

Product Summary

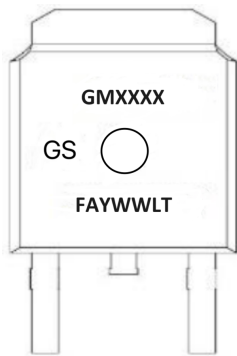
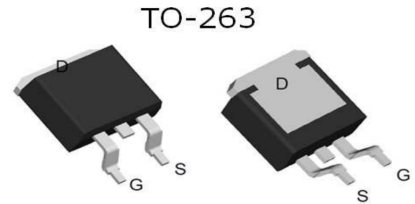
V _{DS} (V)	R _{DS(on)} ,max (mΩ)	I _D (A)
110	4.0 @ V _{GS} = 10V	120 ⁽¹⁾

Features

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

Application

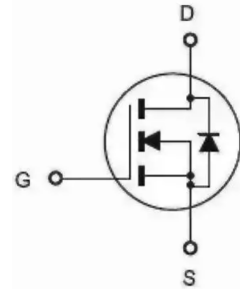
- DC/DC conversion
- Power switch
- Motor drives



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}	110	V
Gate-source voltage	V _{GS}	±20	
Continuous drain current	T _C =25°C ⁽¹⁾	120	A
	T _C =100°C	109	
	T _A =25°C ⁽⁴⁾	20	
Pulsed drain current ⁽²⁾	I _{D,pulse}	480	
Avalanche energy, single pulse ⁽³⁾	E _{AS}	303	mJ
Power dissipation	T _C =25°C	198	W
	T _A =25°C ⁽⁴⁾	3.1	
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 _{θJC}	0.63	°C/W
Thermal resistance, junction-to-ambient ⁽⁴⁾	R _{θJA}	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 = 1 mA	110	119		V
Gate-source threshold voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA	2.2	3	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} = 105 V, V _{GS} = 0 V			1	μA
Drain-source on-resistance	R _{DS(on)}	V _{GS} = 10 V, I _D = 50 A		3.2	4.0	mΩ
Forward transconductance ⁽⁵⁾	g _{fs}	V _{DS} = 5 V, I _D = 50 A		140		S
Gate resistance	R _g	f = 1 MHz		1.2		Ω
Dynamic ⁽⁵⁾						
Total gate charge	Q _g	V _{DS} = 50 V, I _D = 50 A, V _{GS} = 10 V		114		nC
Gate-source charge	Q _{gs}			29		
Gate-drain charge	Q _{gd}			32		
Turn-on delay time	t _{d(on)}	V _{DS} = 50 V, I _D = 50 A, V _{GS} = 10 V, R _{GEN} = 6 Ω		58		ns
Rise time	t _r			83		
Turn-off delay time	t _{d(off)}			76		
Fall time	t _f			70		
Input capacitance	C _{iss}	V _{DS} = 50 V, V _{GS} = 0 V, f = 1 MHz		6750		pF
Output capacitance	C _{oss}			1480		
Reverse transfer capacitance	C _{rss}			61		
Reverse Diode Characteristics ⁽⁵⁾						
Diode forward voltage	V _{SD}	V _{GS} = 0 V, I _F = 50 A		0.9	1.2	V
Reverse recovery time	t _{rr}	V _{DS} = 50 V, I _F = 50 A, di/dt = 100 A/μs		84		ns
Reverse recovery charge	Q _{rr}			218		nC

Notes

- (1) Package limited. The maximum continuous drain current limited by silicon is 172A at T_C=25°C.
- (2) Pulse width limited by maximum junction temperature.
- (3) V_{DS} = 50 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

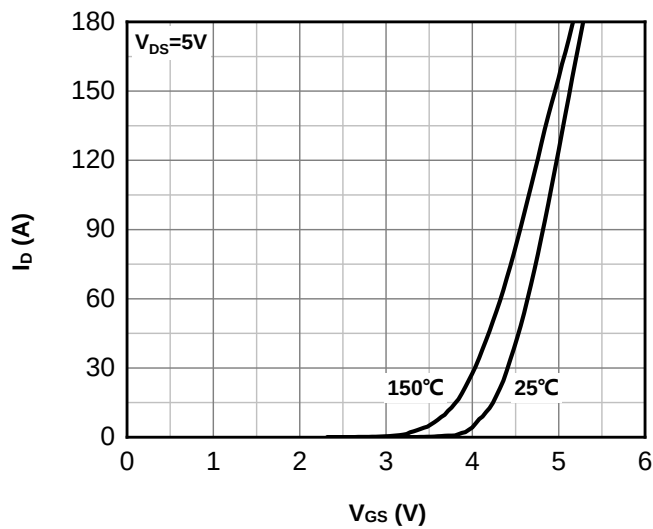


Fig.2 Typ. output characteristics

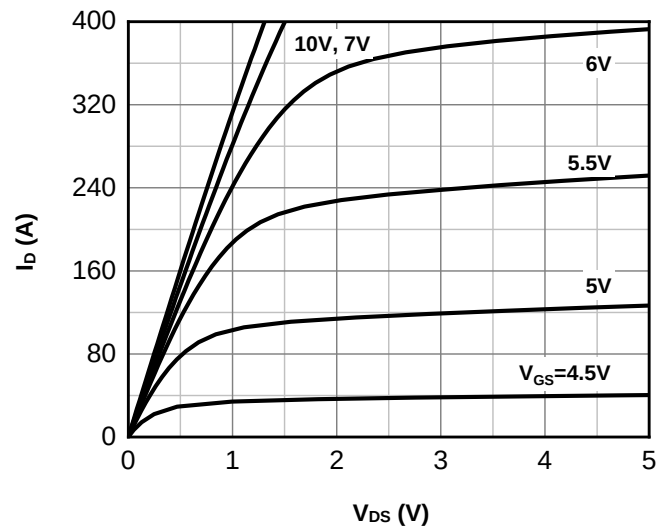


Fig.3 Normalized on-resistance vs drain current

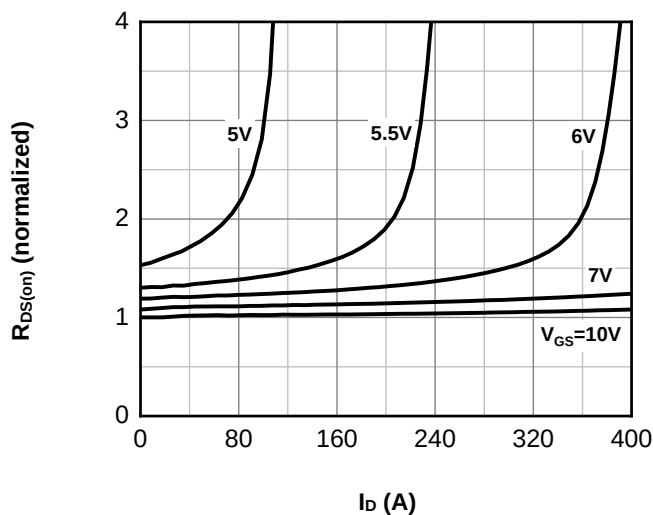


Fig.4 Typ. on-resistance vs gate-source voltage

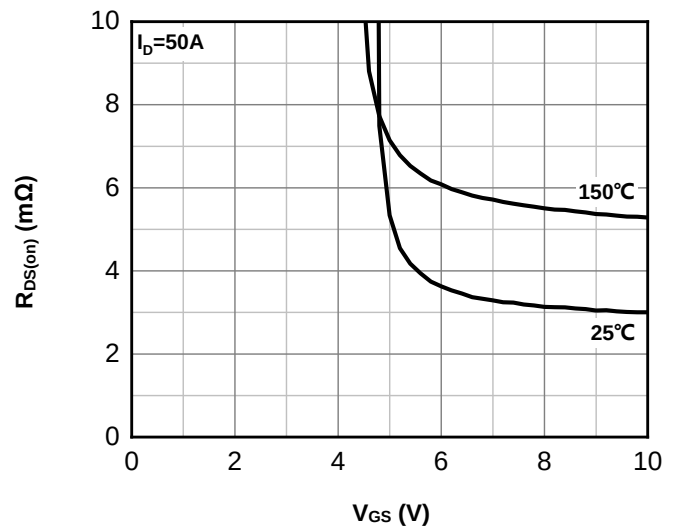


Fig.5 Normalized on-resistance vs junction temperature

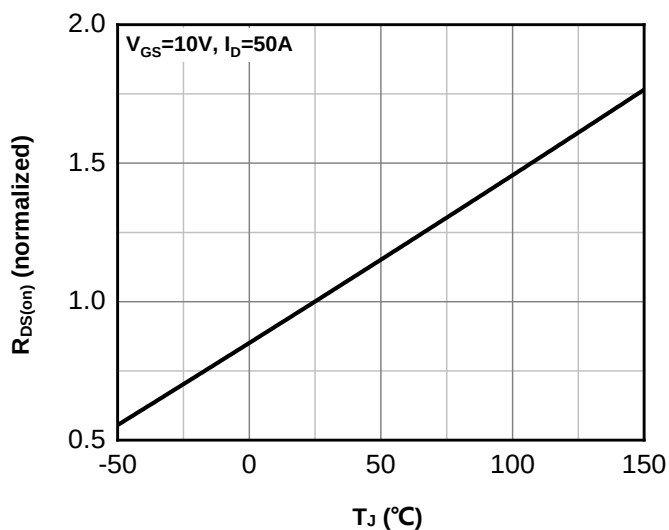
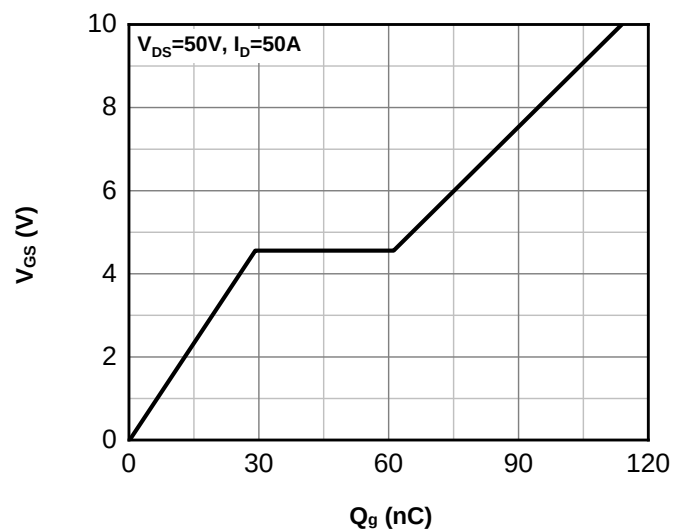


Fig.6 Typ. gate charge



Typical Performance Characteristics

Fig.7 Typ. forward characteristics of body diode

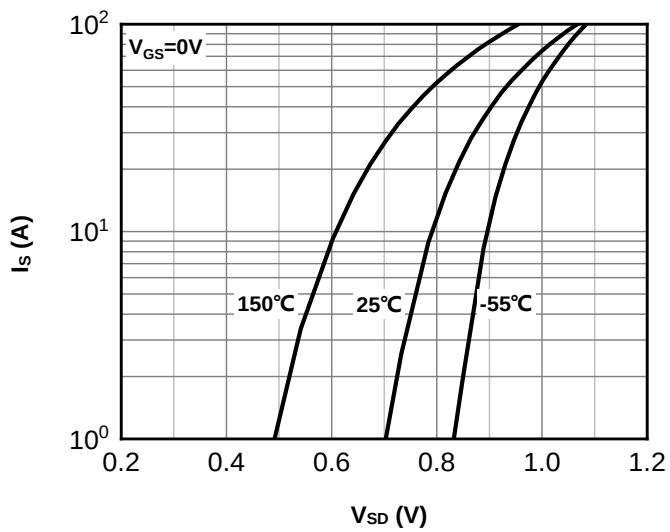


Fig.8 Safe operating area

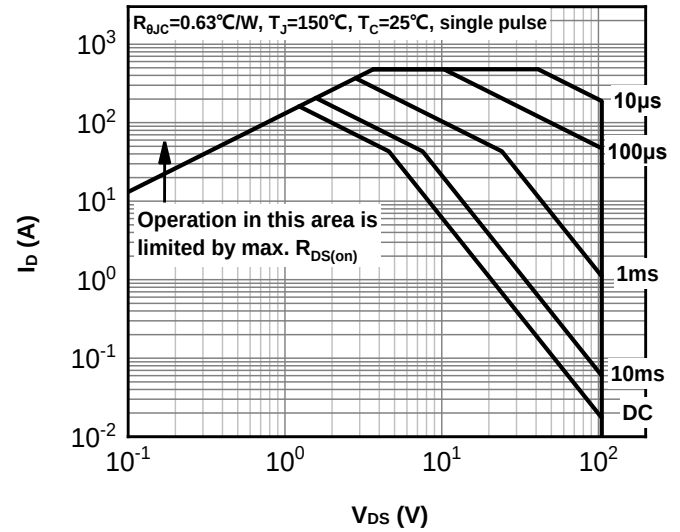


Fig.9 Typ. Capacitance

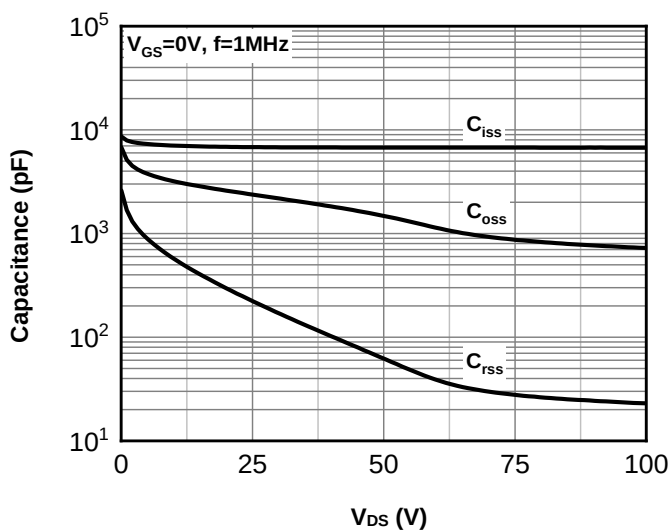


Fig.10 Single pulse maximum power dissipation

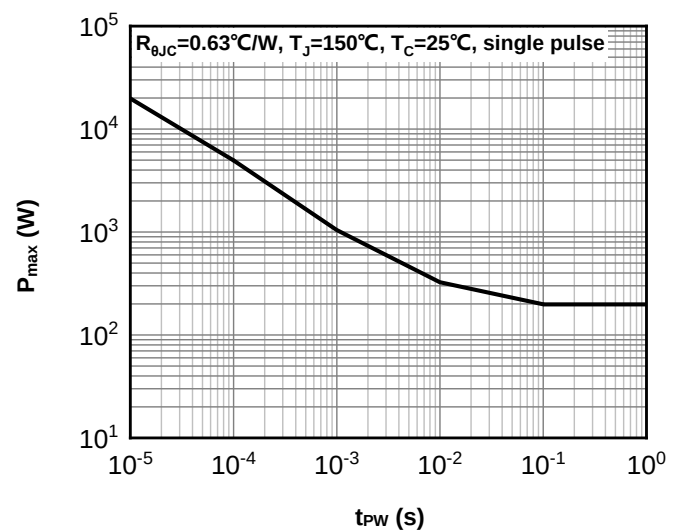


Fig.11 Max. power dissipation vs case temperature

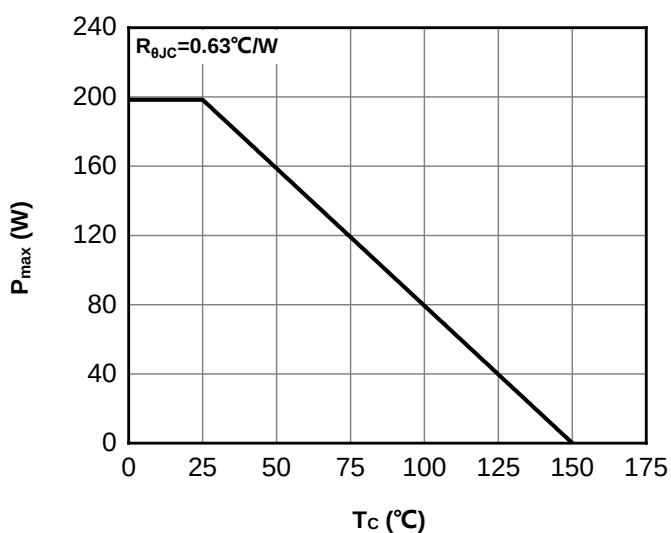
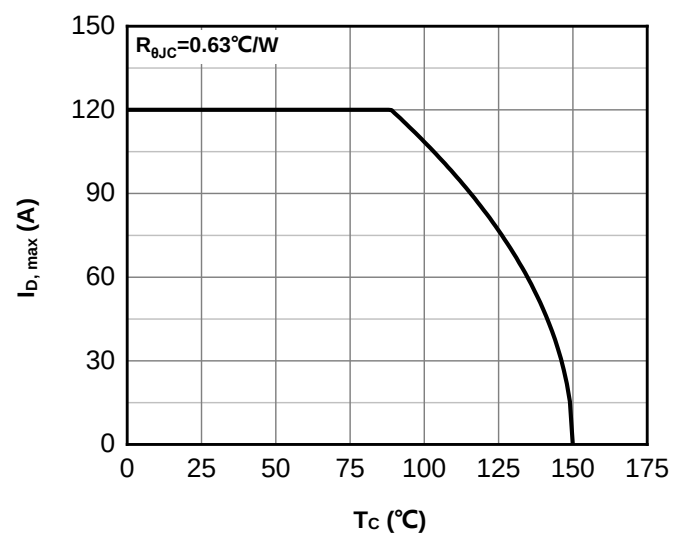
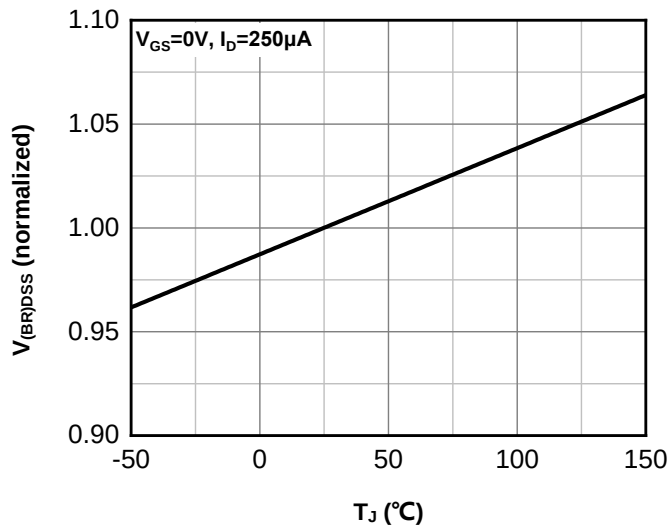
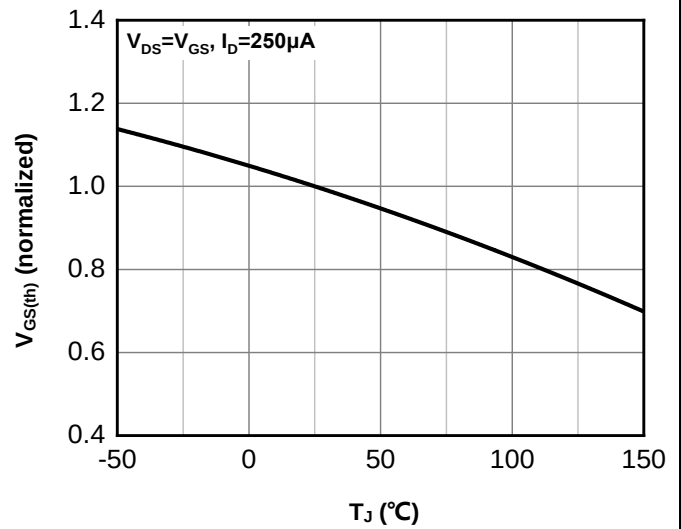
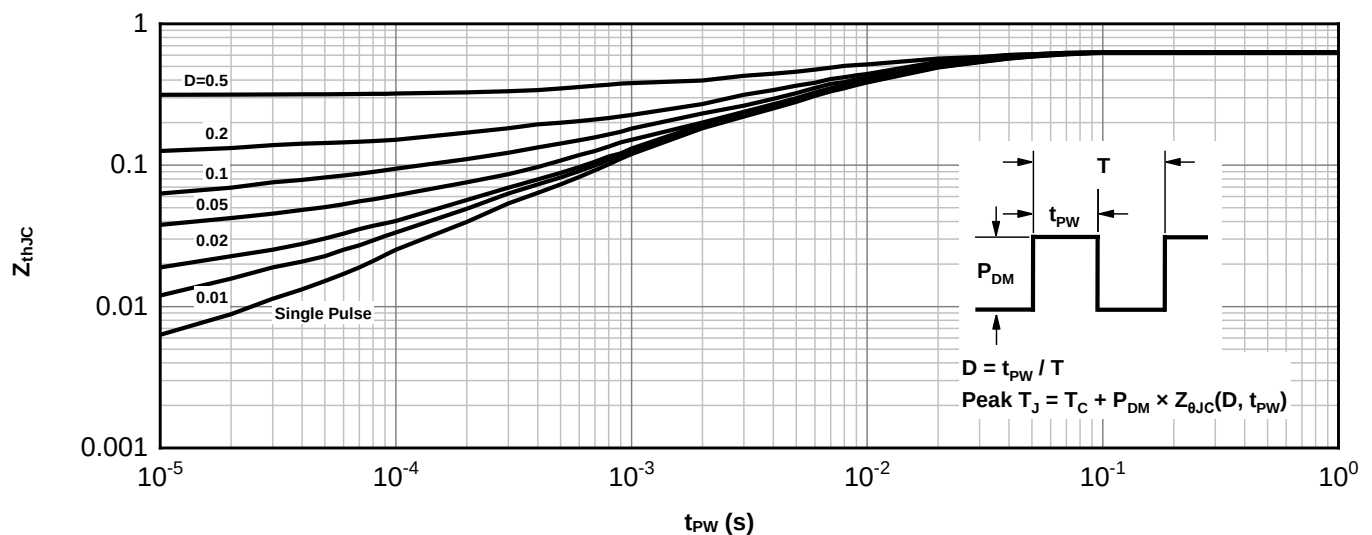


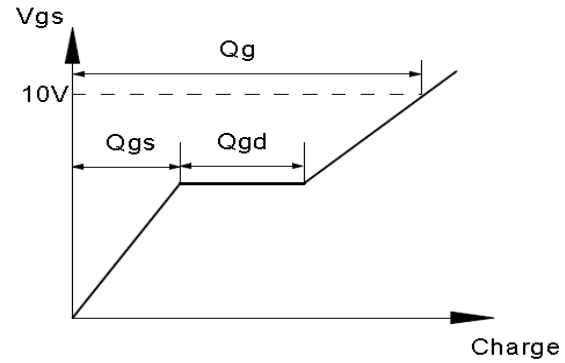
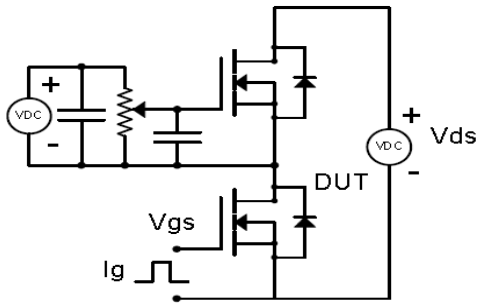
Fig.12 Max. continuous drain current vs case temperature



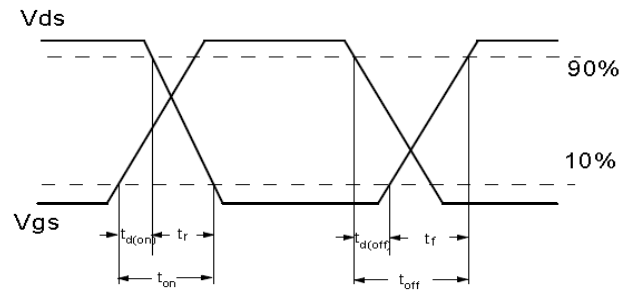
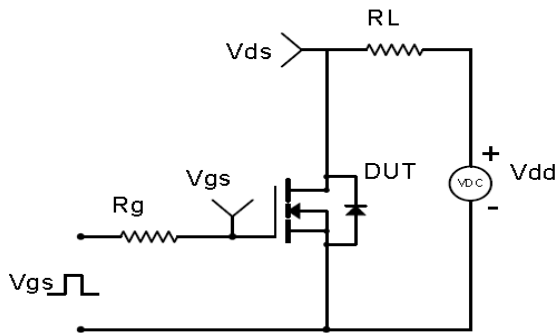
Typical Performance Characteristics
Fig.13 Normalized $V_{(BR)DSS}$ vs junction temperature

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

Fig.15 Transient thermal impedance from junction to case


Test Circuit & Wavefor

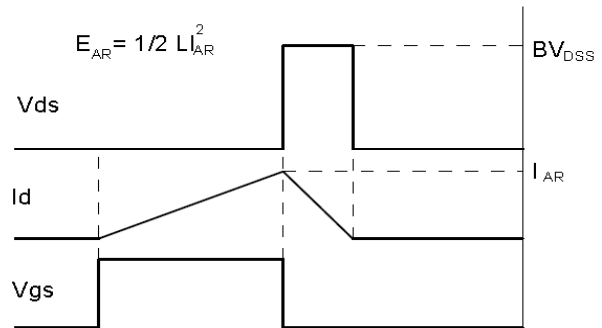
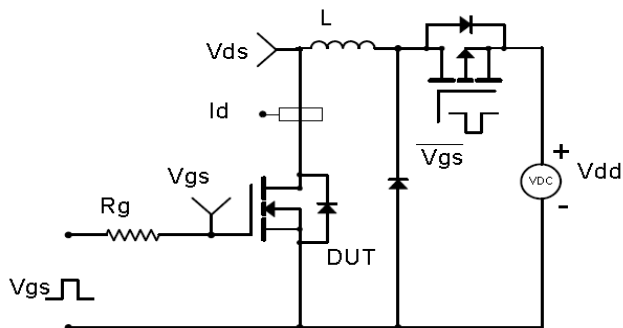
Gate Charge Test Circuit & Waveform



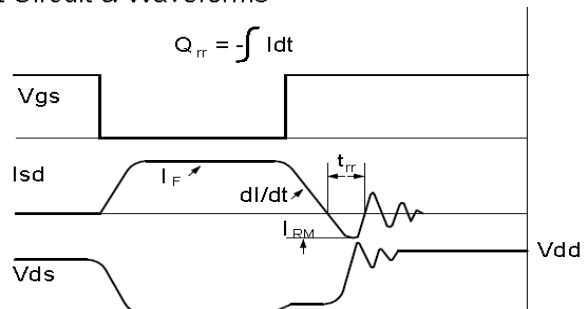
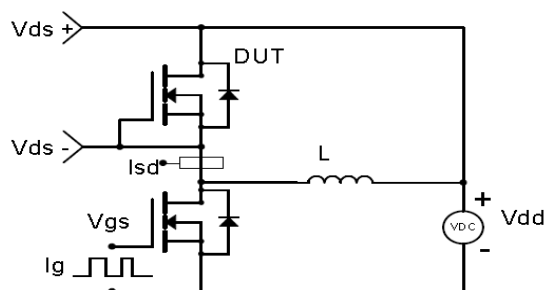
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



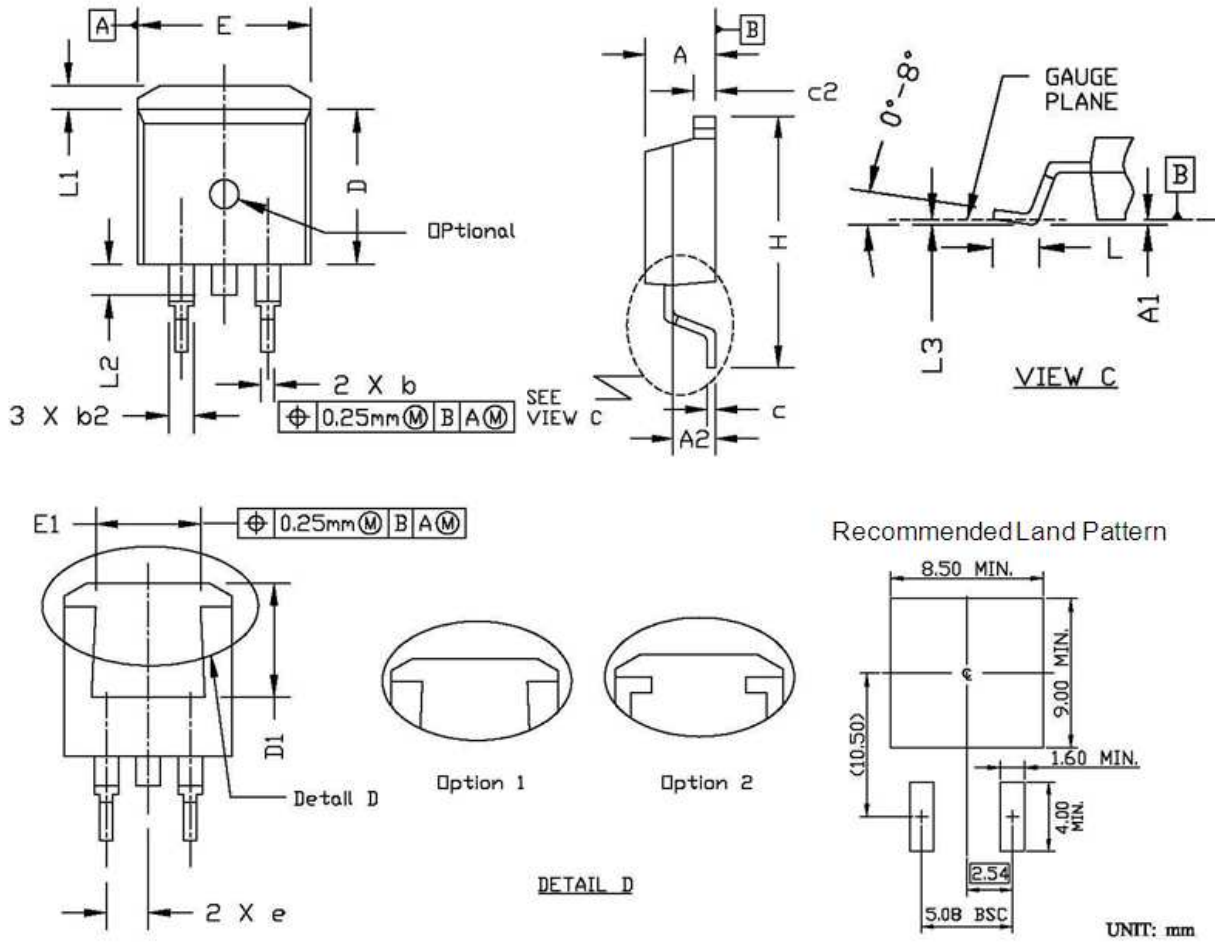


gostone

GMS040N11L3

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

Important Notice

The information given in this document shall be for illustrative purposes only and shall in no event be regarded as a guarantee of conditions or characteristics. Gostone reserves the right to change any information herein. With respect to any examples, hints or any typical values stated herein and/or any information regarding the application of the product, Gostone or its affiliates hereby make no representation or warranty of any kind, expressed or implied, as to any information provided hereunder, including without limitation as to the accuracy, completeness or non-infringement of intellectual property rights of any third party, and they assume no liability for the consequences of use of such information. In addition, any information given in this document is subject to customer's compliance with its obligations stated herein and any applicable legal requirements, norms and standards concerning customer's products and any use of the product of Gostone in customer's applications. The information contained herein is exclusively intended for technically trained staff. No license is granted by implication under any patent right, copyright, mask work right, or other intellectual property right. It is customer's sole responsibility to evaluate the suitability of the product for the intended application and the completeness of the product information given herein with respect to such application. In no event shall Gostone or its affiliates be liable to any party for any direct, indirect, special, punitive, incidental or consequential damages of any nature whatsoever, including but not limited to loss of profits and loss of goodwill, whether or not such damages are based on tort or negligence, warranty, breach of contract or any other legal theory. In addition, any recipient of this document and the relevant products samples may not alter, decompile, disassemble, reverse engineer, or otherwise modify any information/samples received hereunder. Any intellectual property rights arising from the reverse engineering of Gostone's products shall belong to Gostone.