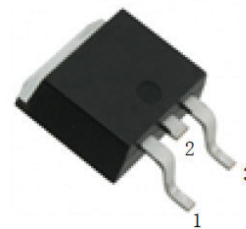
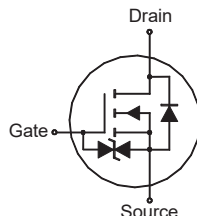


Features

- Surface-mounted package
- Halogen and Antimony Free(HAF), RoHS compliant
- Built-in G-S Protection Diode
- Typical ESD Protection HBM Class 2



1.Gate 2.Drain 3.Source
TO-252 Plastic Package

Classification	Voltage Range(V)
0A	< 125
0B	125 to < 250
1A	250 to < 500
1B	500 to < 1000
1C	1000 to < 2000
2	2000 to < 4000
3A	4000 to < 8000
3B	≥ 8000

Key Parameters

Parameter	Value	Unit
BV_{DSS}	1000	V
$R_{DS(ON) \text{ Max}}$	6.8 @ $V_{GS} = 10 \text{ V}$	Ω
$V_{GS(th) \text{ typ}}$	3.7	V
$Q_g \text{ typ}$	22 @ $V_{GS} = 10 \text{ V}$	nC

Applications

- Switch Mode Power Supply
- Power Factor Correction

Absolute Maximum Ratings (at $T_a = 25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	1000	V
Gate-Source Voltage	V_{GS}	± 25	V
Continuous Drain Current $T_c = 25^\circ\text{C}$ $T_c = 100^\circ\text{C}$	I_D	2 1.2	A
Peak Drain Current, Pulsed ¹⁾	I_{DM}	4	A
Avalanche Current	I_{AS}	3.5	A
Single Pulse Avalanche Energy ²⁾	E_{AS}	61.2	mJ
Total Power Dissipation $T_c = 25^\circ\text{C}$	P_{tot}	54.3	W
Operating Junction and Storage Temperature Range	T_J, T_{stg}	- 55 to + 150	$^\circ\text{C}$

Thermal Characteristics

Parameter	Symbol	Max.	Unit
Thermal Resistance from Junction to Case	$R_{\theta JC}$	2.3	$^\circ\text{C/W}$
Thermal Resistance from Junction to Ambient ³⁾	$R_{\theta JA}$	40	$^\circ\text{C/W}$

¹⁾ Pulse Test: Pulse Width $\leq 100 \mu\text{s}$, Duty Cycle $\leq 2\%$, Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)} = 150^\circ\text{C}$.

²⁾ Limited by $T_{J(MAX)}$, starting $T_J = 25^\circ\text{C}$, $L = 10 \text{ mH}$, $R_g = 25 \Omega$, $I_{AS} = 3.5 \text{ A}$, $V_{GS} = 10 \text{ V}$.

³⁾ Device mounted on FR-4 substrate PC board, 2oz copper, with 1-inch square copper plate in still air.

Characteristics at T_a = 25°C unless otherwise specified

Parameter	Symbol	Min.	Typ.	Max.	Unit
STATIC PARAMETERS					
Drain-Source Breakdown Voltage at I _D = 250 μ A	BV _{DSS}	1000	-	-	V
Drain-Source Leakage Current at V _{DS} = 1000 V	I _{DSS}	-	-	1	μ A
Gate Leakage Current at V _{GS} = $\pm$ 20 V	I _{GSS}	-	-	$\pm$ 10	μ A
Gate-Source Threshold Voltage at V _{DS} = V _{GS} , I _D = 250 μ A	V _{GS(th)}	3	-	4	V
Drain-Source On-State Resistance at V _{GS} = 10 V, I _D = 1.5 A	R _{DS(on)}	-	5.3	6.8	Ω
DYNAMIC PARAMETERS					
Forward Transconductance at V _{DS} = 20 V, I _D = 1 A	g _{FS}	-	3	-	S
Gate Resistance at V _{GS} = 0 V, V _{DS} = 0 V, f = 1 MHz	R _g	-	7.7	-	Ω
Input Capacitance at V _{GS} = 0 V, V _{DS} = 500 V, f = 1 MHz	C _{iss}	-	552	-	pF
Output Capacitance at V _{GS} = 0 V, V _{DS} = 500 V, f = 1 MHz	C _{oss}	-	29	-	pF
Reverse Transfer Capacitance at V _{GS} = 0 V, V _{DS} = 500 V, f = 1 MHz	C _{rss}	-	9	-	pF
Total Gate Charge at V _{DS} = 500 V, V _{GS} = 10 V, I _D = 1.5 A	Q _g	-	22	-	nC
Gate Source Charge at V _{DS} = 500 V, V _{GS} = 10 V, I _D = 1.5 A	Q _{gs}	-	3.4	-	nC
Gate Drain Charge at V _{DS} = 500 V, V _{GS} = 10 V, I _D = 1.5 A	Q _{gd}	-	11	-	nC
Turn-On Delay Time at V _{DS} = 500 V, V _{GS} = 10 V, I _D = 1.5 A, R _g = 24 Ω	t _{d(on)}	-	32	-	ns
Turn-On Rise Time at V _{DS} = 500 V, V _{GS} = 10 V, I _D = 1.5 A, R _g = 24 Ω	t _r	-	23.6	-	ns
Turn-Off Delay Time at V _{DS} = 500 V, V _{GS} = 10 V, I _D = 1.5 A, R _g = 24 Ω	t _{d(off)}	-	36	-	ns
Turn-Off Fall Time at V _{DS} = 500 V, V _{GS} = 10 V, I _D = 1.5 A, R _g = 24 Ω	t _f	-	117	-	ns
Body-Diode PARAMETERS					
Drain-Source Diode Forward Voltage at I _S = 1.5 A, V _{GS} = 0 V	V _{SD}	-	-	1.4	V
Body-Diode Continuous Current	I _S	-	-	2	A
Body-Diode Continuous Current, Pulsed	I _{SM}	-	-	4	A
Body Diode Reverse Recovery Time at I _S = 1.5 A, di/dt = 100 A / μ s	t _{rr}	-	357	-	ns
Body Diode Reverse Recovery Charge at I _S = 1.5 A, di/dt = 100 A / μ s	Q _{rr}	-	1.5	-	μ C

Electrical Characteristics Curves

Fig. 1 Typical Output Characteristics

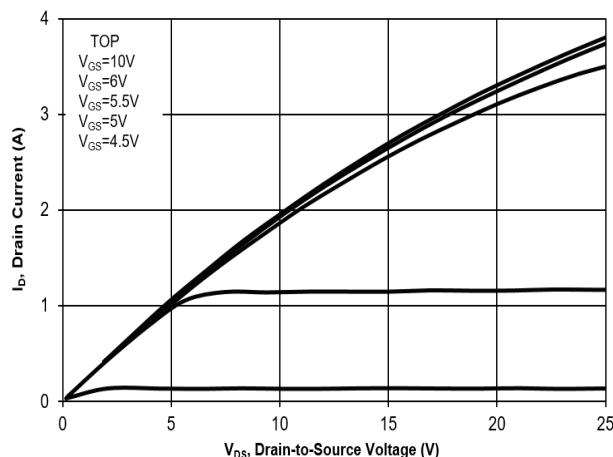


Fig. 2 Typical Transfer Characteristics

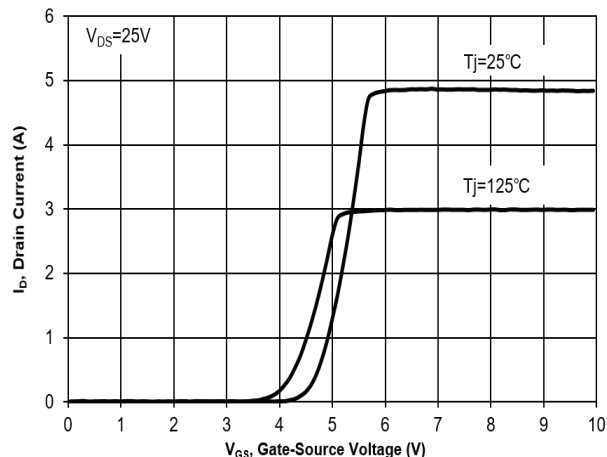


Fig. 3 On-Resistance vs. Drain Current

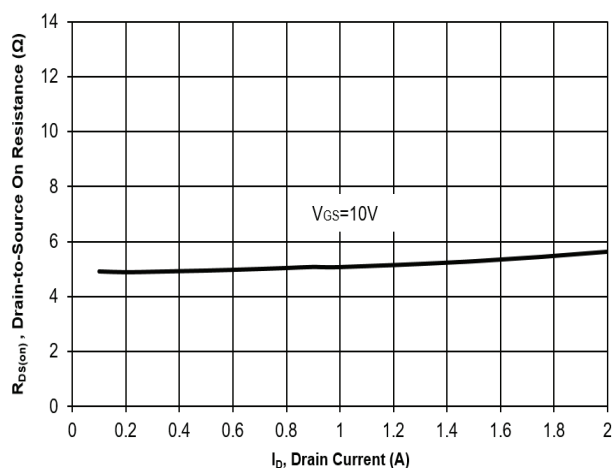


Fig. 4 On-Resistance vs. Gate to Source Voltage

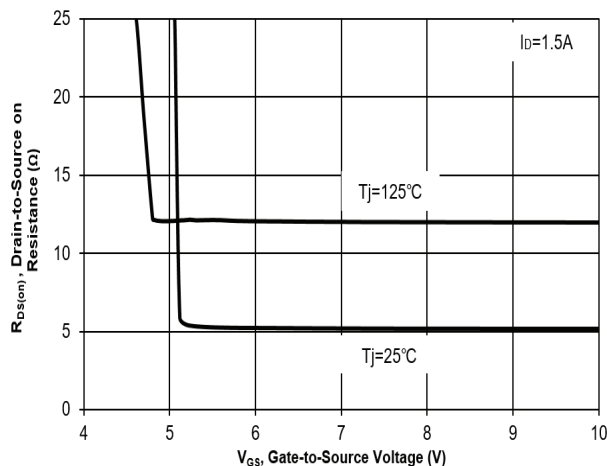


Fig. 5 On-Resistance vs. T_j

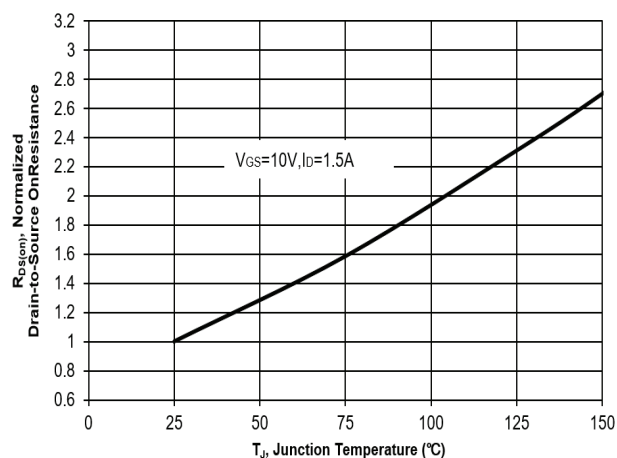


Fig. 6 Typical Body-Diode Forward Characteristics

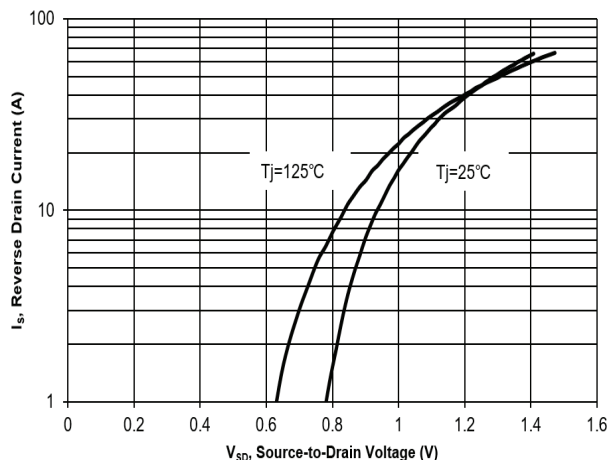


Fig. 7 Typical Junction Capacitance

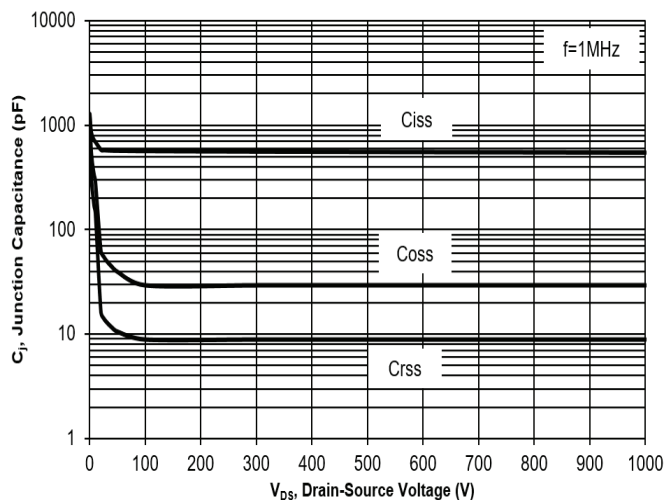


Fig. 8 Drain-Source Leakage Current vs. T_j

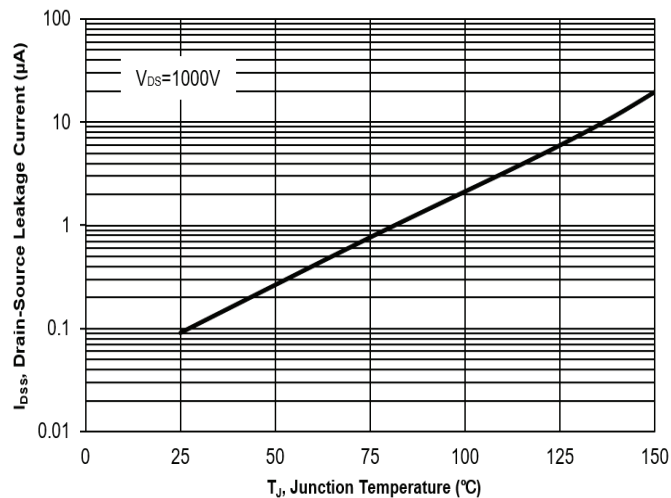


Fig. 9 $V_{(BR)DSS}$ vs. Junction Temperature

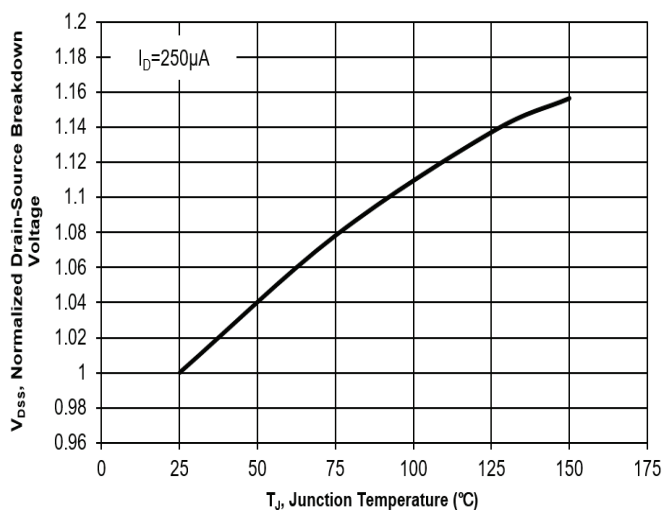


Fig. 10 Gate Threshold Variation vs. T_j

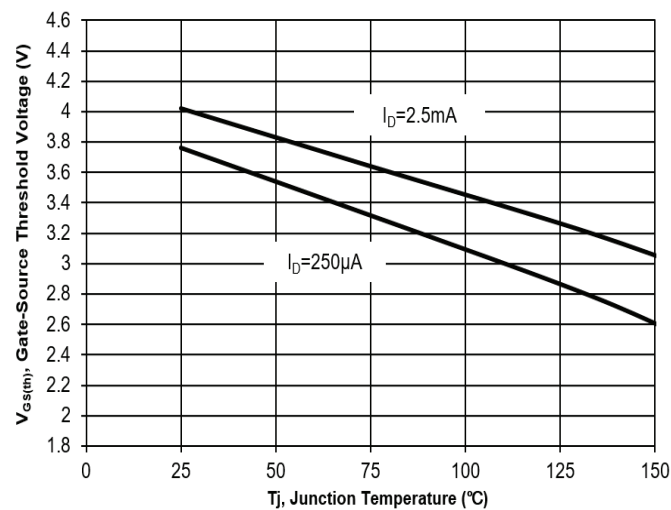


Fig. 11 Gate Charge

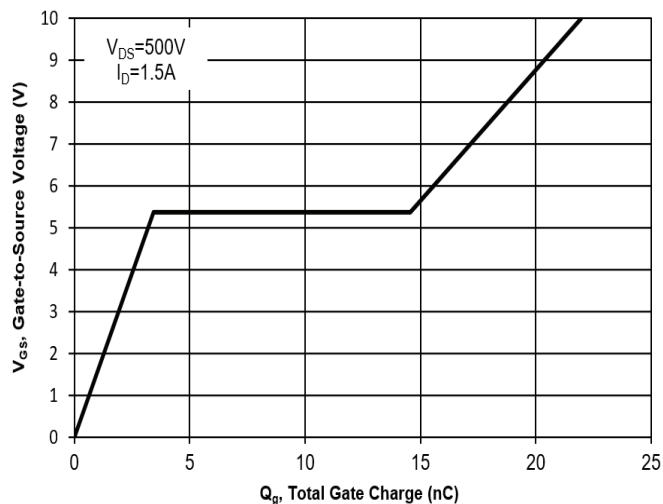
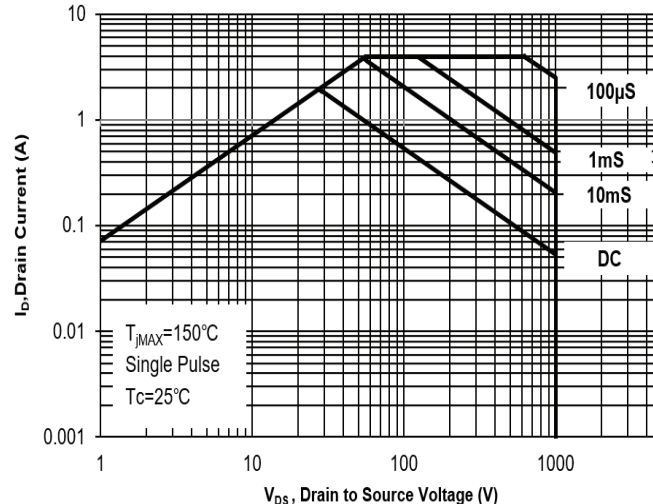
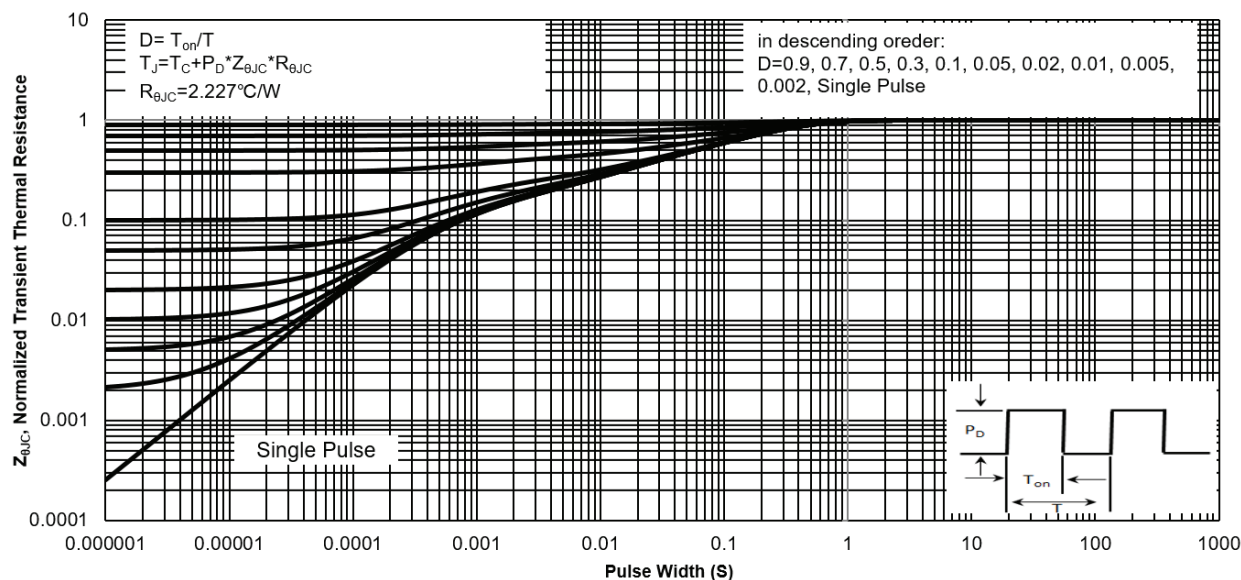
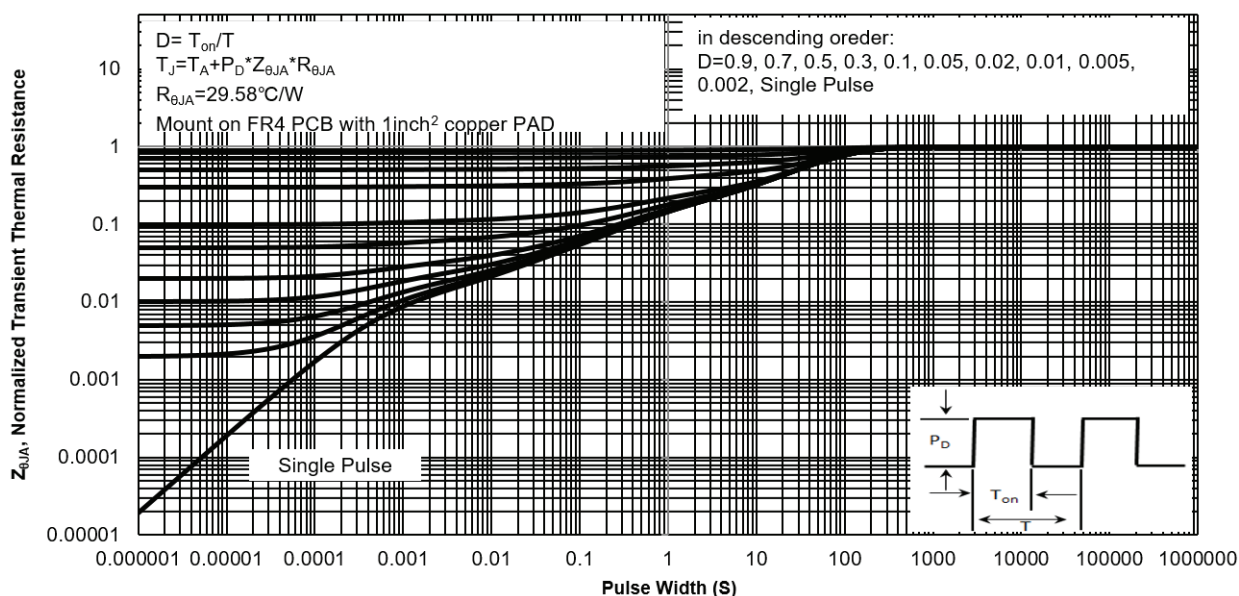


Fig. 12 Safe Operation Area



Electrical Characteristics Curves
Fig. 13 Normalized Maximum Transient Thermal Impedance($z_{\theta JC}$)

Fig. 14 Normalized Maximum Transient Thermal Impedance($z_{\theta JA}$)


Test Circuits

Fig.1-1 Switching times test circuit

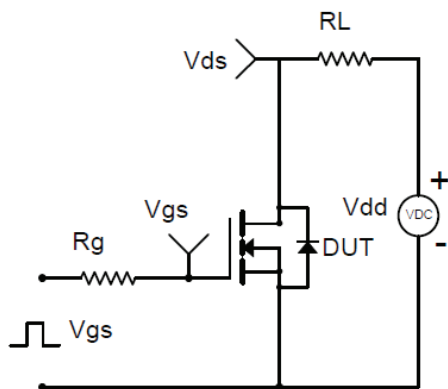


Fig.1-2 Switching Waveform

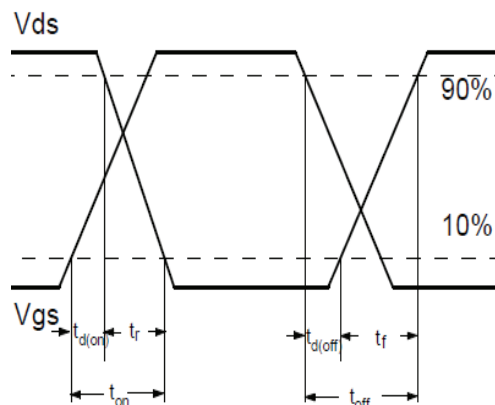


Fig.2-1 Gate charge test circuit

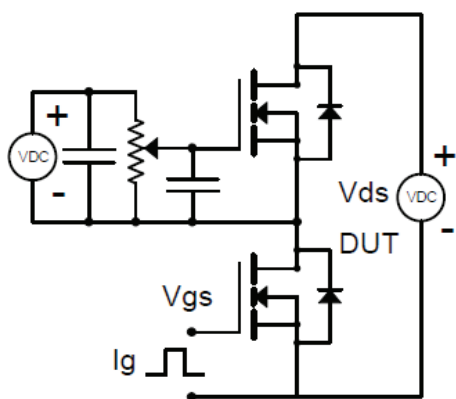


Fig.2-2 Gate charge waveform

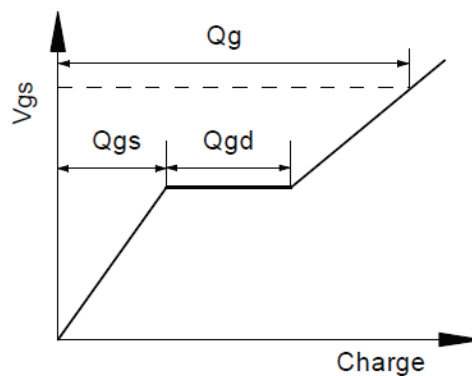


Fig.3-1 Avalanche test circuit

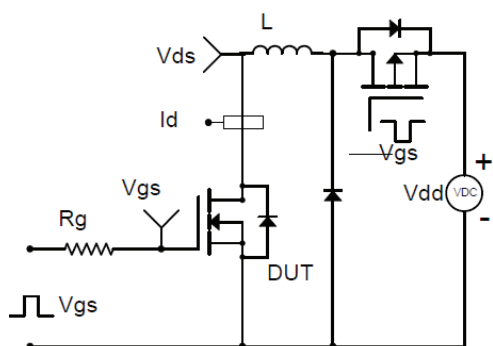
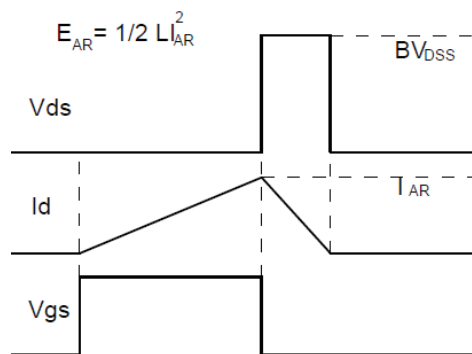
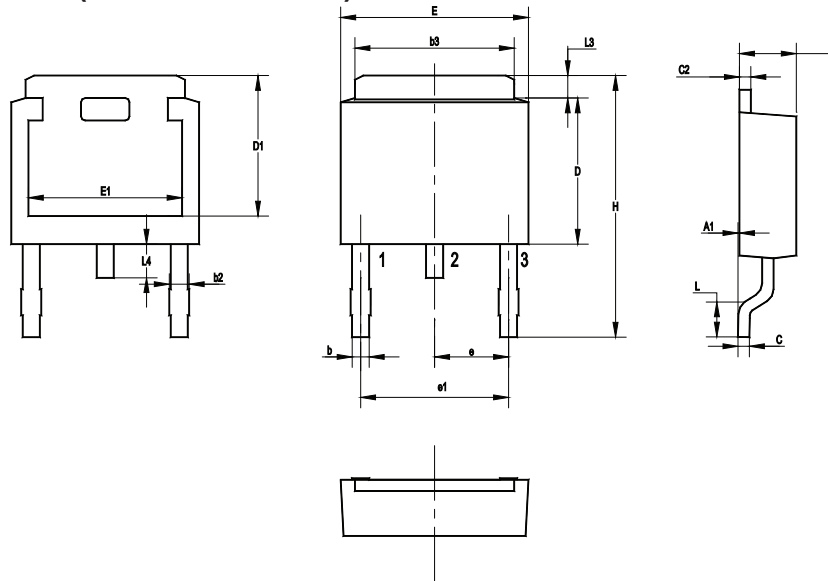


Fig.3-2 Avalanche waveform



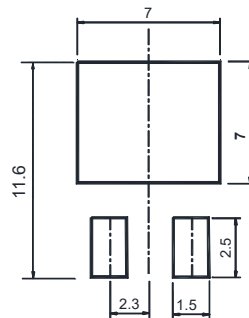
Package Outline (Dimensions in mm)

TO-252



UNIT	A	A1	b	b2	b3	C	C2	D	D1	E	E1	e	e1	H	L	L3	L4
mm	2.5	0.15	1.0	1.15	5.5	0.65	0.65	6.2	5.4	6.7	5.0	2.30	4.60	10.7	1.78	1.20	1.10
	2.1	0	0.5	0.65	4.9	0.4	0.4	5.6	5.0	6.1	4.6	TYP.	TYP.	9	1.40	0.85	0.51

Recommended Soldering Footprint



Packing information

Package	Tape Width (mm)	Pitch		Reel Size		Per Reel Packing Quantity
		mm	inch	mm	inch	
TO-252	16	8 ± 0.1	0.315 ± 0.004	330	13	2,500

Marking information

" LR100N6K8K " = Part No.

" ***** " = Date Code Marking

Font type: Arial



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