

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

	Parameter	Min.	Typ.	Max.	Units	Conditions
BV_{DSS}	Drain-to-Source Breakdown Voltage	40	—	—	V	$V_{GS} = 0V, I_D = 250\mu A$
$\Delta BV_{DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	—	38	—	mV/ $^\circ\text{C}$	Reference to 25°C , $I_D = 1\text{mA}$
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	—	2.6	3.4	m Ω	$V_{GS} = 10V, I_D = 23A$ ③
		—	3.1	4.1		$V_{GS} = 4.5V, I_D = 18A$ ③
$V_{GS(th)}$	Gate Threshold Voltage	1.35	—	2.25	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	$V_{DS} = 32V, V_{GS} = 0V$
		—	—	150		$V_{DS} = 32V, V_{GS} = 0V, T_J = 125^\circ\text{C}$
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	93	—	—	S	$V_{DS} = 15V, I_D = 18A$
Q_g	Total Gate Charge	—	42	63	nC	$V_{DS} = 20V$ $V_{GS} = 4.5V$ $I_D = 18A$ See Fig. 6 and 16
Q_{gs1}	Pre-Vth Gate-to-Source Charge	—	11.5	—		
Q_{gs2}	Post-Vth Gate-to-Source Charge	—	3.3	—		
Q_{gd}	Gate-to-Drain Charge	—	12.6	—		
Q_{godr}	Gate Charge Overdrive	—	14.6	—		
Q_{sw}	Switch Charge ($Q_{gs2} + Q_{gd}$)	—	15.9	—	nC	$V_{DS} = 16V, V_{GS} = 0V$
Q_{oss}	Output Charge	—	22	—		
$t_{d(on)}$	Turn-On Delay Time	—	18	—	ns	$V_{DD} = 16V, V_{GS} = 4.5V$ ③ $I_D = 18A$ Clamped Inductive Load
t_r	Rise Time	—	47	—		
$t_{d(off)}$	Turn-Off Delay Time	—	27	—		
t_f	Fall Time	—	4.9	—		
C_{iss}	Input Capacitance	—	5950	—	pF	$V_{GS} = 0V$ $V_{DS} = 15V$ $f = 1.0\text{MHz}$
C_{oss}	Output Capacitance	—	990	—		
C_{rss}	Reverse Transfer Capacitance	—	460	—		

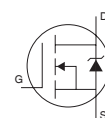
Diode Characteristics

	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	—	—	110	A	MOSFET symbol showing the integral reverse p-n junction diode.
I_{SM}	Pulsed Source Current (Body Diode) ①	—	—	180		
V_{SD}	Diode Forward Voltage	—	—	1.0	V	$T_J = 25^\circ\text{C}, I_S = 18A, V_{GS} = 0V$ ③
t_{rr}	Reverse Recovery Time	—	38	57	ns	$T_J = 25^\circ\text{C}, I_F = 18A$
Q_{rr}	Reverse Recovery Charge	—	42	63	nC	$di/dt = 100A/\mu s$ ③

Notes:

- ① Repetitive rating; pulse width limited by max. junction temperature.
- ② Starting $T_J = 25^\circ\text{C}$, $L = 1.2\text{mH}$, $R_G = 25\Omega$, $I_{AS} = 18A$.
- ③ Pulse width $\leq 400\mu s$; duty cycle $\leq 2\%$.
- ④ Surface mounted on 1 in. square Cu board.

- ⑤ Used double sided cooling, mounting pad.
- ⑥ Mounted on minimum footprint full size board with metalized back and with small clip heatsink.
- ⑦ T_C measured with thermal couple mounted to top (Drain) of part.
- ⑧ R_{θ} is measured at T_J of approximately 90°C .



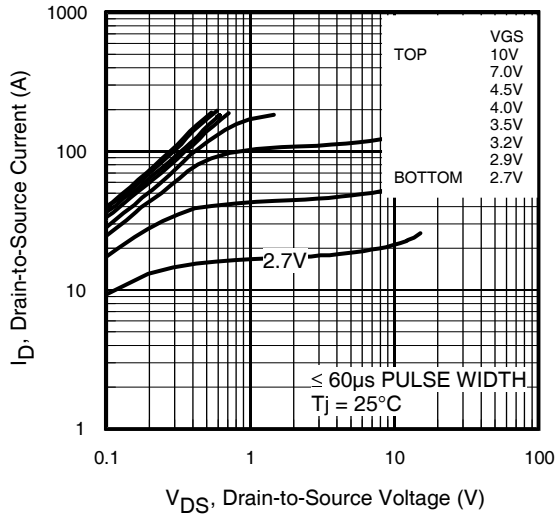


Fig 1. Typical Output Characteristics

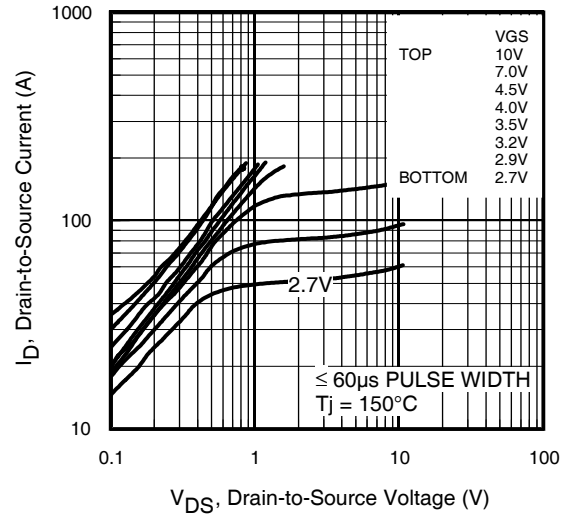


Fig 2. Typical Output Characteristics

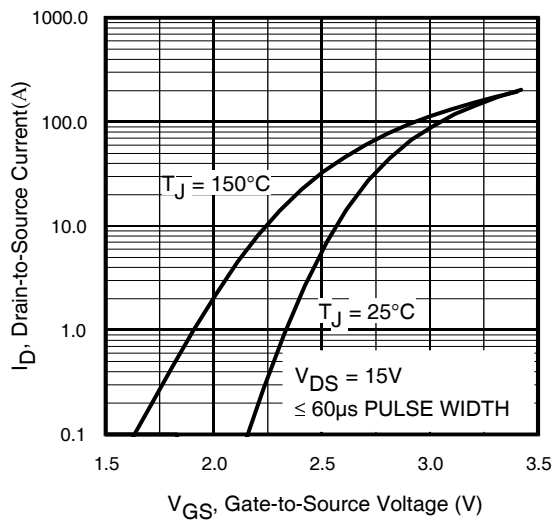


Fig 3. Typical Transfer Characteristics

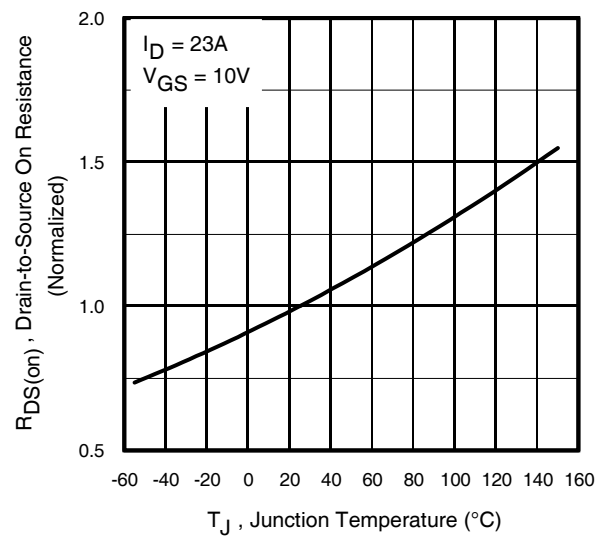


Fig 4. Normalized On-Resistance vs. Temperature

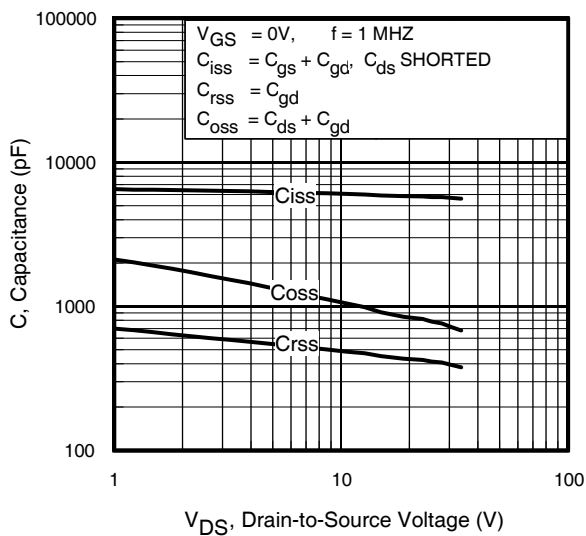


Fig 5. Typical Capacitance vs. Drain-to-Source Voltage
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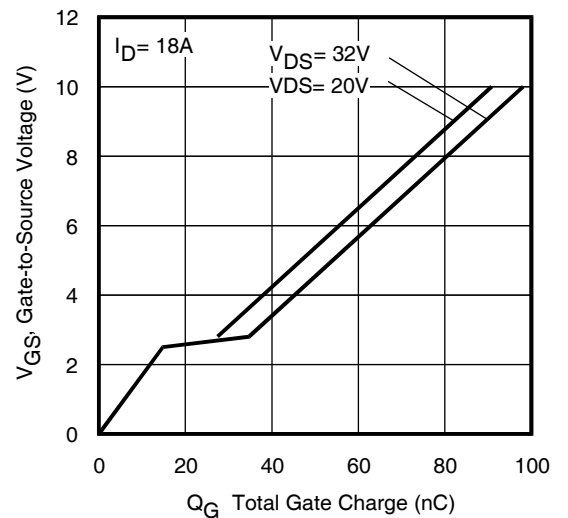


Fig 6. Typical Gate Charge vs. Gate-to-Source Voltage

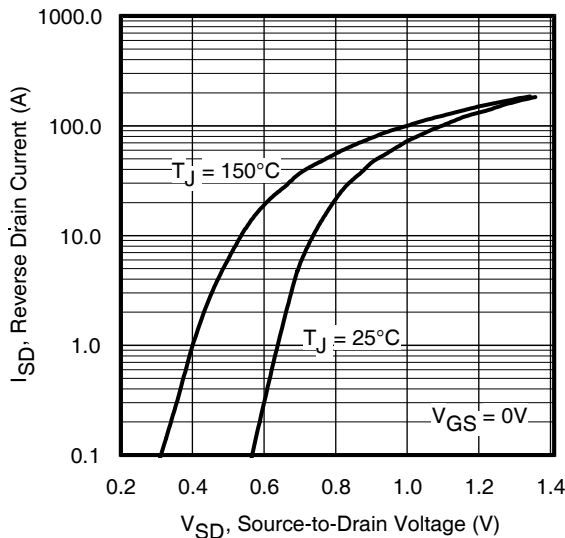


Fig 7. Typical Source-Drain Diode Forward Voltage

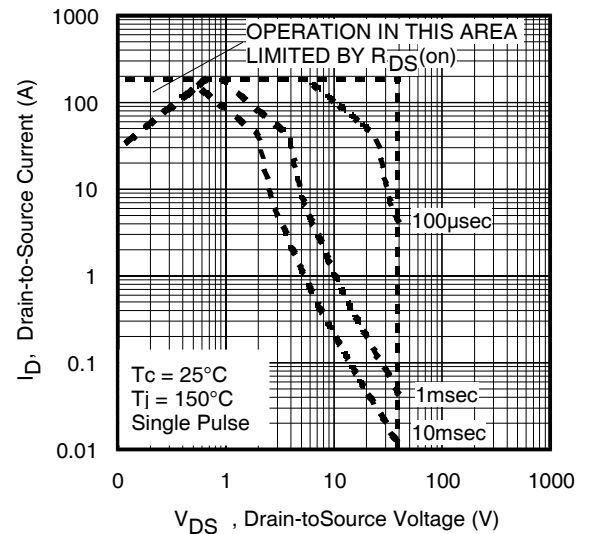


Fig 8. Maximum Safe Operating Area

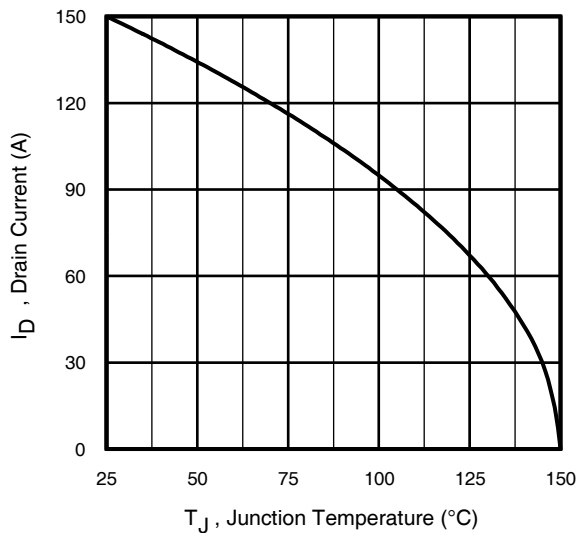


Fig 9. Maximum Drain Current vs. Case Temperature

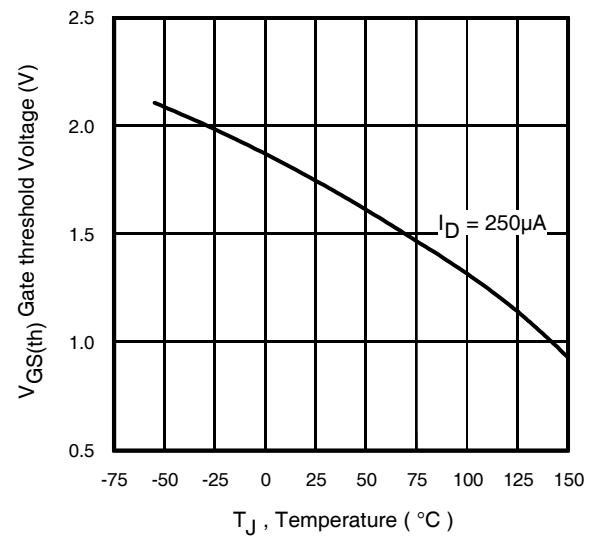


Fig 10. Threshold Voltage vs. Temperature

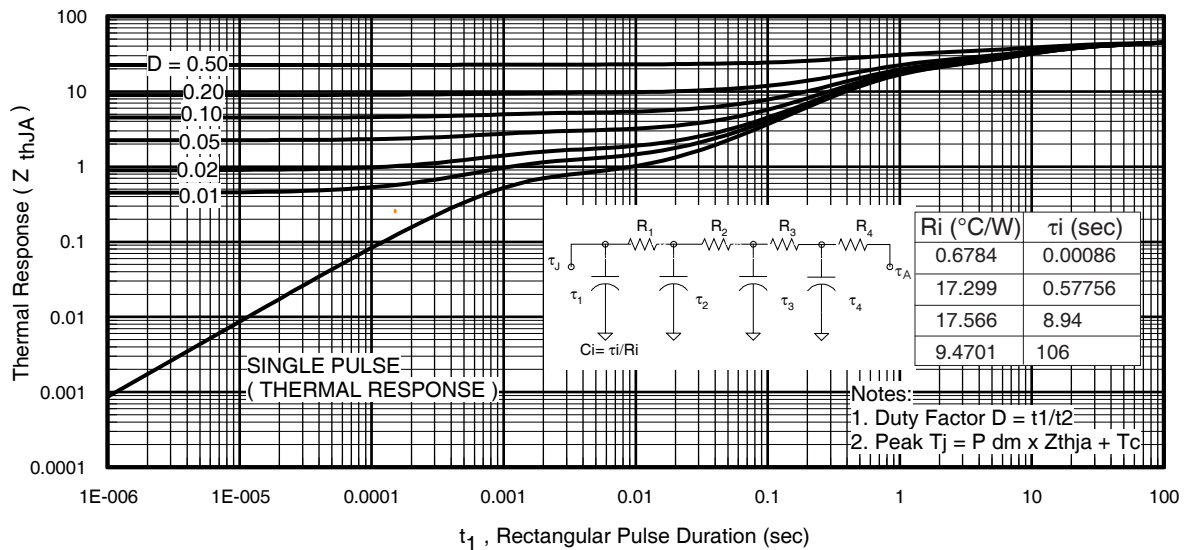


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

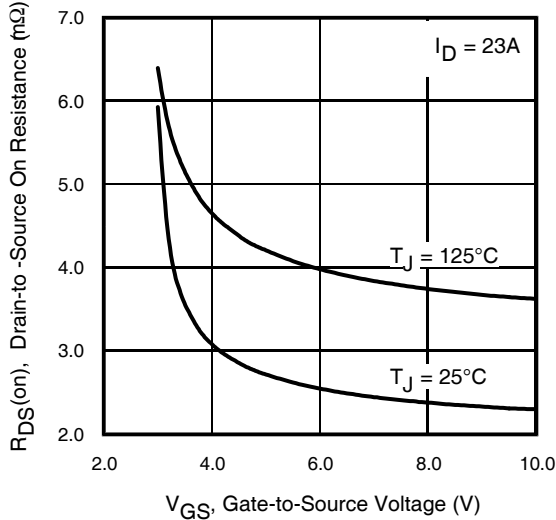


Fig 12. On-Resistance Vs. Gate Voltage

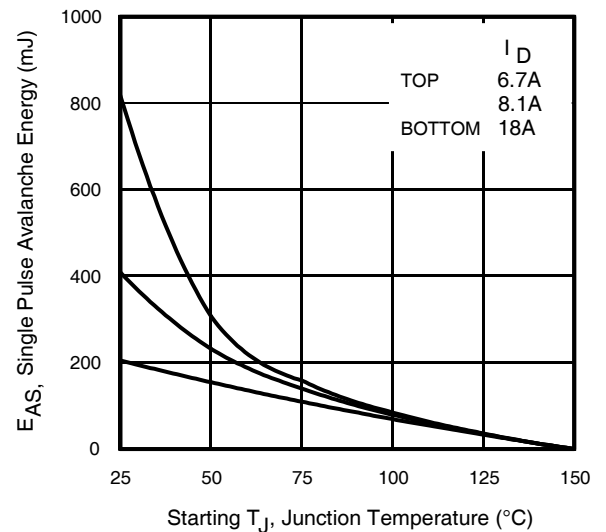


Fig 13c. Maximum Avalanche Energy Vs. Drain Current

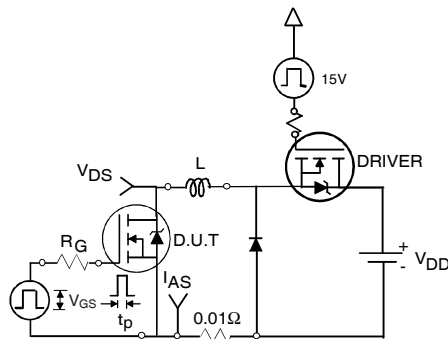


Fig 13a. Unclamped Inductive Test Circuit

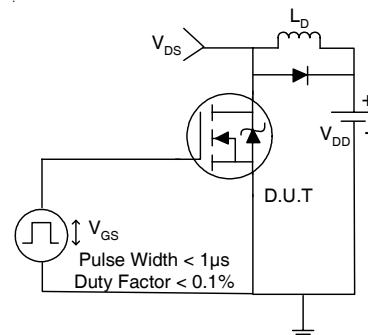


Fig 14a. Switching Time Test Circuit

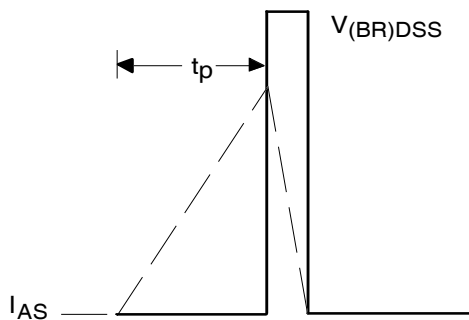


Fig 13b. Unclamped Inductive Waveforms

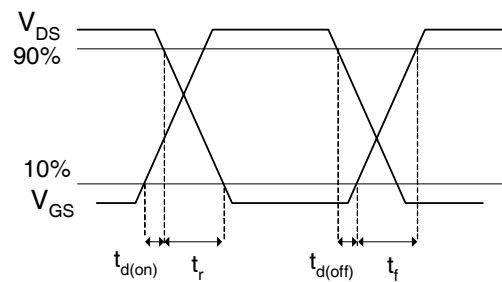


Fig 14b. Switching Time Waveforms

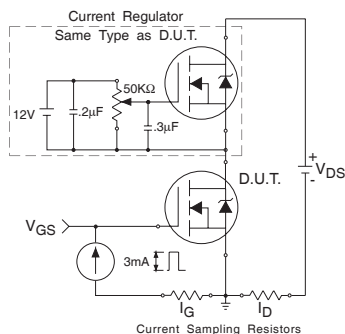


Fig 15. Gate Charge Test Circuit

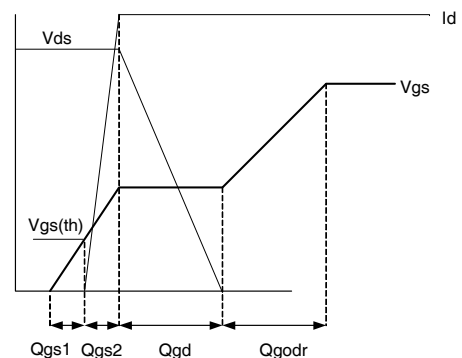


Fig 16. Gate Charge Waveform

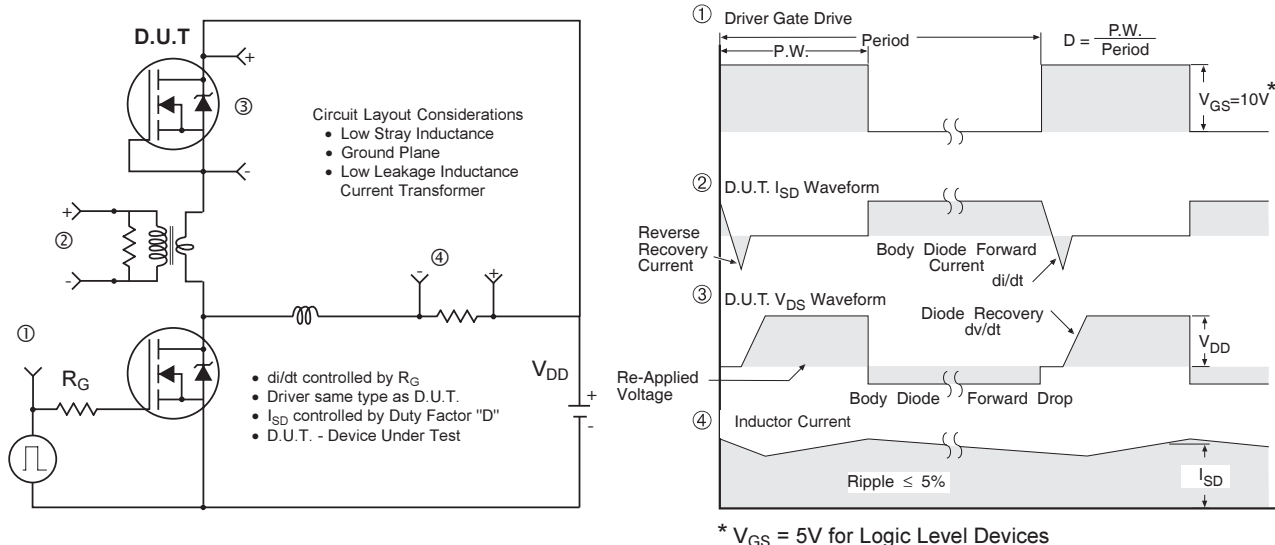
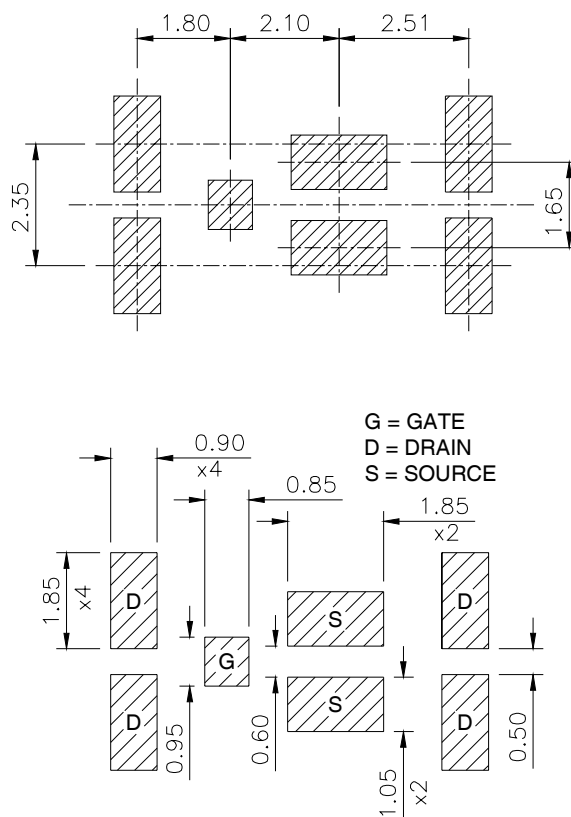


Fig 17. Diode Reverse Recovery Test Circuit for N-Channel HEXFET® Power MOSFETs

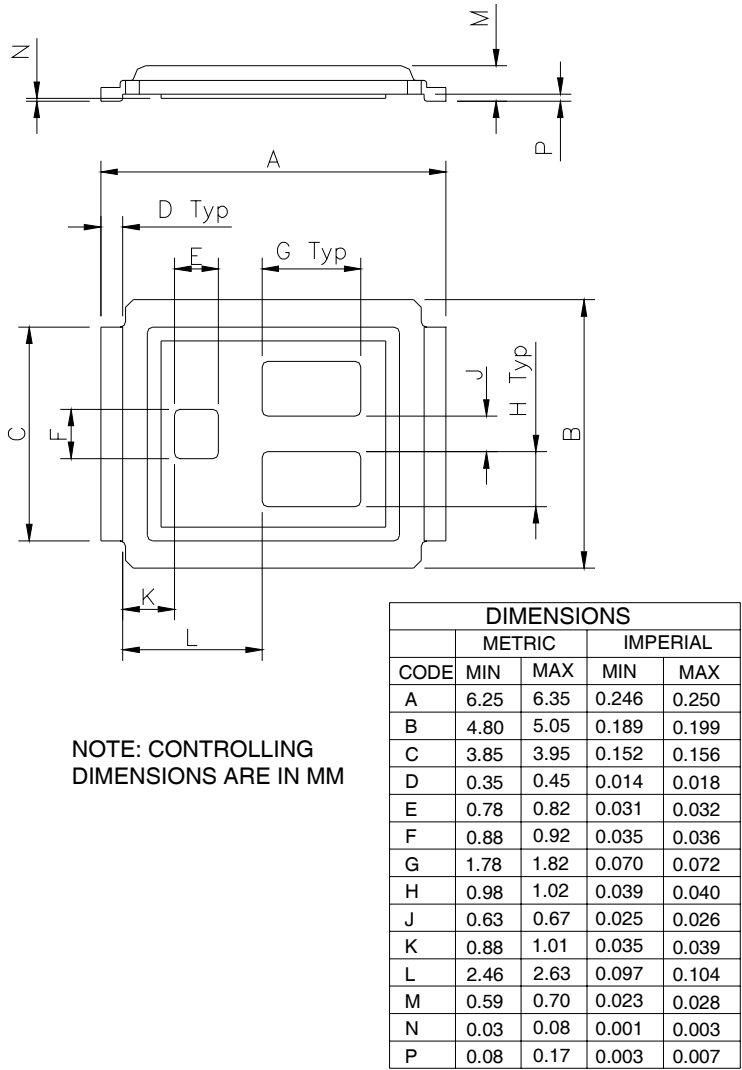
DirectFET™ Substrate and PCB Layout, MT Outline (Medium Size Can, T-Designation).

Please see DirectFET application note AN-1035 for all details regarding the assembly of DirectFET. This includes all recommendations for stencil and substrate designs.

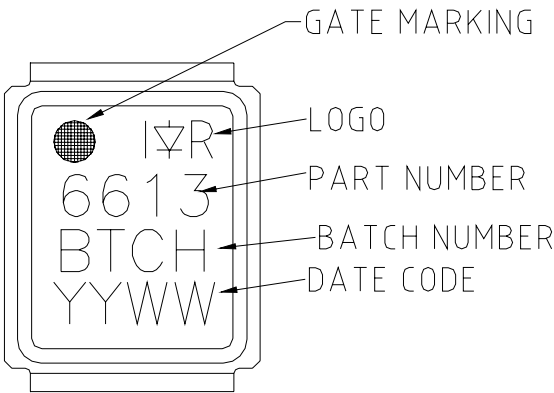


DirectFET™ Outline Dimension, MT Outline
(Medium Size Can, T-Designation).

Please see DirectFET application note AN-1035 for all details regarding the assembly of DirectFET. This includes all recommendations for stencil and substrate designs.



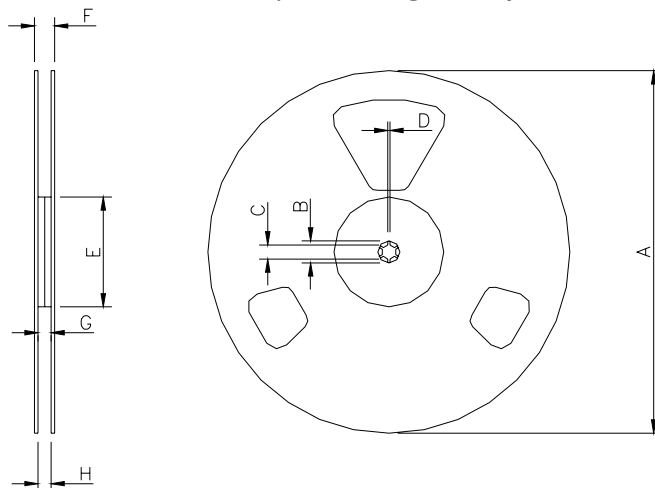
DirectFET™ Part Marking



IRF6613

International
IR Rectifier

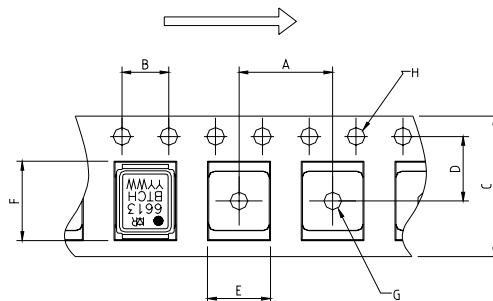
DirectFET™ Tape & Reel Dimension (Showing component orientation).



NOTE: Controlling dimensions in mm
Std reel quantity is 4800 parts. (ordered as IRF6613). For 1000 parts on 7" reel,
order IRF6613TR1

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					
CODE	METRIC		IMPERIAL		
	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/>