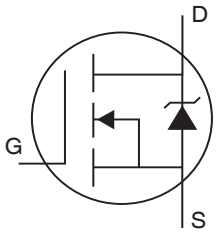
- V_{DS}(V) = 100V
- I_D = 10A (V_{GS}= 10V)
- $R_{DS(ON)}$ < 185mΩ (V_{GS} = 10V)
- $R_{DS(ON)}$ < 225mΩ (V_{GS} = 5V)
- $R_{DS(ON)}$ < 265mΩ (V_{GS} = 4V)



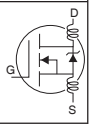
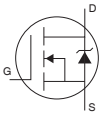
Absolute Maximum Ratings

	Parameter	Max.	Units
I_D @ T_C = 25°C	Continuous Drain Current, V_{GS} @ 10V	10	A
I_D @ T_C = 100°C	Continuous Drain Current, V_{GS} @ 10V	7.0	
I_{DM}	Pulsed Drain Current ①⑥	35	
P_D @T_C = 25°C	Power Dissipation	48	W
	Linear Derating Factor	0.32	W/°C
V_{GS}	Gate-to-Source Voltage	± 16	V
E_{AS}	Single Pulse Avalanche Energy②⑥	85	mJ
I_{AR}	Avalanche Current①⑥	6.0	A
E_{AR}	Repetitive Avalanche Energy①⑥	4.8	mJ
dv/dt	Peak Diode Recovery dv/dt ③	5.0	V/ns
T_J T_{STG}	Operating Junction and Storage Temperature Range	-55 to + 175	°C
	Soldering Temperature, for 10 seconds	300 (1.6mm from case)	

Thermal Resistance

	Parameter	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-Case		3.1	°C/W
$R_{\theta JA}$	Junction-to-Ambient (PCB mount) **		50	
$R_{\theta JA}$	Junction-to-Ambient		110	

Electrical Characteristics @ T_J = 25°C (unless otherwise specified)

	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	100			V	V_{GS} = 0V, I_D = 250μA
$\Delta V_{(BR)DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient		0.12		V/°C	Reference to 25°C, I_D = 1mA
$R_{DS(on)}$	Static Drain-to-Source On-Resistance			185	mΩ	V_{GS} = 10V, I_D = 6.0A ④
				225		V_{GS} = 5.0V, I_D = 6.0A ④
				265		V_{GS} = 4.0V, I_D = 5.0A ④
$V_{GS(th)}$	Gate Threshold Voltage	1.0		2.0	V	V_{DS} = V_{GS}, I_D = 250μA
g_{fs}	Forward Transconductance	3.1			S	V_{DS} = 25V, I_D = 6.0A⑥
I_{DSS}	Drain-to-Source Leakage Current			25	μA	V_{DS} = 100V, V_{GS} = 0V
				250		V_{DS} = 80V, V_{GS} = 0V, T_J = 150°C
I_{GSS}	Gate-to-Source Forward Leakage			100	nA	V_{GS} = 16V
	Gate-to-Source Reverse Leakage			-100		V_{GS} = -16V
Q_g	Total Gate Charge			20	nC	I_D = 6.0A
Q_{gs}	Gate-to-Source Charge			4.6		V_{DS} = 80V
Q_{gd}	Gate-to-Drain ("Miller") Charge			10		V_{GS} = 5.0V, See Fig. 6 and 13 ④⑥
$t_{d(on)}$	Turn-On Delay Time		4.0		ns	V_{DD} = 50V
t_r	Rise Time		35			I_D = 6.0A
$t_{d(off)}$	Turn-Off Delay Time		23			R_G = 11Ω, V_{GS} = 5.0V
t_f	Fall Time		22			R_D = 8.2Ω, See Fig. 10 ④⑥
L_D	Internal Drain Inductance		4.5		nH	Between lead, 6mm (0.25in.) from package and center of die contact⑤ 
L_S	Internal Source Inductance		7.5			
C_{iss}	Input Capacitance		440		pF	V_{GS} = 0V
C_{oss}	Output Capacitance		97			V_{DS} = 25V
C_{rss}	Reverse Transfer Capacitance		50			f = 1.0MHz, See Fig. 5 ⑥
	Parameter	**Min.**	**Typ.**	**Max.**	**Units**	**Conditions**
I_S	Continuous Source Current (Body Diode)			10	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I_{SM}	Pulsed Source Current (Body Diode) ①⑥			35		
V_{SD}	Diode Forward Voltage			1.3	V	T_J = 25°C, I_S = 6.0A, V_{GS} = 0V ④
t_{rr}	Reverse Recovery Time		110	160	ns	T_J = 25°C, I_F =6.0A
Q_{rr}	Reverse RecoveryCharge		410	620	nC	di/dt = 100A/μs ④⑥
t_{on}	Forward Turn-On Time	Intrinsic turn-on time is negligible (turn-on is dominated by L_S+L_D)				

Notes:

① Repetitive rating; pulse width limited by max. junction temperature. (See fig. 11)

② V_{DD} = 25V, starting T_J = 25°C, L = 4.7mH R_G = 25Ω, I_{AS} = 6.0A. (See Figure 12)

③ I_{SD} ≤ 6.0A, di/dt ≤ 340A/μs, V_{DD} ≤ $V_{(BR)DSS}$, T_J ≤ 175°C

④ Pulse width ≤ 300μs; duty cycle ≤ 2%.

⑤ This is applied for I-PAK, L_S of D-PAK is measured between lead and center of die contact

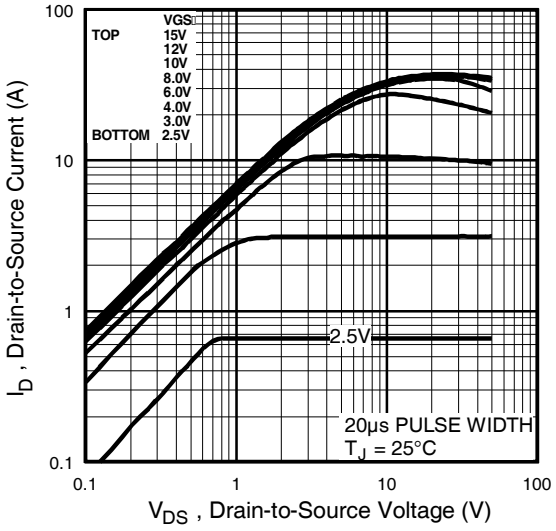


Fig 1. Typical Output Characteristics

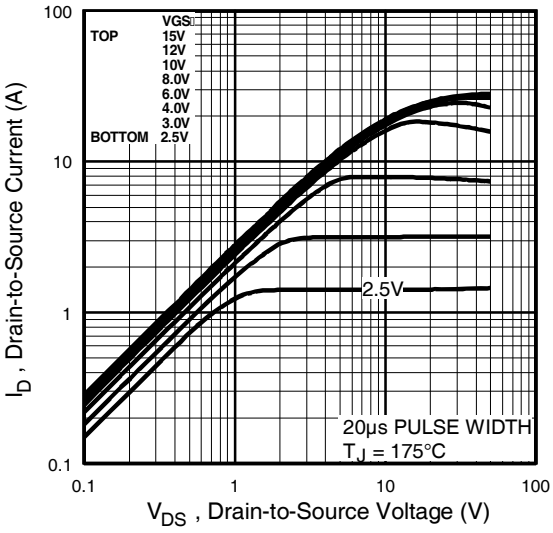


Fig 2. Typical Output Characteristics

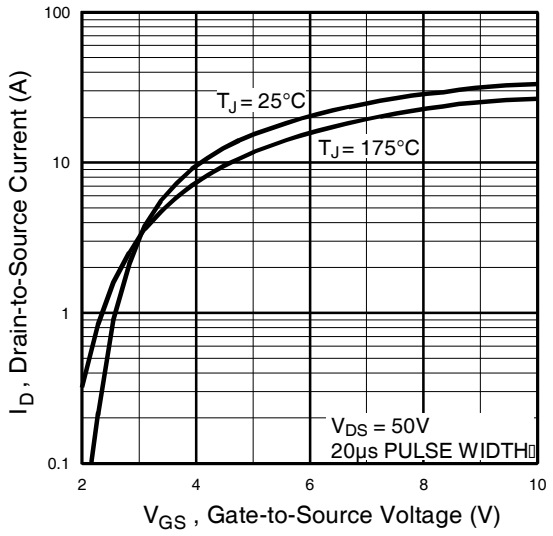


Fig 3. Typical Transfer Characteristics

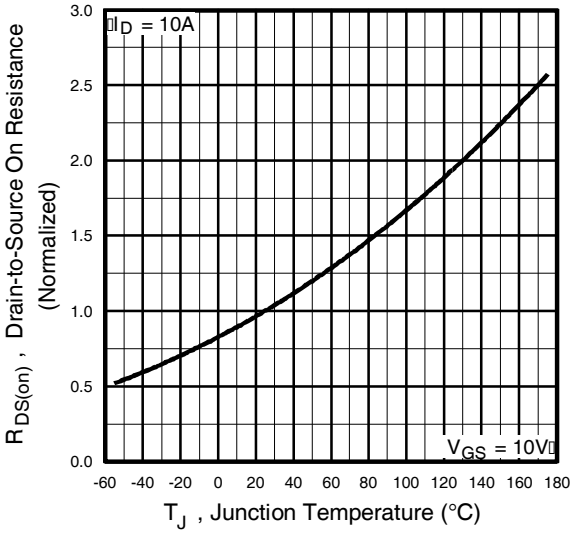


Fig 4. Normalized On-Resistance Vs. Temperature

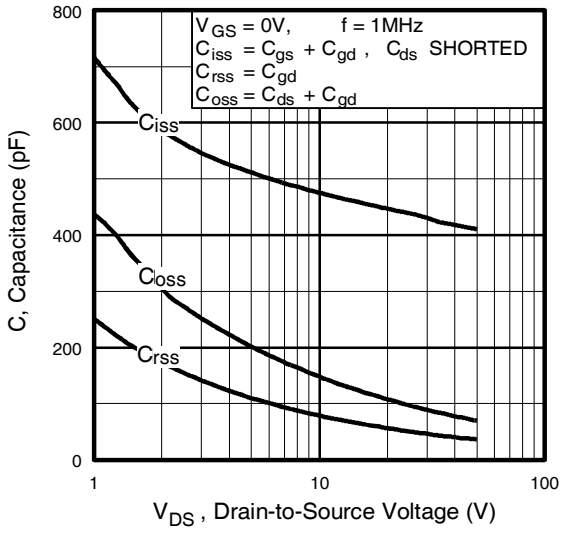


Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

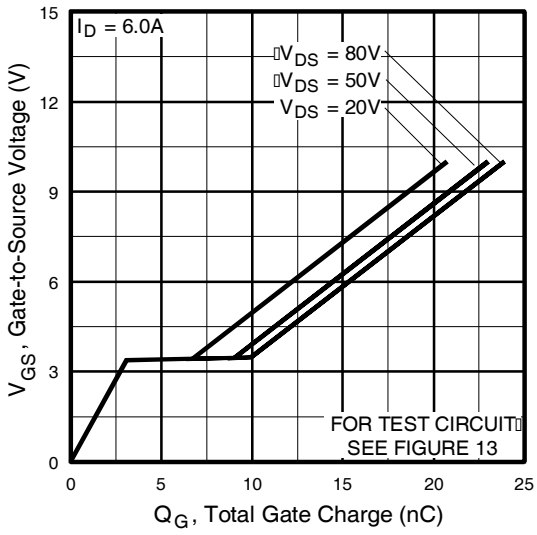


Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage

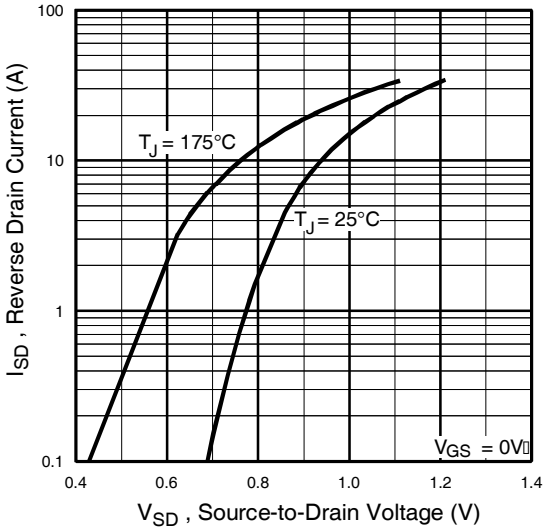


Fig 7. Typical Source-Drain Diode Forward Voltage

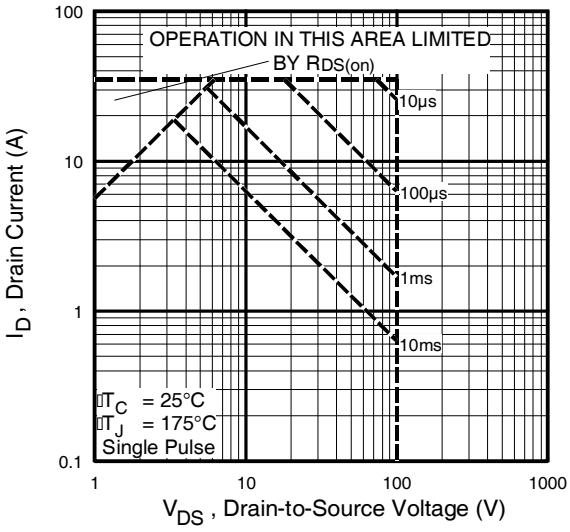


Fig 8. Maximum Safe Operating Area

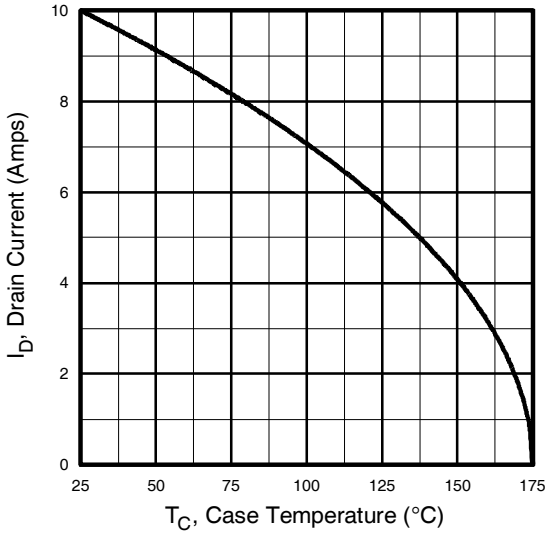


Fig 9. Maximum Drain Current Vs. Case Temperature

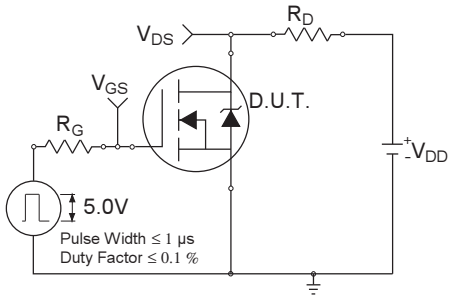


Fig 10a. Switching Time Test Circuit

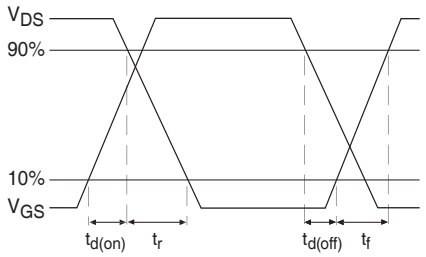


Fig 10b. Switching Time Waveforms

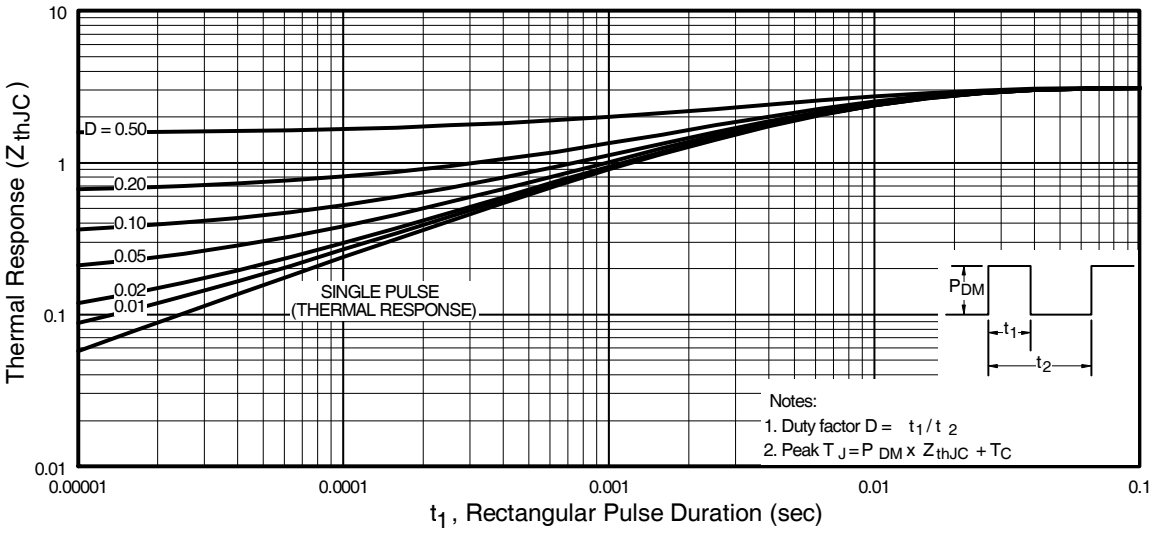


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Case

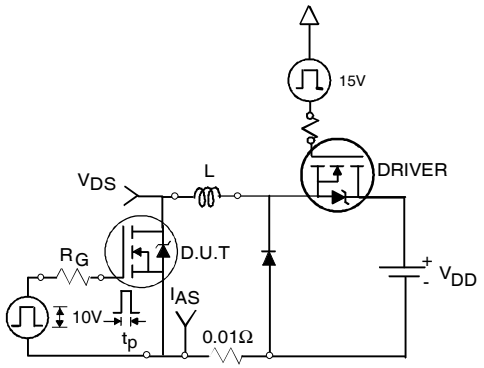


Fig 12a. Unclamped Inductive Test Circuit

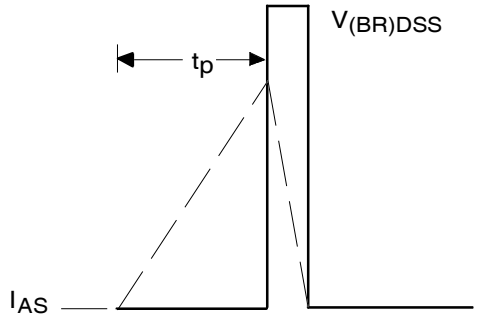


Fig 12b. Unclamped Inductive Waveforms

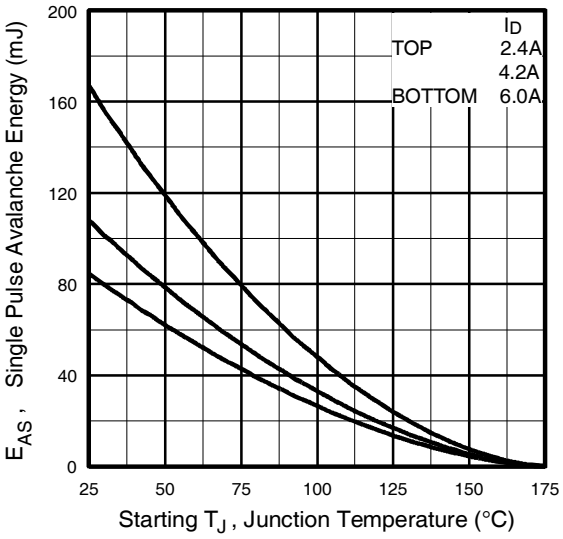


Fig 12c. Maximum Avalanche Energy Vs. Drain Current

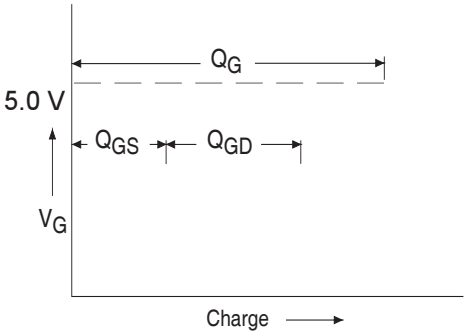


Fig 13a. Basic Gate Charge Waveform

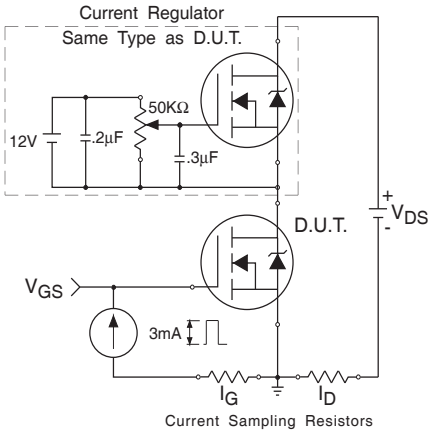
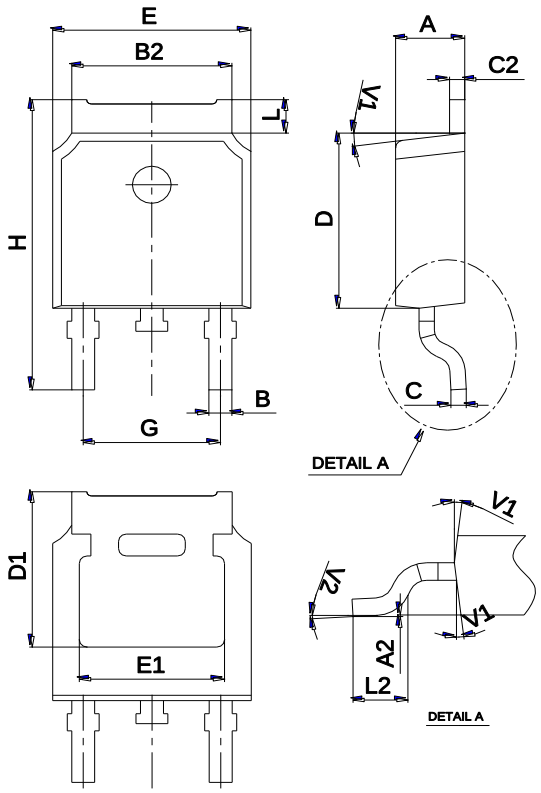


Fig 13b. Gate Charge Test Circuit

Package Mechanical Data TO-252



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.10		2.50	0.083		0.098
A2	0		0.10	0		0.004
B	0.66		0.86	0.026		0.034
B2	5.18		5.48	0.202		0.216
C	0.40		0.60	0.016		0.024
C2	0.44		0.58	0.017		0.023
D	5.90		6.30	0.232		0.248
D1	5.30REF			0.209REF		
E	6.40		6.80	0.252		0.268
E1	4.63			0.182		
G	4.47		4.67	0.176		0.184
H	9.50		10.70	0.374		0.421
L	1.09		1.21	0.043		0.048
L2	1.35		1.65	0.053		0.065
V1		7°			7°	
V2	0°		6°	0°		6°

Marking

Ordering information

Order code	Package	Baseqty	Deliverymode
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