

Product Summary

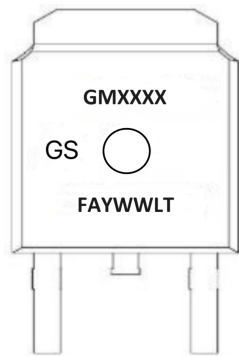
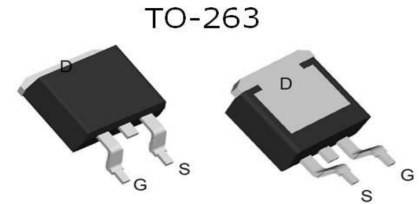
V_{DS} (V)	$R_{DS(on),max}$ (mΩ)	I_D (A)
150	7.2 @ $V_{GS} = 10V$	130 ⁽¹⁾

Features

- Low $R_{DS(on)}$ trench technology
- Low thermal impedance
- Fast switching speed
- 100% avalanche tested

Application

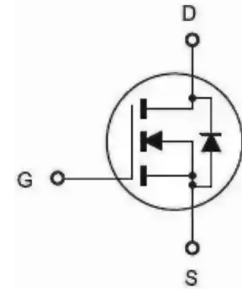
- DC/DC conversion
- Power switch
- Motor drives



TO-263

NOTE:
 LOGO - GS
 GMXXXXX- Part number code
 F - Fab location code
 A - Assembly location code
 Y - Year code
 WW - Week code
 L&T - Assembly lot code

Equivalent circuit



Absolute maximum rating@25°C

Parameter	Symbol	Limit	Unit
Drain-source voltage	V_{DS}	150	V
Gate-source voltage	V_{GS}	±20	
Continuous drain current	$T_C=25^\circ\text{C}$ ⁽¹⁾	130	A
	$T_C=100^\circ\text{C}$	92	
	$T_A=25^\circ\text{C}$ ⁽⁴⁾	14	
Pulsed drain current ⁽²⁾	$I_{D,pulse}$	520	
Avalanche energy, single pulse ⁽³⁾	E_{AS}	720	mJ
Power dissipation	$T_C=25^\circ\text{C}$	291	W
	$T_A=25^\circ\text{C}$ ⁽⁴⁾	3.7	
Operating junction and storage temperature range	T_J, T_{stg}	-55 to 150	°C

Thermal Characteristic

Parameter	Symbol	Max.	Unit
Thermal resistance, junction-to-case	$R_{\theta JC}$	0.52	°C/W
Thermal resistance, junction-to-ambient ⁽⁴⁾	$R_{\theta JA}$	40	

Electrical Characteristics (T_J=25°C unless otherwise noted)

Parameter	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Static parameter						
Drain to source breakdown voltage	V _{(BR)DSS}	V _{GS} = 0 V, I _D = 250 μA	150			V
Gate-source threshold voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA	2.2	2.7	3.8	V
Gate-body leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ±20 V			±100	nA
Zero gate voltage drain current	I _{DSS}	V _{DS} = 150 V, V _{GS} = 0 V			1	μA
Drain-source on-resistance	R _{DS(on)}	V _{GS} = 10 V, I _D = 100 A		5.8	7.2	mΩ
Forward transconductance ⁽⁵⁾	g _{fs}	V _{DS} = 5 V, I _D = 100 A		175		S
Gate resistance	R _g	f = 1 MHz		2		Ω
Dynamic ⁽⁵⁾						
Total gate charge	Q _g	V _{DS} = 75 V, I _D = 100 A, V _{GS} = 10 V		144		nC
Gate-source charge	Q _{gs}			37		
Gate-drain charge	Q _{gd}			47		
Turn-on delay time	t _{d(on)}	V _{DS} = 75 V, I _D = 100 A, V _{GS} = 10 V, R _{GEN} = 6 Ω		63		ns
Rise time	t _r			67		
Turn-off delay time	t _{d(off)}			135		
Fall time	t _f			51		
Input capacitance	C _{iss}	V _{DS} = 75 V, V _{GS} = 0 V, f = 1 MHz		8090		pF
Output capacitance	C _{oss}			533		
Reverse transfer capacitance	C _{rss}			31		
Reverse Diode Characteristics ⁽⁵⁾						
Diode forward voltage	V _{SD}	V _{GS} = 0 V, I _F = 100 A		1	1.2	V
Reverse recovery time	t _{rr}	V _{DS} = 75 V, I _F = 100 A, di/dt = 100 A/μs		117		ns
Reverse recovery charge	Q _{rr}			446		nC

Notes

- (1) Limited by maximum junction temperature.
- (2) Pulse width limited by maximum junction temperature.
- (3) V_{DS} = 75 V, V_{GS} = 10 V, L = 0.3 mH.
- (4) R_{θJA} is determined with the device mounted on a 1 in² pad 2 oz copper pad on a 1.5x1.5 in. board of FR-4 material.
- (5) Guaranteed by design, not subject to production testing.

Typical Performance Characteristics

Fig.1 Typ. transfer characteristics

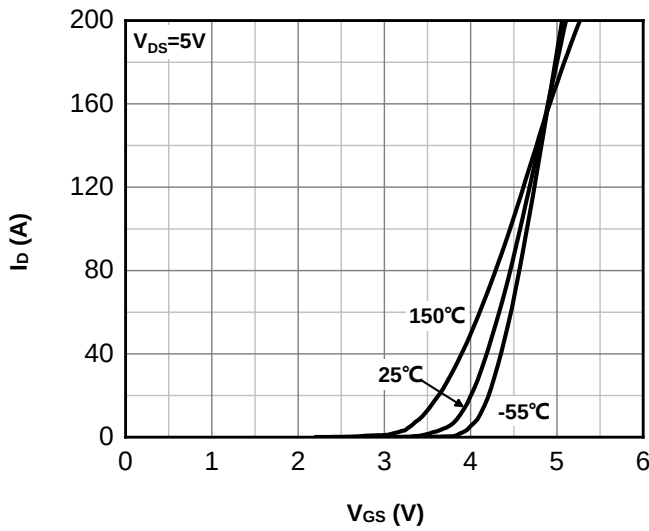


Fig.2 Typ. output characteristics

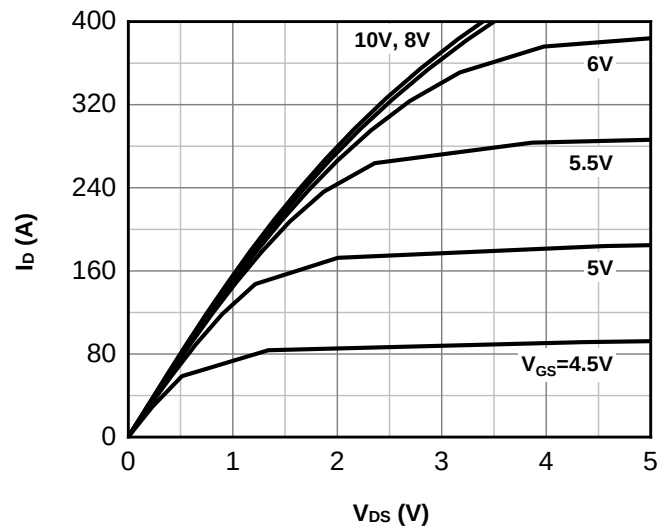


Fig.3 Normalized on-resistance vs drain current

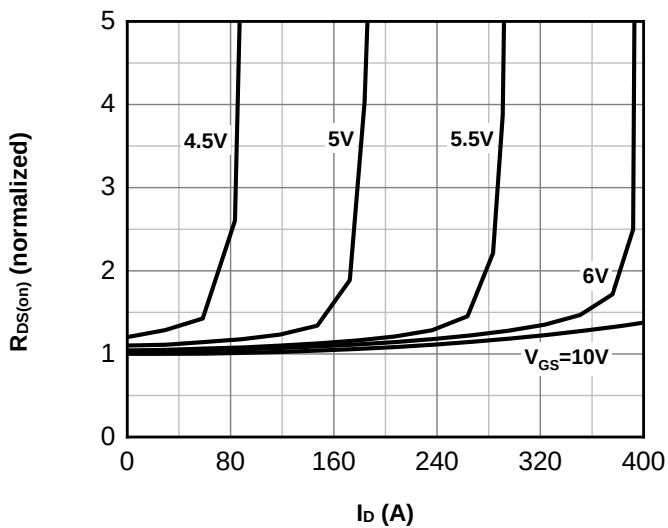


Fig.4 Typ. on-resistance vs gate-source voltage

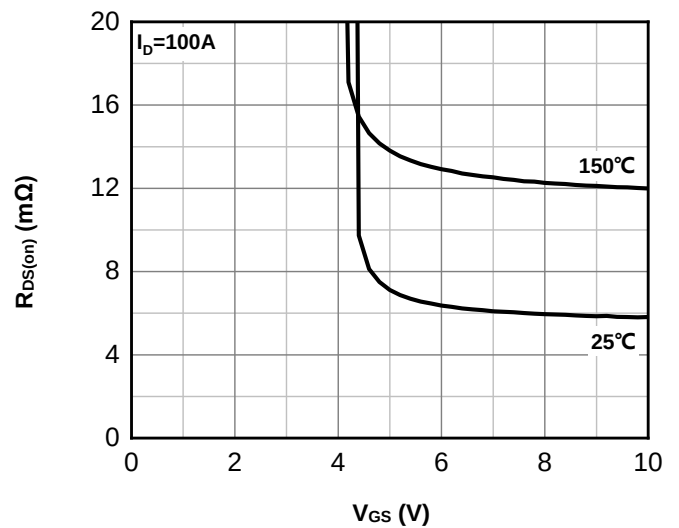


Fig.5 Normalized on-resistance vs junction temperature

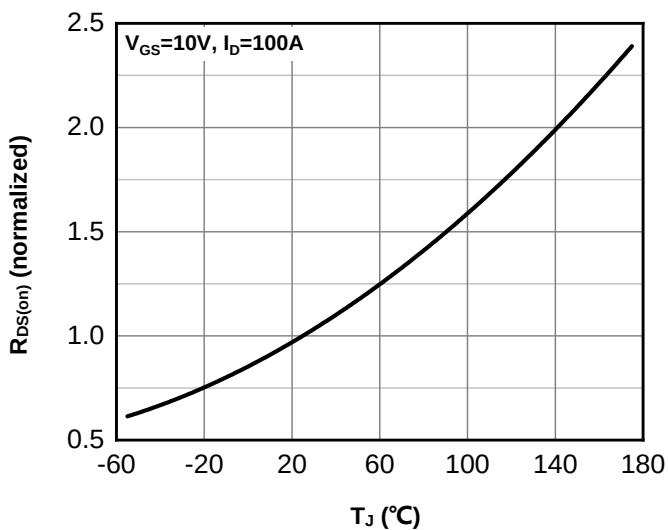
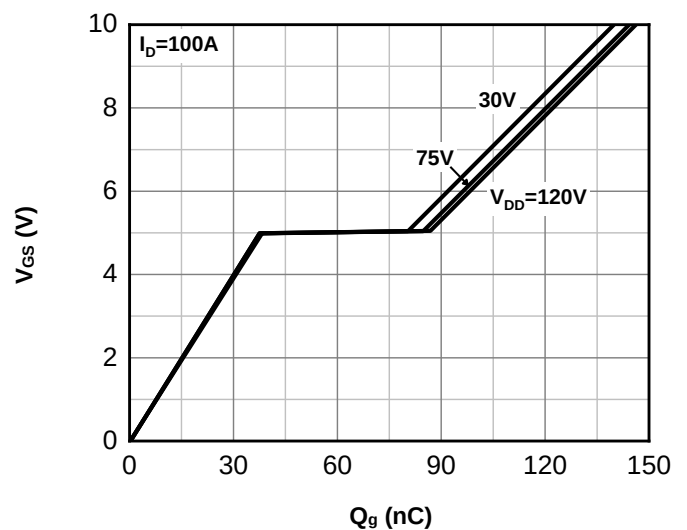
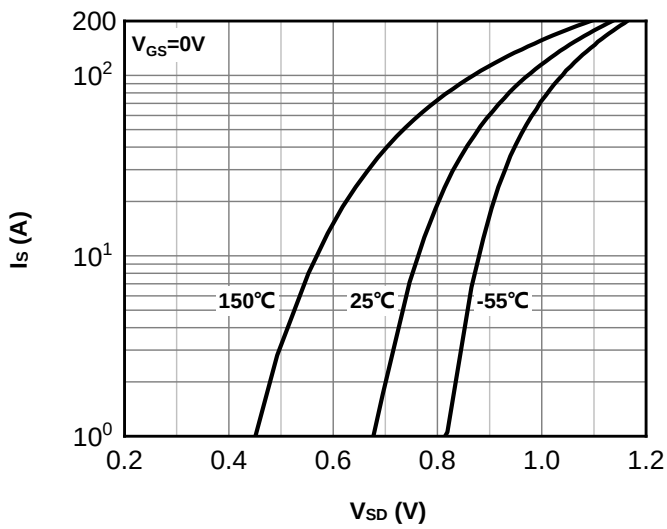
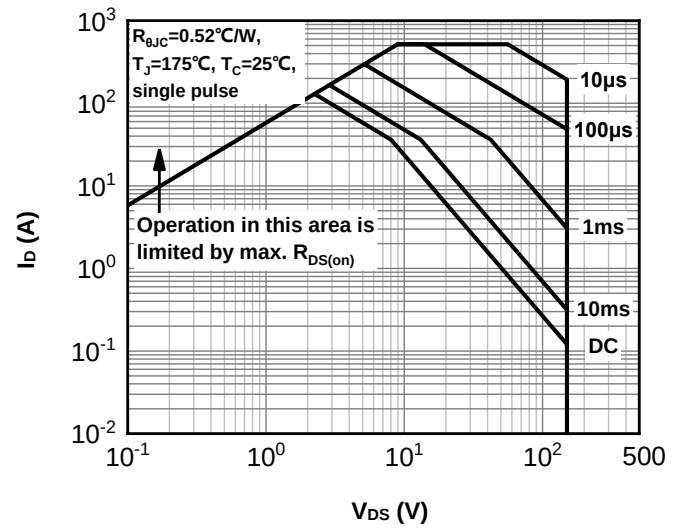
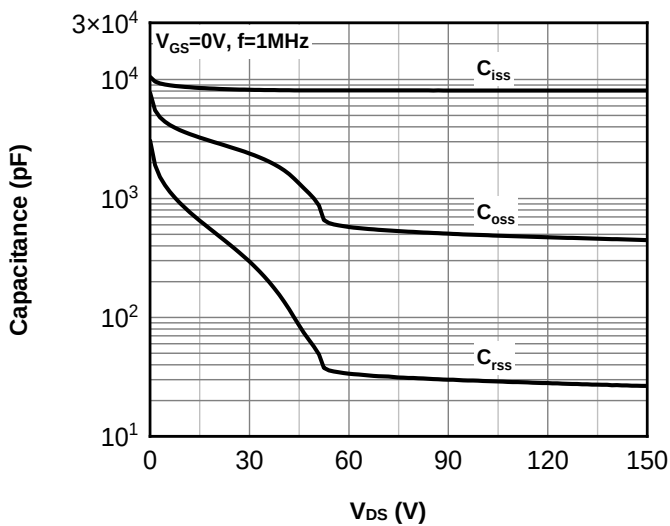
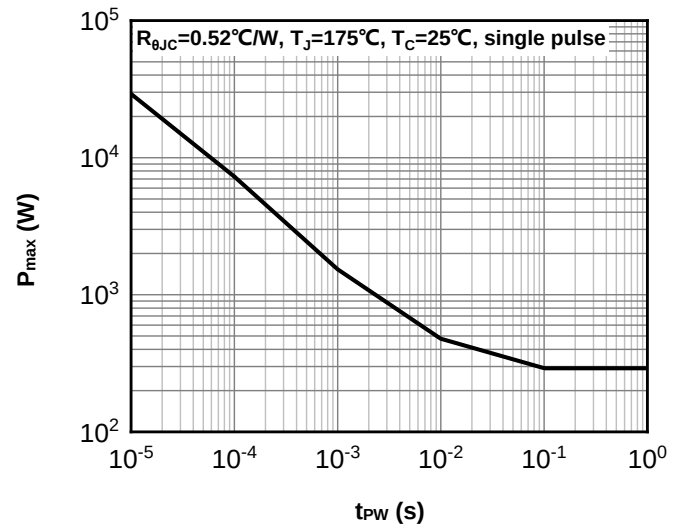
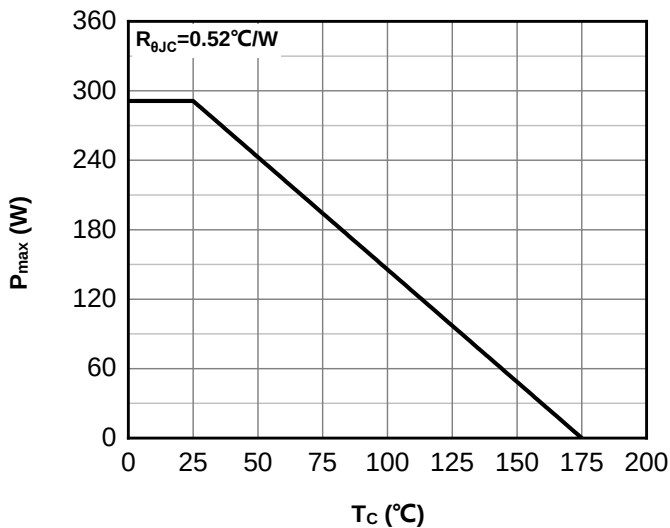
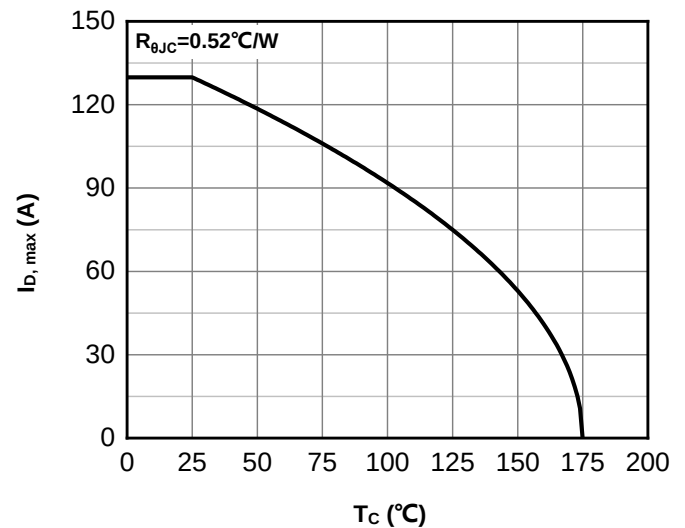
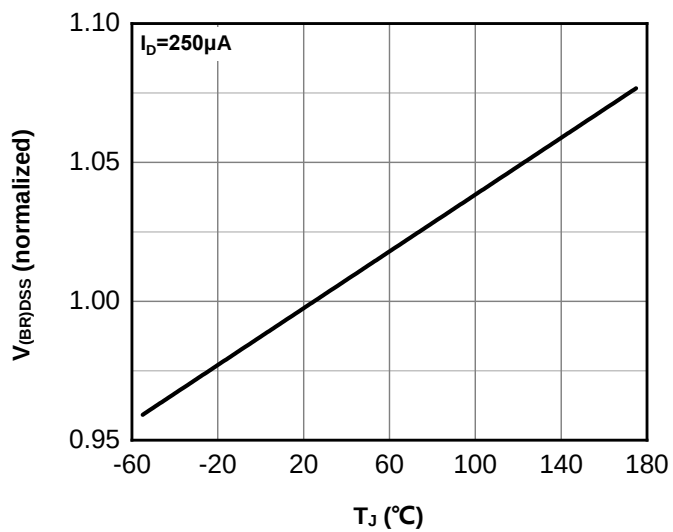
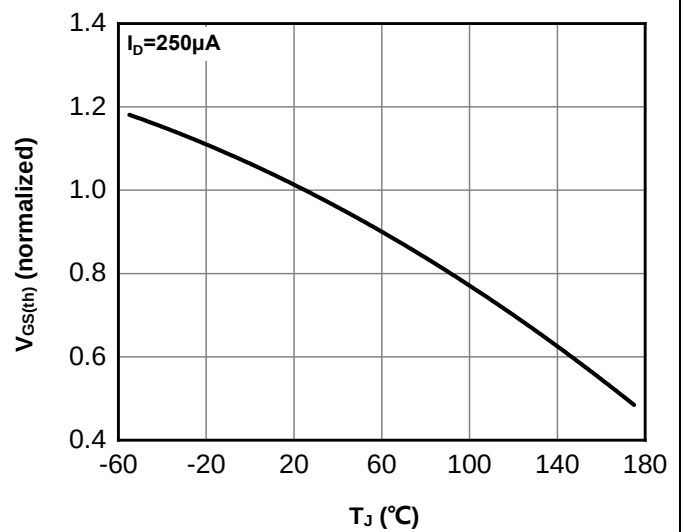
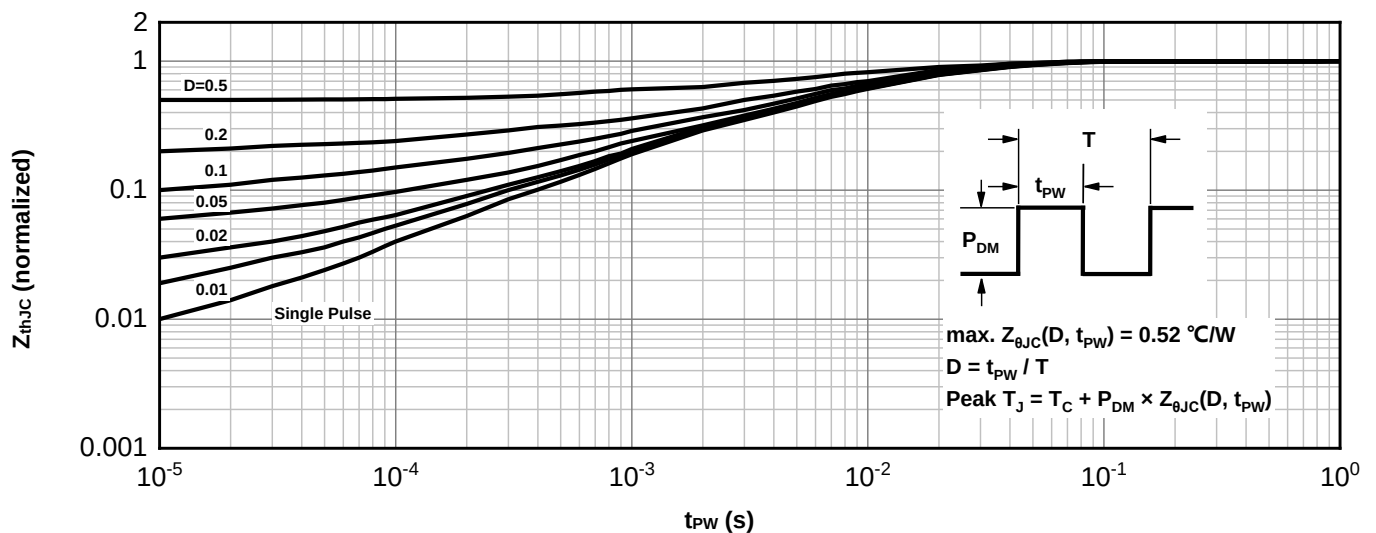


Fig.6 Typ. gate charge



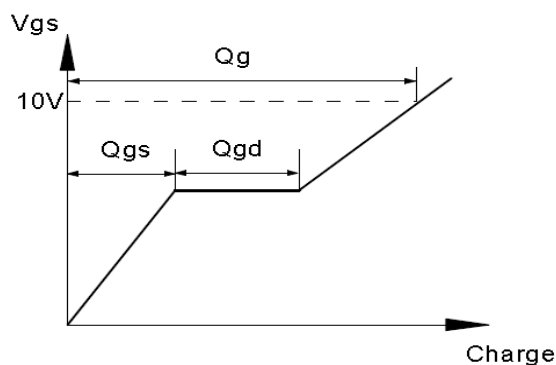
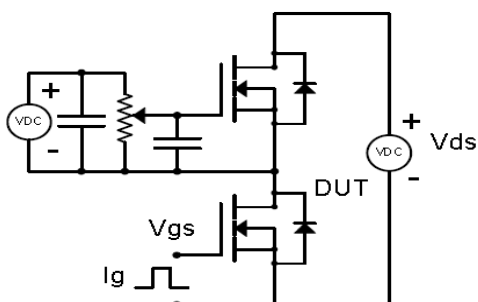
Typical Performance Characteristics

Fig.7 Typ. forward characteristics of body diode

Fig.8 Safe operating area

Fig.9 Typ. Capacitance

Fig.10 Single pulse maximum power dissipation

Fig.11 Max. power dissipation vs case temperature

Fig.12 Max. continuous drain current vs case temperature


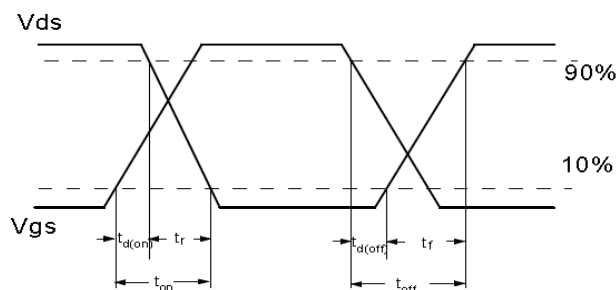
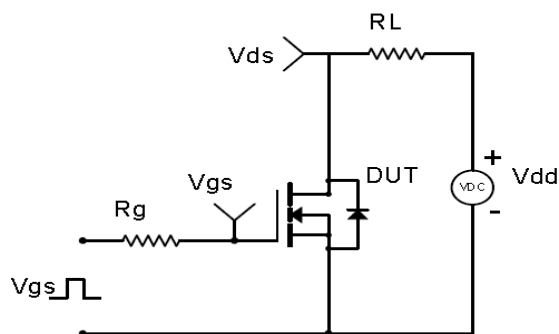
Typical Performance Characteristics
Fig.13 Normalized $V_{(BR)DSS}$ vs junction temperature

Fig.14 Normalized $V_{GS(th)}$ vs junction temperature

Fig.15 Normalized transient thermal impedance from junction to case


Test Circuit & Waveform

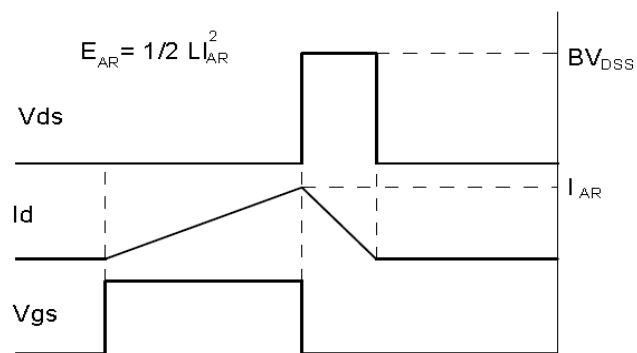
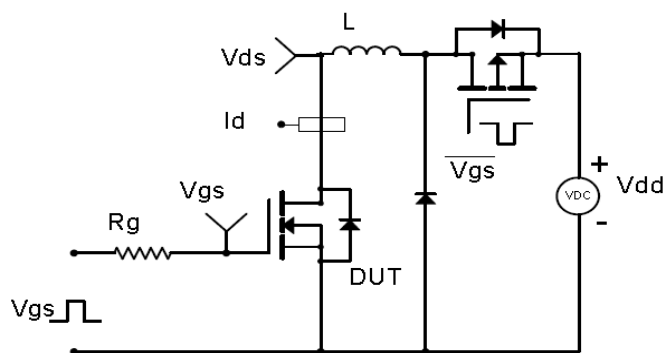
Gate Charge Test Circuit & Waveform



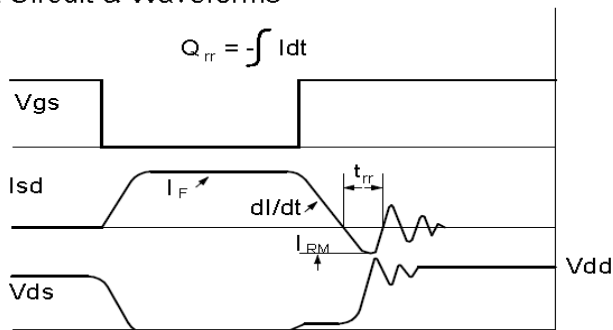
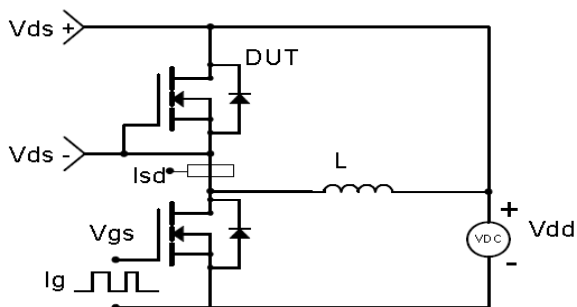
Resistive Switching Test Circuit & Waveforms

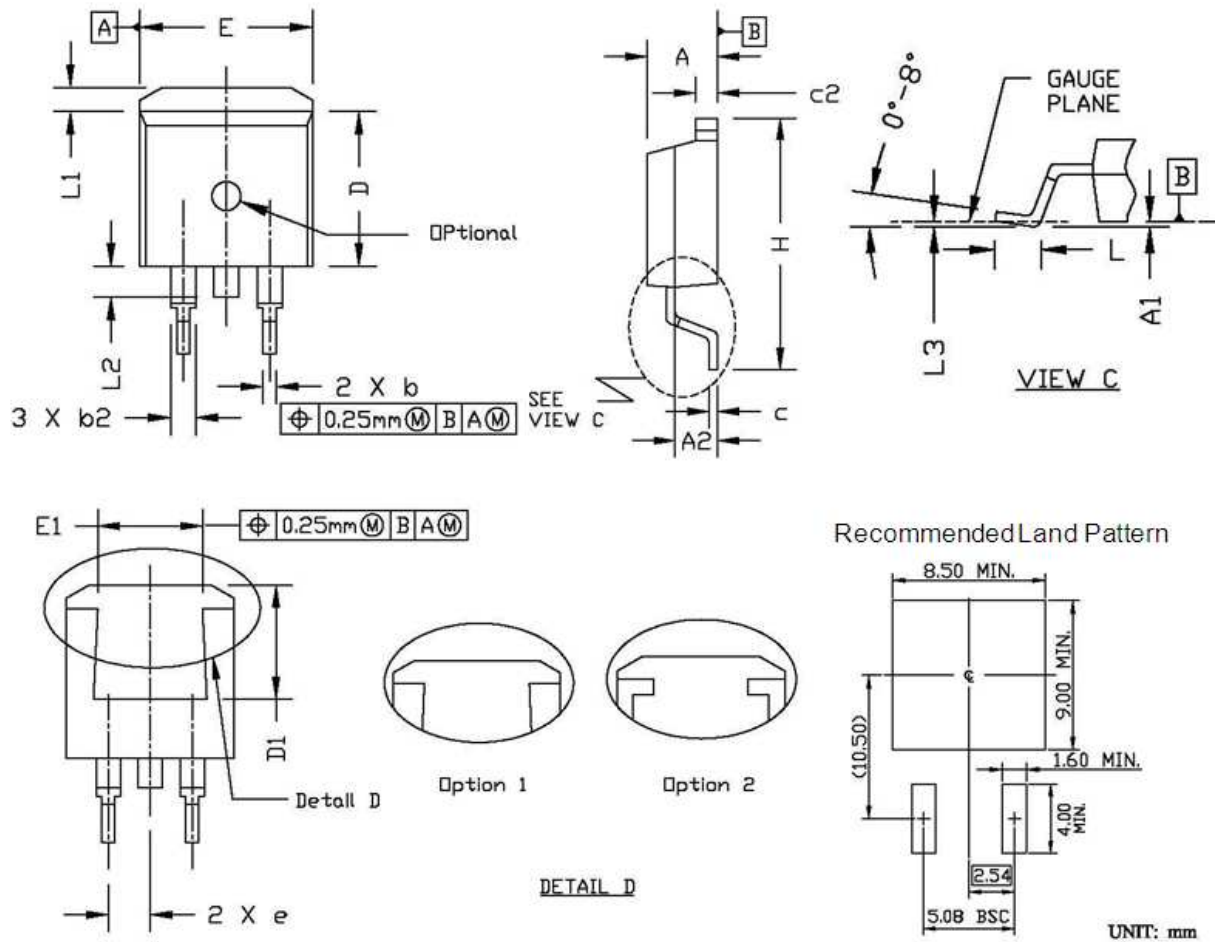


Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Outline Drawing TO-263
Package Outline: TO-263


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.30	4.86	0.169	0.191
A1	0.00	0.25	0.000	0.010
A2	2.34	2.79	0.092	0.110
b	0.68	0.94	0.027	0.037
b2	1.15	1.35	0.045	0.053
c	0.33	0.65	0.013	0.026
c2	1.17	1.40	0.046	0.055
D	8.38	9.45	0.330	0.372
D1	6.90	8.17	0.272	0.322
e	2.54 BSC.		0.100 BSC.	
E	9.78	10.50	0.385	0.413
E1	6.50	8.60	0.256	0.339
H	14.61	15.88	0.575	0.625
L	2.24	3.00	0.088	0.118
L1	0.70	1.60	0.028	0.063
L2	1.00	1.78	0.039	0.070
L3	0.00	0.25	0.000	0.010

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