-100		$V_{GS} = -20V$
g_{fs}	Forward Transconductance	89	—	—	S	$V_{DS} = 10V, I_D = 24A$
Q_g	Total Gate Charge	—	38	57	nC	$V_{DS} = 10V$ $V_{GS} = 4.5V$ $I_D = 16A$ See Fig. 18
Q_{gs1}	Pre-Vth Gate-to-Source Charge	—	10.2	—		
Q_{gs2}	Post-Vth Gate-to-Source Charge	—	3.5	—		
Q_{gd}	Gate-to-Drain Charge	—	13.2	—		
Q_{godr}	Gate Charge Overdrive	—	11.1	—		
Q_{sw}	Switch Charge ($Q_{gs2} + Q_{gd}$)	—	16.7	—		
Q_{oss}	Output Charge	—	22	—	nC	$V_{DS} = 10V, V_{GS} = 0V$
R_G	Gate Resistance	—	—	2.3	Ω	
$t_{d(on)}$	Turn-On Delay Time	—	21	—	ns	$V_{DD} = 16V, V_{GS} = 4.5V$ ⑤ $I_D = 24A$ Clamped Inductive Load
t_r	Rise Time	—	71	—		
$t_{d(off)}$	Turn-Off Delay Time	—	25	—		
t_f	Fall Time	—	9.3	—		
C_{iss}	Input Capacitance	—	5040	—	pF	$V_{GS} = 0V$ $V_{DS} = 10V$ $f = 1.0\text{MHz}$
C_{oss}	Output Capacitance	—	1580	—		
C_{rss}	Reverse Transfer Capacitance	—	780	—		

Diode Characteristics

	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current @ $T_C=25^\circ\text{C}$ (Body Diode)	—	—	110	A	MOSFET symbol showing the integral reverse p-n junction diode.
I_{SM}	Pulsed Source Current (Body Diode) ③	—	—	240		
V_{SD}	Diode Forward Voltage	—	0.8	1.0	V	$T_J = 25^\circ\text{C}, I_S = 24A, V_{GS} = 0V$ ⑤
t_{rr}	Reverse Recovery Time	—	29	44	ns	$T_J = 25^\circ\text{C}, I_F = 24A$
Q_{rr}	Reverse Recovery Charge	—	18	27	nC	$di/dt = 100A/\mu s$ ⑤



Notes:

③ Repetitive rating; pulse width limited by max. junction temperature.

⑤ Pulse width $\leq 400\mu s$; duty cycle $\leq 2\%$.

Absolute Maximum Ratings

	Parameter	Max.	Units
P _D @T _A = 25°C	Power Dissipation ⑥	2.8	W
P _D @T _A = 70°C	Power Dissipation ⑥	1.8	
P _D @T _C = 25°C	Power Dissipation ⑨	89	
T _P	Peak Soldering Temperature	270	°C
T _J	Operating Junction and	-40 to + 150	
T _{STG}	Storage Temperature Range		

Thermal Resistance

	Parameter	Typ.	Max.	Units
$R_{\theta JA}$	Junction-to-Ambient ⑥⑩	—	45	$^\circ\text{C/W}$
$R_{\theta JA}$	Junction-to-Ambient ⑦⑩	12.5	—	
$R_{\theta JA}$	Junction-to-Ambient ⑧⑩	20	—	
$R_{\theta JC}$	Junction-to-Case ⑨⑩	—	1.4	
$R_{\theta J-PCB}$	Junction-to-PCB Mounted	1.0	—	
	Linear Derating Factor ⑥	0.017		$\text{W}/^\circ\text{C}$

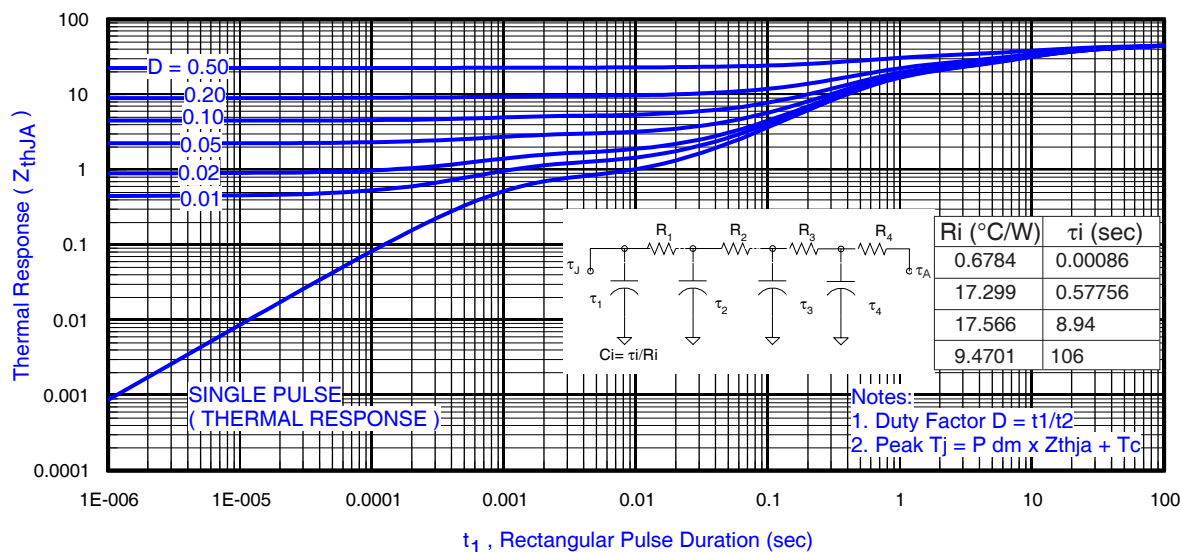
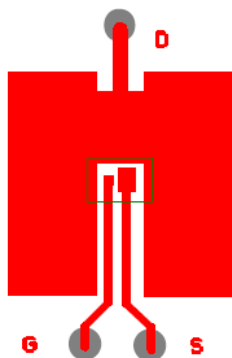


Fig 3. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient ⑥

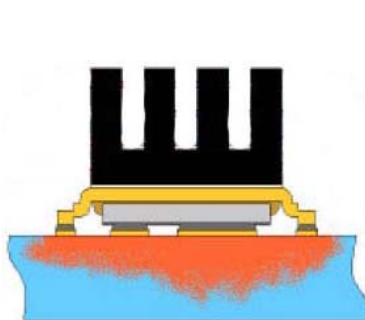
Notes:

- ⑥ Surface mounted on 1 in. square Cu board, steady state.
- ⑦ Used double sided cooling, mounting pad.
- ⑧ Mounted on minimum footprint full size board with metalized back and with small clip heatsink.

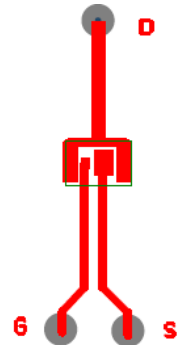
- ⑨ T_C measured with thermocouple incontact with top (Drain) of part.
- ⑩ R_{θ} is measured at T_J of approximately 90°C .



⑥ Surface mounted on 1 in. square Cu board (still air).



⑦ Mounted to a PCB with a thin gap filler and heat sink. (still air)



⑧ Mounted on minimum footprint full size board with metalized back and with small clip heatsink (still air)

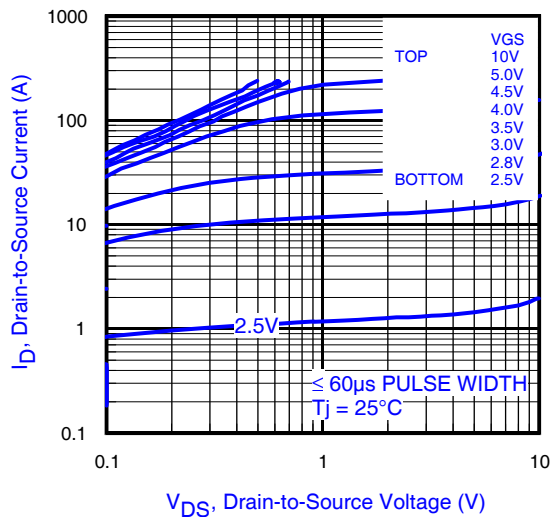


Fig 4. Typical Output Characteristics

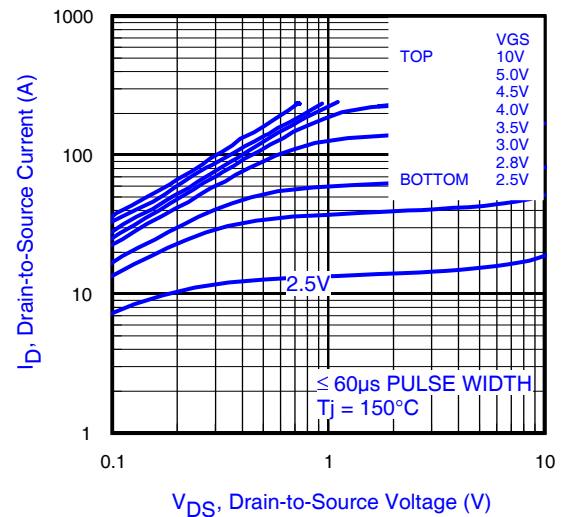


Fig 5. Typical Output Characteristics

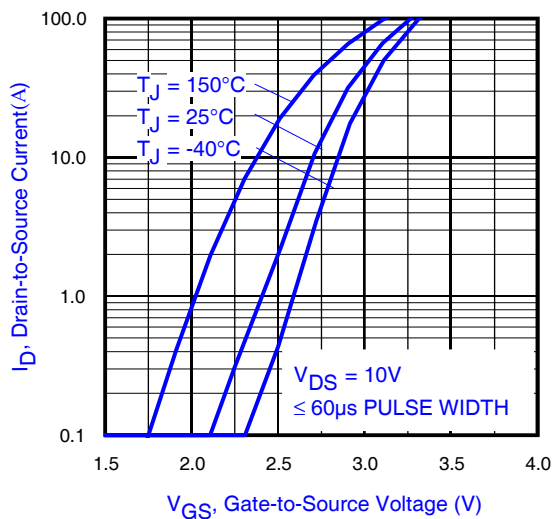


Fig 6. Typical Transfer Characteristics

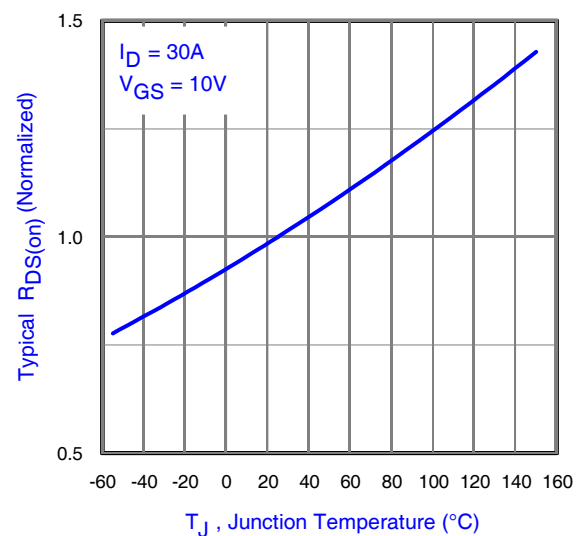


Fig 7. Normalized On-Resistance vs. Temperature

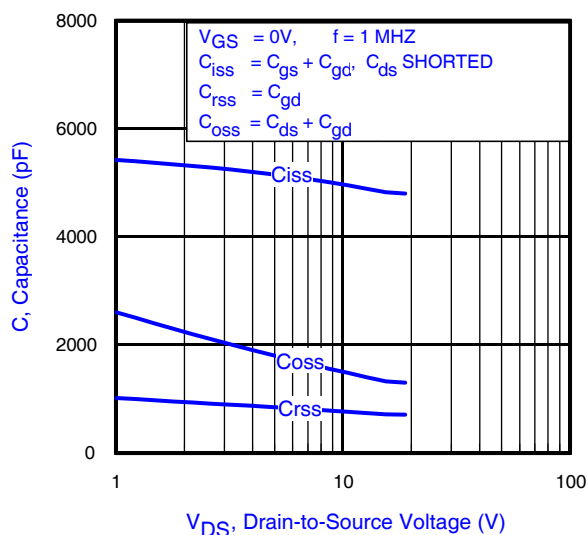


Fig 8. Typical Capacitance vs. Drain-to-Source Voltage

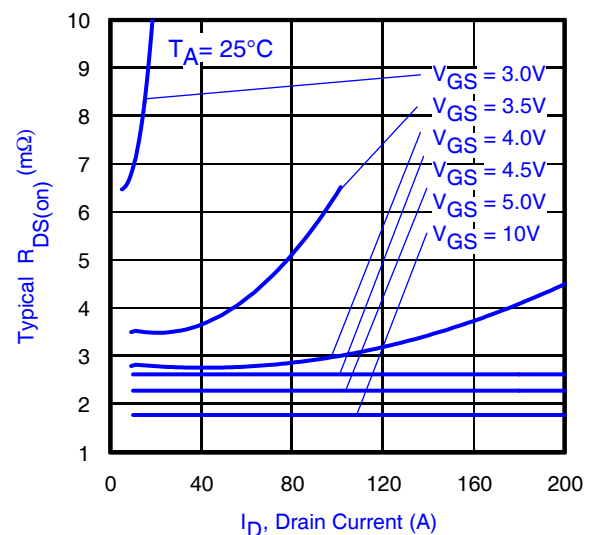


Fig 9. Typical On-Resistance Vs. Drain Current and Gate Voltage

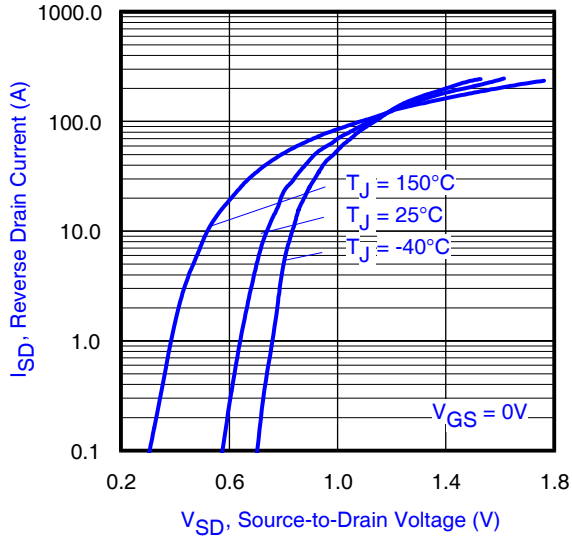


Fig 10. Typical Source-Drain Diode Forward Voltage

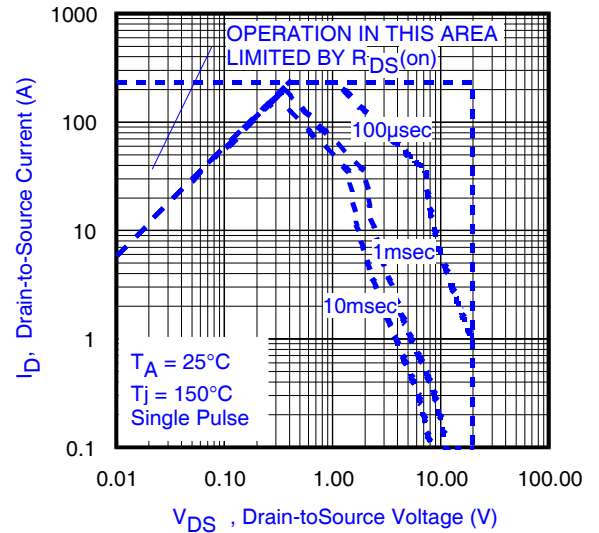


Fig11. Maximum Safe Operating Area

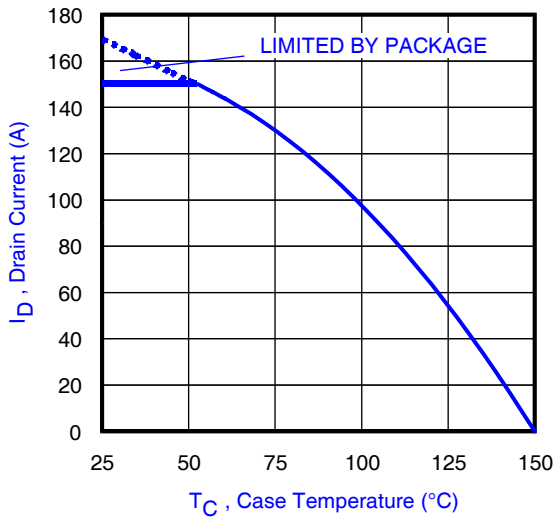


Fig 12. Maximum Drain Current vs. Case Temperature

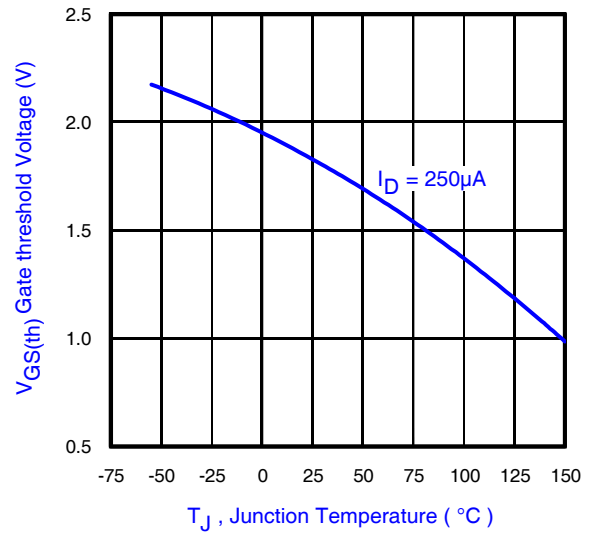


Fig 13. Typical Threshold Voltage vs. Junction Temperature

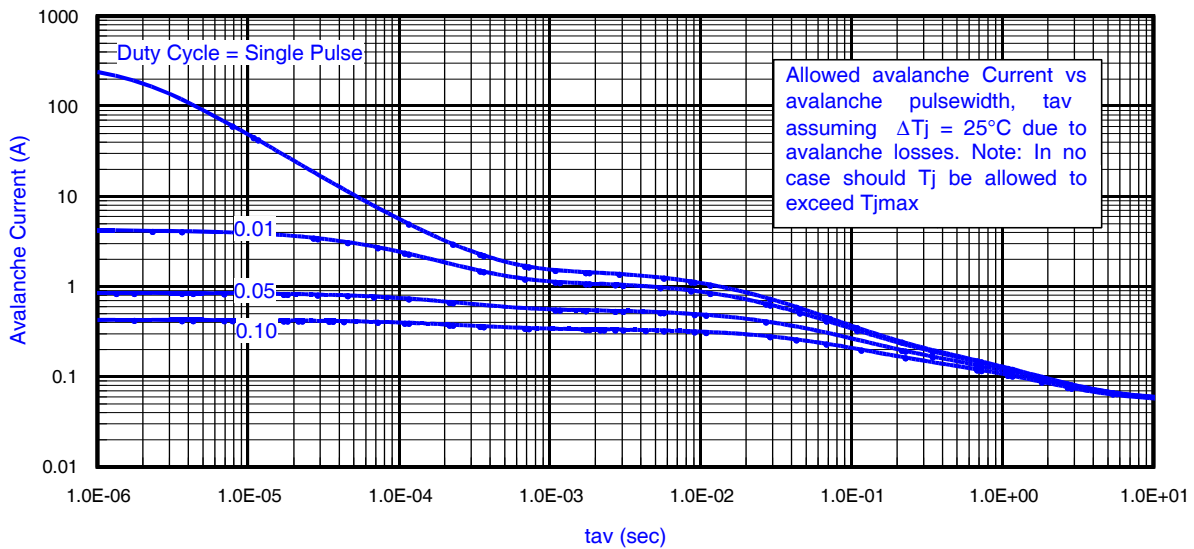


Fig 14. Typical Avalanche Current vs. Pulsewidth

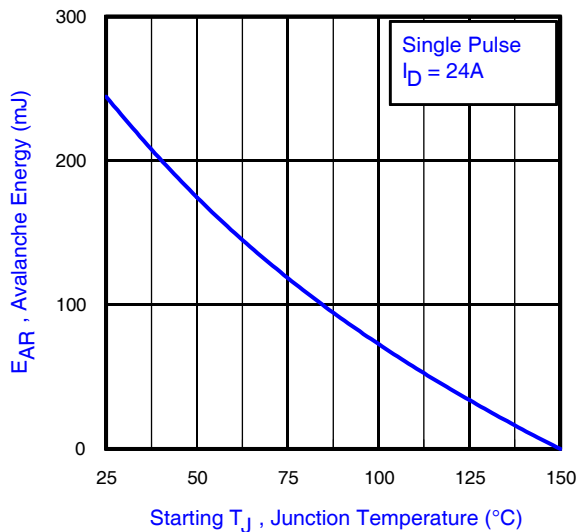


Fig 15. Maximum Avalanche Energy vs. Temperature

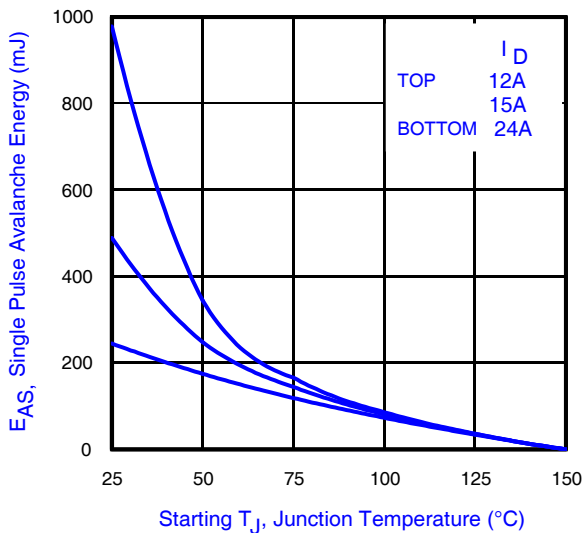


Fig 16. Maximum Avalanche Energy Vs. Drain Current

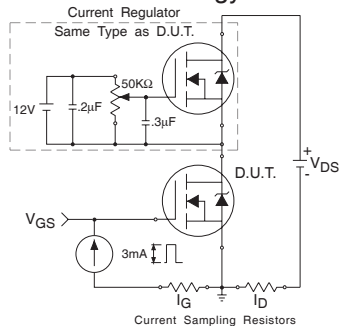


Fig 18a. Gate Charge Test Circuit

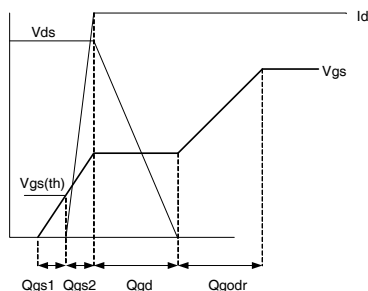


Fig 18b. Gate Charge Waveform

Notes on Repetitive Avalanche Curves , Figures 14, 15:
(For further info, see AN-1005 at www.irf.com)

1. Avalanche failures assumption:
Purely a thermal phenomenon and failure occurs at a temperature far in excess of T_{jmax} . This is validated for every part type.
2. Safe operation in Avalanche is allowed as long as T_{jmax} is not exceeded.
3. Equation below based on circuit and waveforms shown in Figures 17a, 17b.
4. $P_{D(ave)}$ = Average power dissipation per single avalanche pulse.
5. BV = Rated breakdown voltage (1.3 factor accounts for voltage increase during avalanche).
6. I_{av} = Allowable avalanche current.
7. ΔT = Allowable rise in junction temperature, not to exceed T_{jmax} (assumed as 25°C in Figure 14, 15).
 t_{av} = Average time in avalanche.
 D = Duty cycle in avalanche = $t_{av} \cdot f$
 $Z_{thJC}(D, t_{av})$ = Transient thermal resistance, see Figures 3)

$$P_{D(ave)} = 1/2 (1.3 \cdot BV \cdot I_{av}) = \Delta T / Z_{thJC}$$

$$I_{av} = 2\Delta T / [1.3 \cdot BV \cdot Z_{th}]$$

$$E_{AS(AR)} = P_{D(ave)} \cdot t_{av}$$

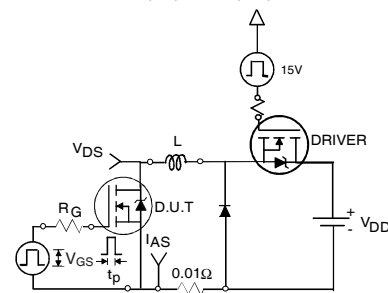


Fig 17a. Unclamped Inductive Test Circuit

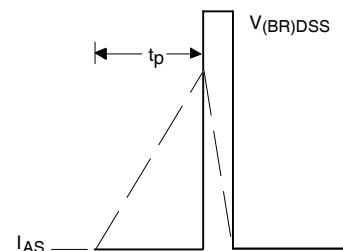


Fig 17b. Unclamped Inductive Waveforms

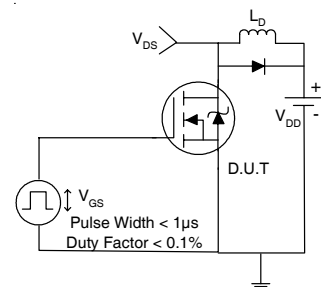


Fig 19a. Switching Time Test Circuit

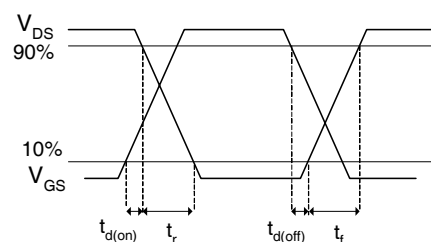


Fig 19b. Switching Time Waveforms

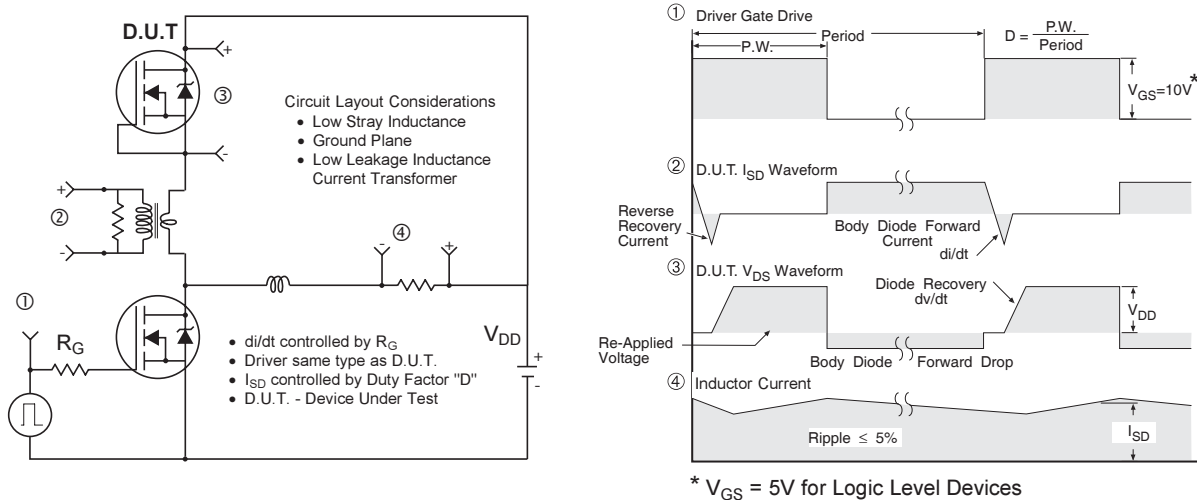
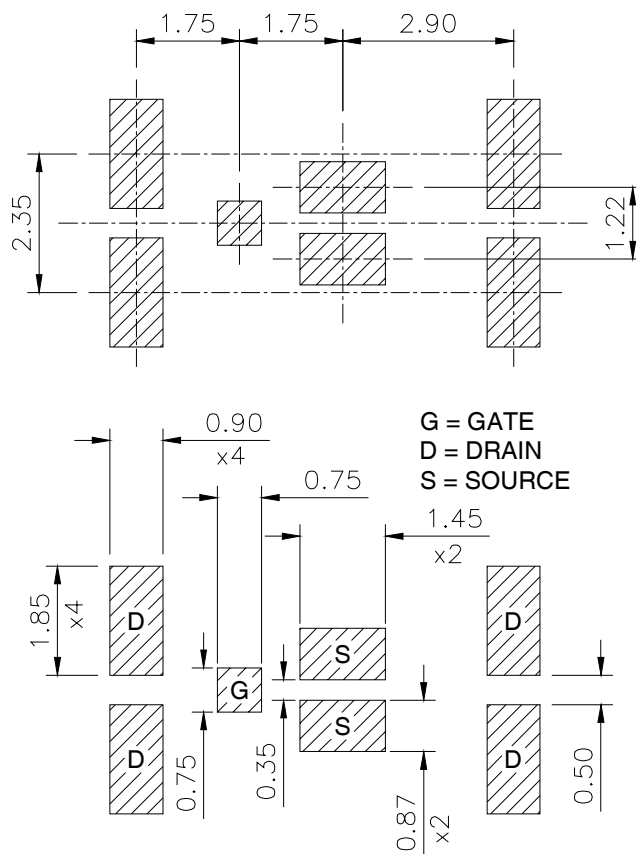


Fig 20. Diode Reverse Recovery Test Circuit for N-Channel HEXFET® Power MOSFETs

DirectFET™ Substrate and PCB Layout, MX Outline (Medium Size Can, X-Designation).

Please see DirectFET application note AN-1035 for all details regarding the assembly of DirectFET.

This includes all recommendations for stencil and substrate designs.

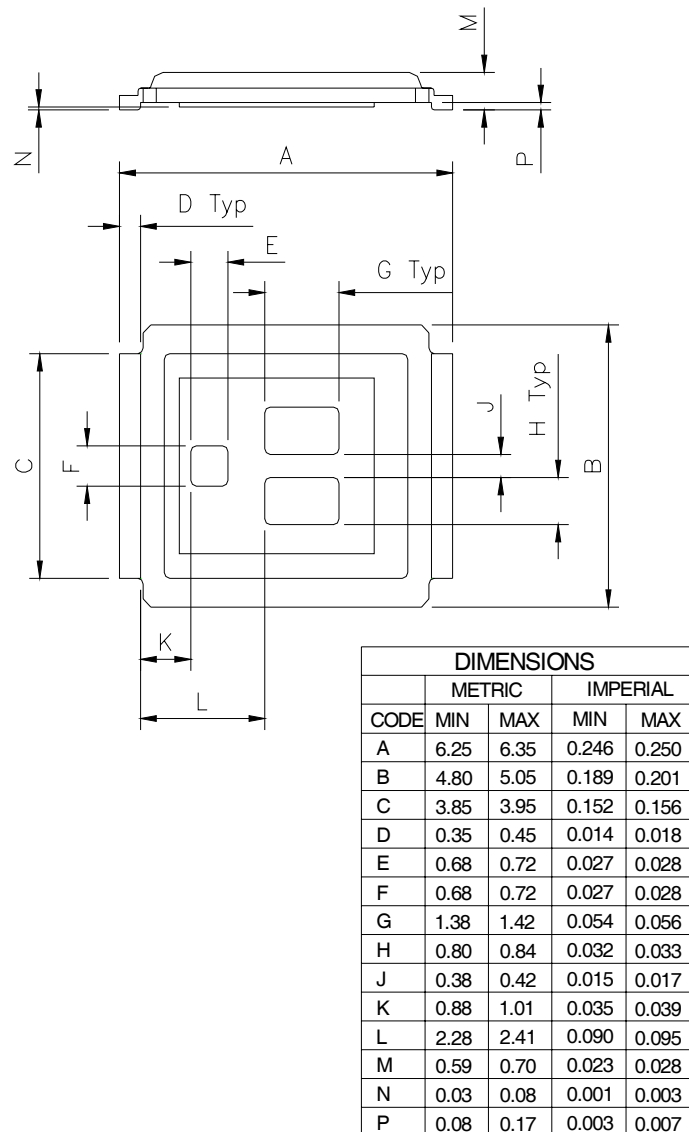


IRF6619

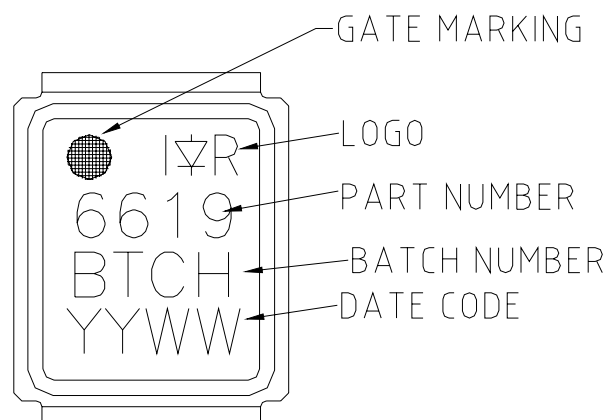
DirectFET™ Outline Dimension, MX Outline (Medium Size Can, X-Designation).

Please see DirectFET application note AN-1035 for all details regarding the assembly of DirectFET.

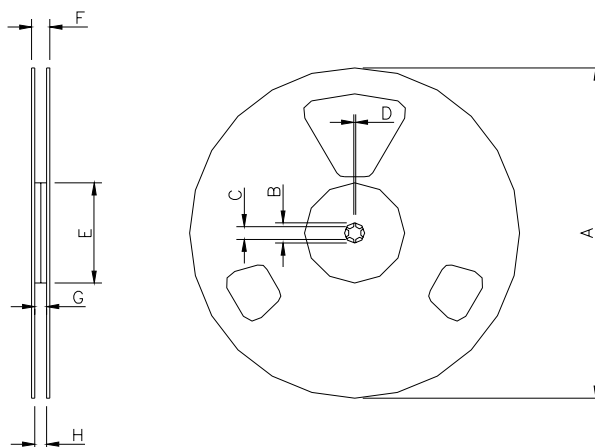
This includes all recommendations for stencil and substrate designs.



DirectFET™ Part Marking



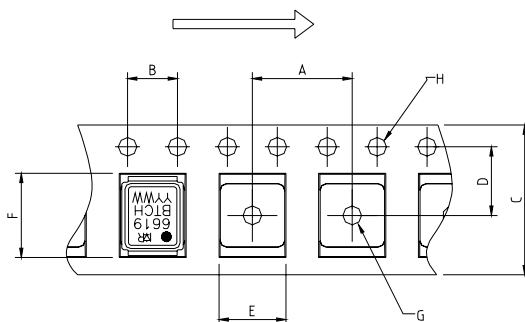
DirectFET™ Tape & Reel Dimension (Showing component orientation).



NOTE: Controlling dimensions in mm
Std reel quantity is 4800 parts. (ordered as IRF6619). For 1000 parts on 7" reel, order IRF6619TR1

REEL DIMENSIONS								
STANDARD OPTION (QTY 4800)					TR1 OPTION (QTY 1000)			
	METRIC		IMPERIAL		METRIC		IMPERIAL	
CODE	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX
A	330.0	N.C	12.992	N.C	177.77	N.C	6.9	N.C
B	20.2	N.C	0.795	N.C	19.06	N.C	0.75	N.C
C	12.8	13.2	0.504	0.520	13.5	12.8	0.53	0.50
D	1.5	N.C	0.059	N.C	1.5	N.C	0.059	N.C
E	100.0	N.C	3.937	N.C	58.72	N.C	2.31	N.C
F	N.C	18.4	N.C	0.724	N.C	13.50	N.C	0.53
G	12.4	14.4	0.488	0.567	11.9	12.01	0.47	N.C
H	11.9	15.4	0.469	0.606	11.9	12.01	0.47	N.C

LOADED TAPE FEED DIRECTION



NOTE: CONTROLLING DIMENSIONS IN MM

DIMENSIONS				
	METRIC		IMPERIAL	
CODE	MIN	MAX	MIN	MAX
A	7.90	8.10	0.311	0.319
B	3.90	4.10	0.154	0.161
C	11.90	12.30	0.469	0.484
D	5.45	5.55	0.215	0.219
E	5.10	5.30	0.201	0.209
F	6.50	6.70	0.256	0.264
G	1.50	N.C	0.059	N.C
H	1.50	1.60	0.059	0.063

Data and specifications subject to change without notice.
This product has been designed and qualified for the Consumer market.
Qualification Standards can be found on IR's Web site.

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Note: For the most current drawings please refer to the IR website at:
<http://www.irf.com/package/>