

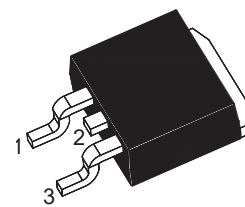
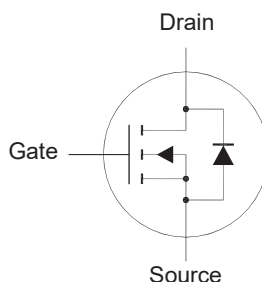
N-Channel Enhancement Mode MOSFET

Features

- Advanced trench cell design
- High speed switch
- Halogen and Antimony Free(HAF), RoHS compliant

Applications

- Portable appliances
- Power management



1.Gate 2.Drain 3.Source
TO-263 Plastic Package

Key Parameters

Parameter	Value	Unit
BV_{DS}	60	V
$R_{DS(ON)} \text{ Max}$	3.2 @ $V_{GS} = 10 \text{ V}$	m Ω
$V_{GS(th)} \text{ typ}$	3	V
$Q_g \text{ typ}$	75 @ $V_{GS} = 10 \text{ V}$	nC

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

Parameter	Symbol	Value	Unit
Drain Source Voltage	V_{DS}	60	V
Gate Source Voltage	V_{GS}	± 20	V
Drain Current - Continuous	I_D	120	A
$T_c = 25^\circ\text{C}$		77	
$T_c = 100^\circ\text{C}$			
Drain Current - Pulsed ¹⁾	I_{DM}	480	A
Avalanche Current, Single Pulse	I_{AS}	44.8	A
Avalanche Energy, Single Pulse ²⁾	E_{AS}	100.3	mJ
Power Dissipation	P_D	62.5	W
$T_c = 25^\circ\text{C}$			
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	$^\circ\text{C/W}$
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 $T_j = 25^\circ\text{C}$, $L = 0.1 \text{ mH}$, $R_g = 25 \Omega$, $I_{AS} = 44.8 \text{ A}$, $V_{GS} = 10 \text{ V}$.

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

Characteristics at $T_a = 25^\circ\text{C}$ unless otherwise specified

Parameter	Symbol	Min.	Typ.	Max.	Unit
STATIC PARAMETERS					
Drain-Source Breakdown Voltage at $I_D = 1\text{ mA}$	BV_{DSS}	60	-	-	V
Drain-Source Leakage Current at $V_{DS} = 60\text{ V}$	I_{DSS}	-	-	1	μA
Gate-Source Leakage Current at $V_{GS} = \pm 20\text{ V}$	I_{GSS}	-	-	± 100	nA
Gate-Source Threshold Voltage at $V_{DS} = V_{GS}$, $I_D = 120\text{ }\mu\text{A}$	V_{GSth}	2	-	4	V
Drain-Source On-State Resistance at $V_{GS} = 10\text{ V}$, $I_D = 100\text{ A}$	$R_{DS(on)}$	-	2.8	3.2	m Ω
DYNAMIC PARAMETERS					
Gate resistance at $V_{GS} = 0\text{ V}$, $V_{DS} = 0\text{ V}$, $f = 1\text{ MHz}$	R_g	-	1.1	-	Ω
Input Capacitance at $V_{GS} = 0\text{ V}$, $V_{DS} = 25\text{ V}$, $f = 1\text{ MHz}$	C_{iss}	-	4597	-	pF
Output Capacitance at $V_{GS} = 0\text{ V}$, $V_{DS} = 25\text{ V}$, $f = 1\text{ MHz}$	C_{oss}	-	2133	-	pF
Reverse Transfer Capacitance at $V_{GS} = 0\text{ V}$, $V_{DS} = 25\text{ V}$, $f = 1\text{ MHz}$	C_{rss}	-	110	-	pF
Total Gate Charge at $V_{DS} = 30\text{ V}$, $I_D = 25\text{ A}$, $V_{GS} = 10\text{ V}$	Q_g	-	75	-	nC
Gate Source Charge at $V_{DS} = 30\text{ V}$, $I_D = 25\text{ A}$, $V_{GS} = 10\text{ V}$	Q_{gs}	-	23	-	nC
Gate Drain Charge at $V_{DS} = 30\text{ V}$, $I_D = 25\text{ A}$, $V_{GS} = 10\text{ V}$	Q_{gd}	-	22	-	nC
Turn-On Delay Time at $V_{DS} = 30\text{ V}$, $V_{GS} = 10\text{ V}$, $I_D = 25\text{ A}$, $R_g = 4.7\text{ }\Omega$, $R_L = 1.2\text{ }\Omega$	$t_{d(on)}$	-	39	-	ns
Turn-On Rise Time at $V_{DS} = 30\text{ V}$, $V_{GS} = 10\text{ V}$, $I_D = 25\text{ A}$, $R_g = 4.7\text{ }\Omega$, $R_L = 1.2\text{ }\Omega$	t_r	-	69	-	ns
Turn-Off Delay Time at $V_{DS} = 30\text{ V}$, $V_{GS} = 10\text{ V}$, $I_D = 25\text{ A}$, $R_g = 4.7\text{ }\Omega$, $R_L = 1.2\text{ }\Omega$	$T_{d(off)}$	-	27	-	ns
Turn-Off Fall Time at $V_{DS} = 30\text{ V}$, $V_{GS} = 10\text{ V}$, $I_D = 25\text{ A}$, $R_g = 4.7\text{ }\Omega$, $R_L = 1.2\text{ }\Omega$	t_f	-	9	-	ns
Body-Diode PARAMETERS					
Drain-Source Diode Forward Voltage at $I_S = 100\text{ A}$, $V_{GS} = 0\text{ V}$	V_{SD}	-	-	1.3	V
Body-Diode Continuous Current	I_S	-	-	120	A
Body-Diode Continuous Current, Pulsed	I_{SM}	-	-	480	A
Body Diode Reverse Recovery Time at $I_S = 25\text{ A}$, $di/dt = 100\text{ A}/\mu\text{s}$	t_{rr}	-	44	-	ns
Body Diode Reverse Recovery Charge at $I_S = 25\text{ A}$, $di/dt = 100\text{ A}/\mu\text{s}$	Q_{rr}	-	40	-	nC

Electrical Characteristics Curves

Fig. 1 Typical Output Characteristics

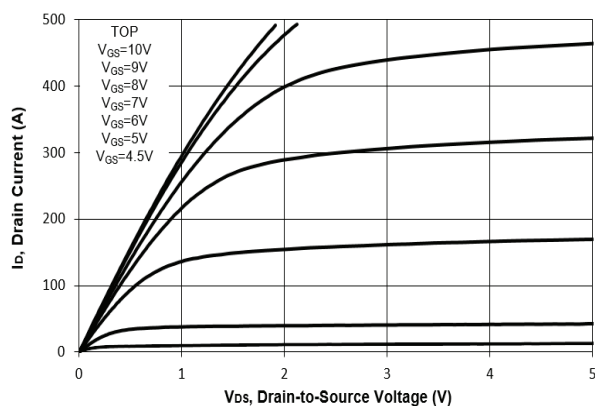


Fig. 2 Typical Transfer Characteristics

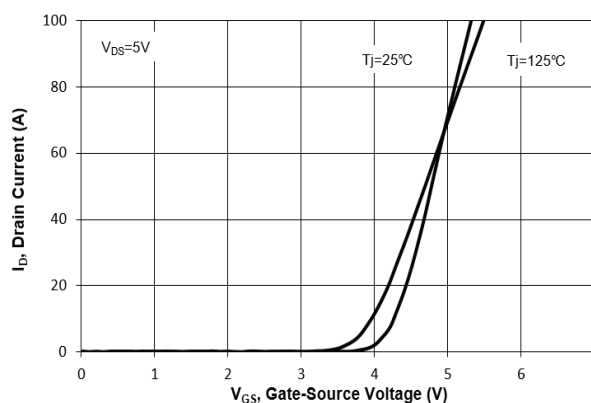


Fig. 3 on-Resistance vs. Drain Current

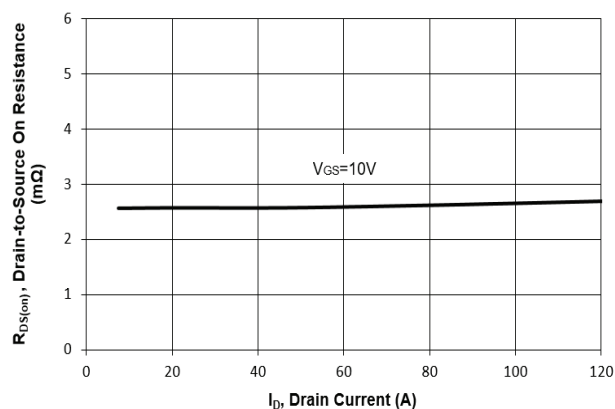


Fig. 4 on-Resistance vs. Gate to Source Voltage

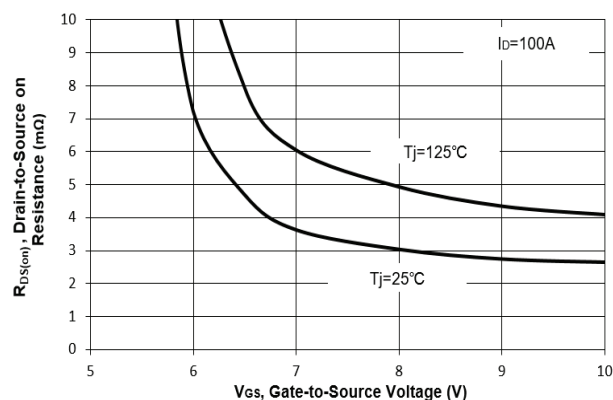


Fig. 5 on-Resistance vs. T_J

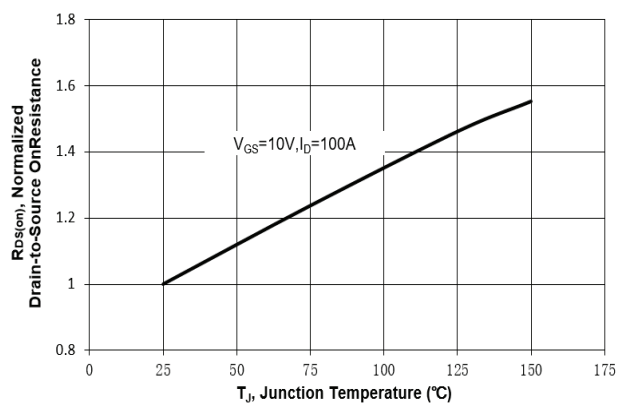
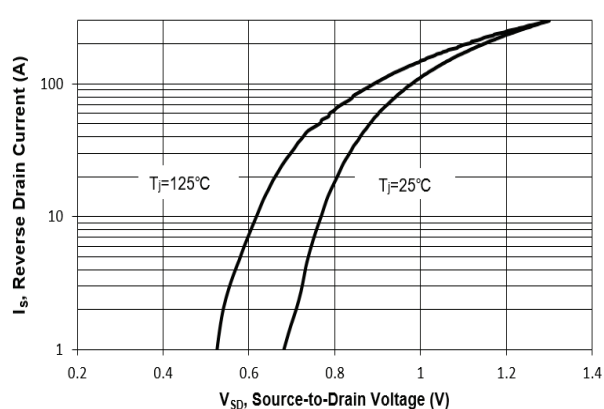


Fig. 6 Typical Body-Diode Forward Characteristics



Electrical Characteristics Curves

Fig. 7 Typical Junction Capacitance

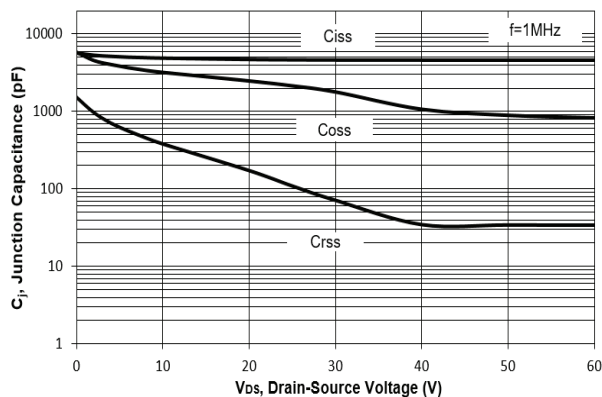


Fig. 8 Drain-Source Leakage Current vs. T_j

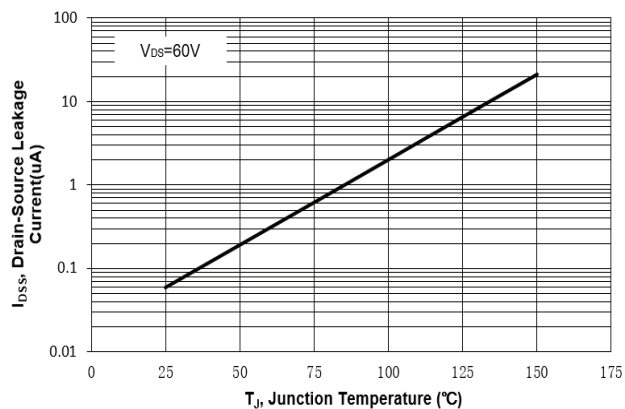


Fig. 9 $V_{(BR)DSS}$ vs. Junction Temperature

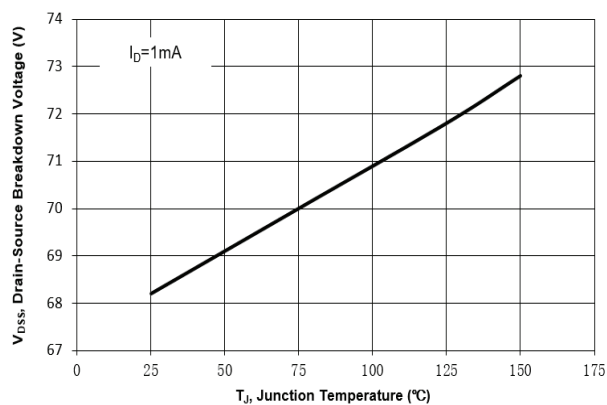


Fig. 10 Gate Threshold Variation vs. T_j

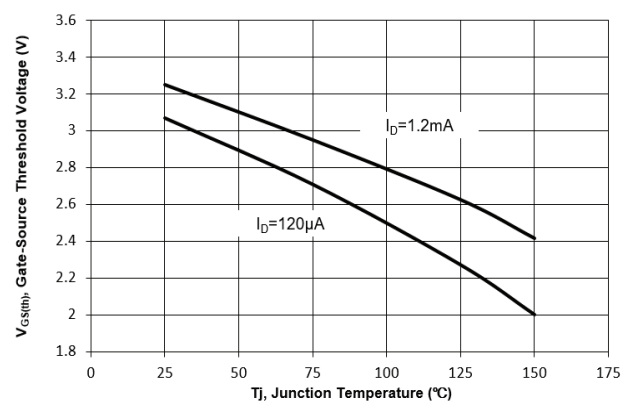


Fig. 11 Gate Charge

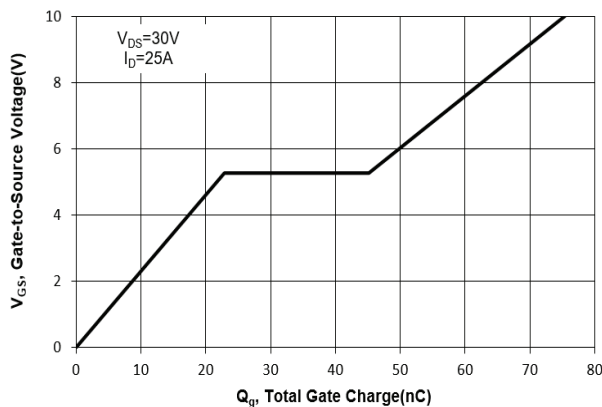
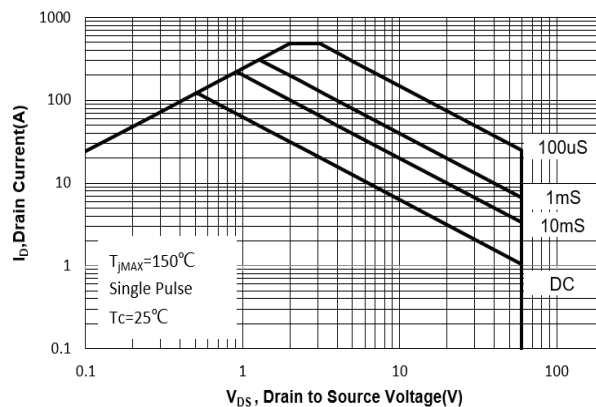


Fig. 12 Safe Operation Area



Electrical Characteristics Curves

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

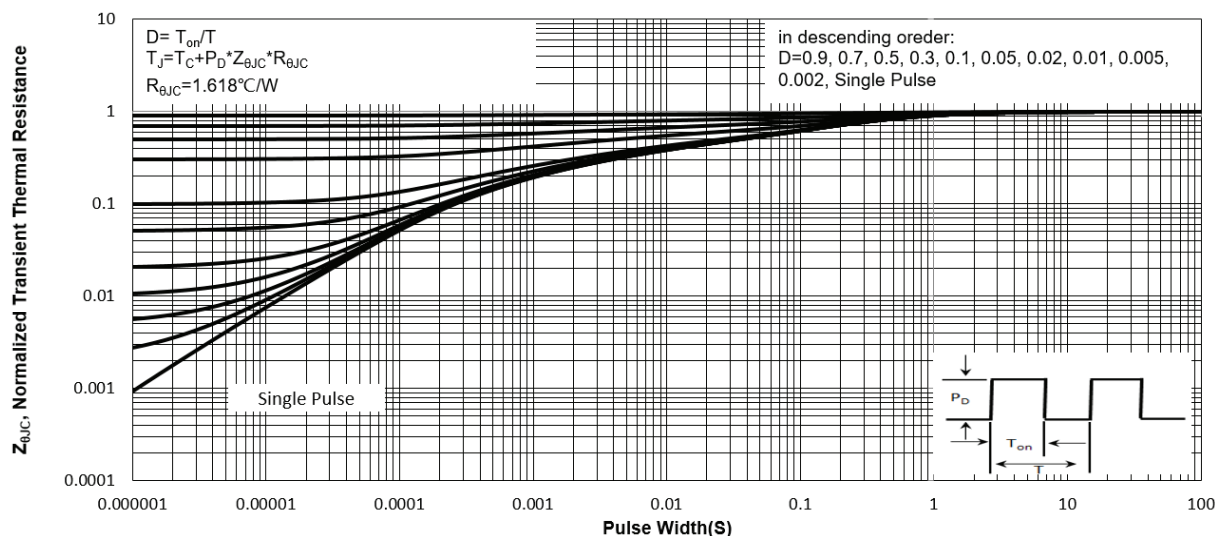
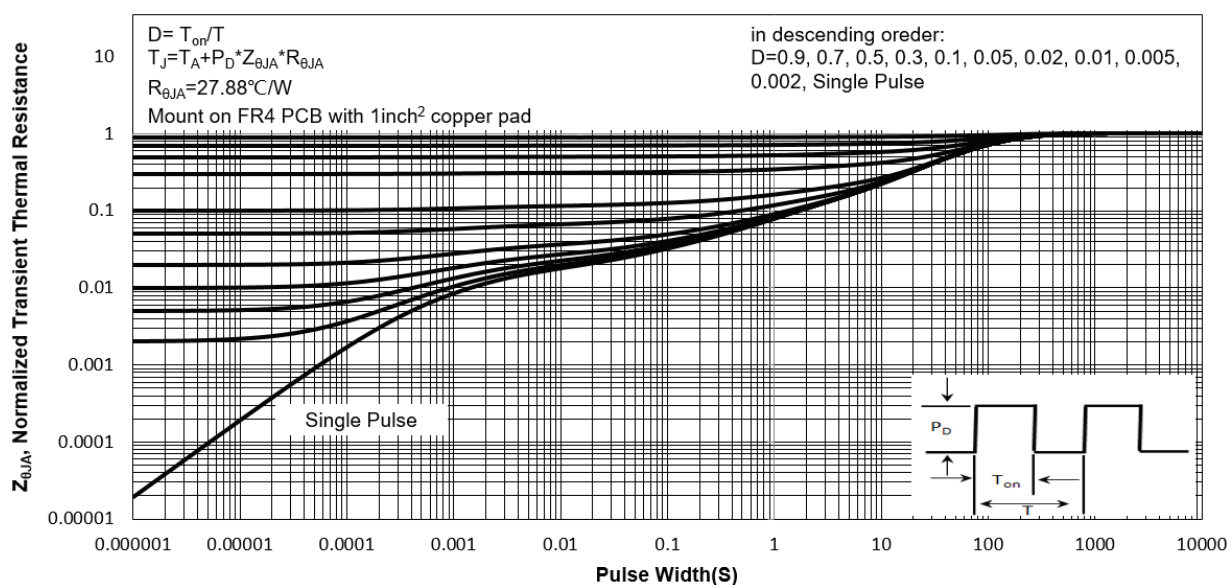
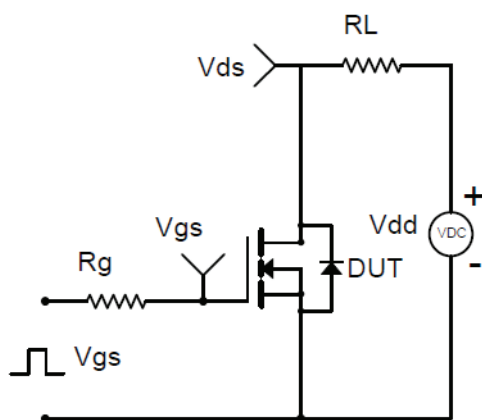
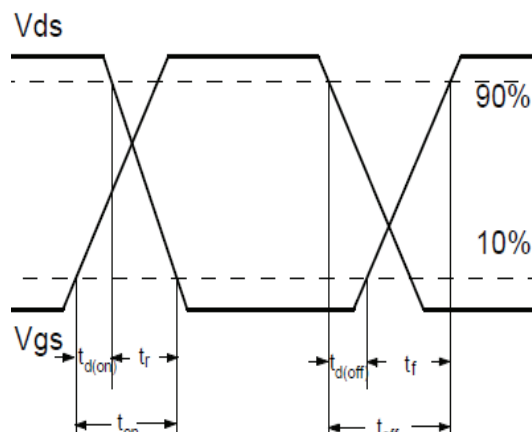
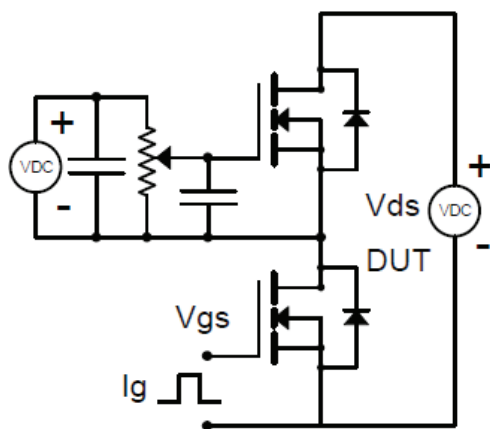
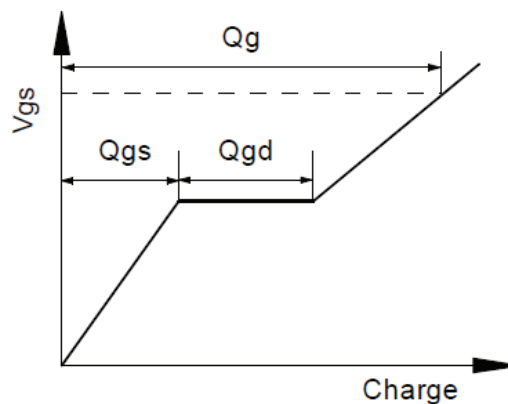
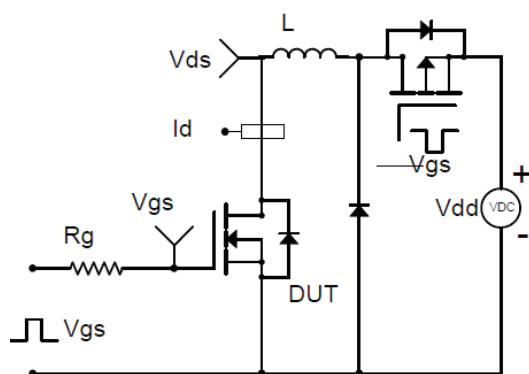
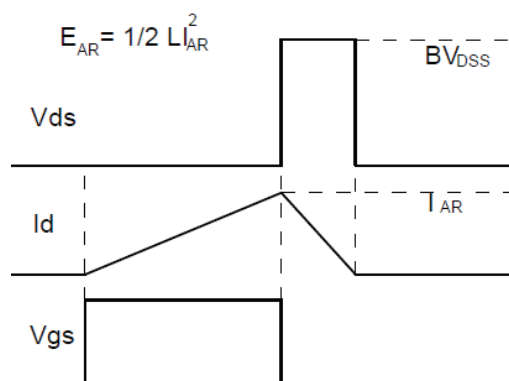


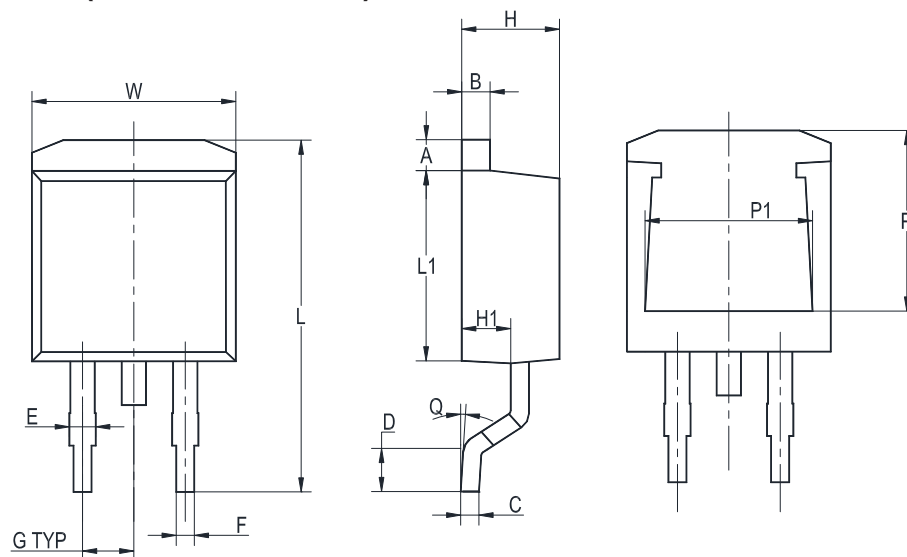
Fig. 14 Normalized Maximum Transient Thermal Impedance($z_{\theta JA}$)



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


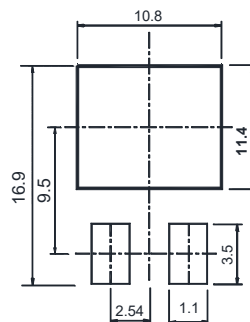
Package Outline (Dimensions in mm)

TO-263



UNIT	A	B	C	D	E	F	G	W	H	H1	L	L1	Q	P	P1
mm	1.5	1.5	0.5	2.60	1.6	0.94	2.54	10.5	4.8	2.9	16.5	8.7	8°	7.6	8.2
	1.1	1.1	0.3	2.15	1.1	0.68	TYP	9.6	4.4	2.5	14.5	8.2	MAX	7.1	7.4

Recommended Soldering Footprint



Packing information

Package	Reel Quantity	Box Quantity	Carton Quantity	Delivery Mode
TO-263	0.8 K / Reel	0.8 K / Box	4K pcs / Carton	Reel

Marking information

" TV06N028S " = Part No.

" ***** " = Date Code Marking

Font type: Arial



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