GOSTONE

RoHS COMPLIANT

N-Channel 200V,16mΩ max,SGT Power MOSFET

GMS160N20L3

Product Summary

V_{DS} (V)	$R_{DS(on),max}$ (mΩ)	I_D (A)
200	16 @ V_{GS} = 10V	81 (1)

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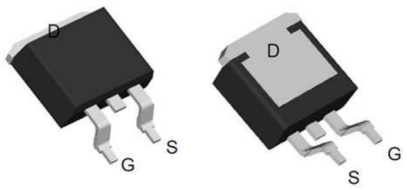
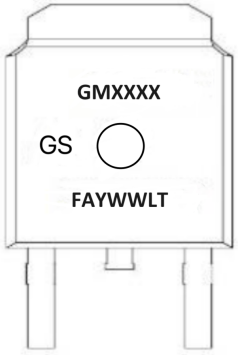


Features

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

Application

- DC/DC conversion
- Power switch
- Synchronous Rectification in SMPS



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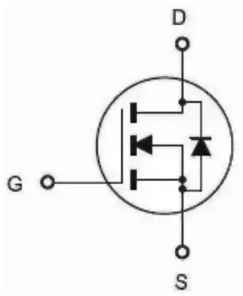
NOTE:
LOGO - GS
GMXXXXX- Part number code
F - Fab location code
A - Assembly location code
Y - Year code
WW - Week code
L&T - Assembly lot code

Equivalent circuit



Absolute maximum rating@25℃

Parameter		Symbol	Limit	Unit
Drain-source voltage		V_{DS}	200	V
Gate-source voltage		V_{GS}	±20	
Continuous drain current	T_C=25℃ (1)	I_D	81	A
	T_C=100℃		58	
Pulsed drain current(2)		$I_{D,pulse}$	326	
Avalanche energy, single pulse(3)		E_{AS}	922	mJ
Power dissipation	T_C=25℃	P_D	288	W
	T_A=25℃ (4)		144	
Operating junction and storage temperature range		T_J, T_{stg}	-55 to 150	℃

Thermal Characteristic

Parameter		Symbol	Max.	Unit
Thermal resistance, junction-to-case	Steady state	$R_{\theta JC}$	0.52	℃/W
Thermal resistance, junction-to-ambient (4)	Steady state	$R_{\theta JA}$	33	

Electrical Characteristics (TJ=25℃ unless otherwise noted)

Parameter	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Static parameter						
Drain to source breakdown voltage	$V_{(BR)DSS}$	V_{GS} = 0, I_D = 250 μA	200			V
Gate-source threshold voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 μA	2.5	3.4	4.5	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} = 100 V, V_{GS} = 0 V			1	μA
Drain-source on-resistance	$R_{DS(on)}$	V_{GS} = 10 V, I_D = 50 A		13.6	16	mΩ
Forward transconductance (5)	g_{fs}	V_{DS} = 5 V, I_D = 50 A		38		S
Gate resistance	R_g	f = 1 MHz		2.5		Ω
Dynamic (5)						
Total gate charge V_{GS}= 10 V	Q_g	V_{DS} = 100 V, I_D = 20 A, V_{GS} = 10 V		31		nC
Gate-source charge	Q_{gs}			9.8		
Gate-drain charge	Q_{gd}			7.7		
Turn-on delay time	$t_{d(on)}$	V_{DS} = 100 V, I_D = 20 A, V_{GS} = 10 V, R_{GEN} = 3 Ω		14		ns
Rise time	t_r			16		
Turn-off delay time	$t_{d(off)}$			28		
Fall time	t_f			12		
Input capacitance	C_{iss}	V_{DS} = 100 V, V_{GS} = 0 V, f = 1 MHz		2050		pF
Output capacitance	C_{oss}			297		
Reverse transfer capacitance	C_{rss}			11		
Reverse Diode Characteristics (5)						
Diode forward voltage	V_{SD}	V_{GS} = 0 V, I_F = 2 A		0.7	1.2	V
Reverse recovery time	t_{rr}	I_F = 20 A, di/dt = 100 A/μs		120		ns
Reverse recovery charge	Q_{rr}			524		nC

Notes

(1) Package limited.

(2) Pulse width limited by maximum junction temperature.

(3) V_{DS} = 100 V, V_{GS} = 10 V, L = 1.0 mH.

(4) Device mounted on FR-4 substrate PC board with 2oz copper in 1inch square cooling area.

(5) Guaranteed by design, not subject to production testing.

Typical Performance Characteristics

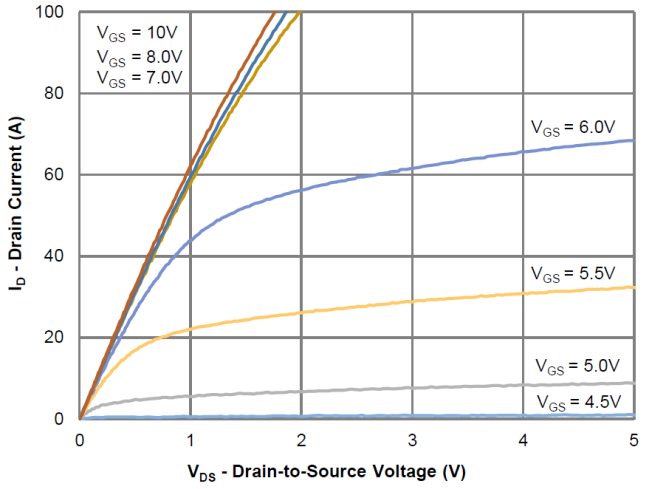


Figure 1: Output Characteristics

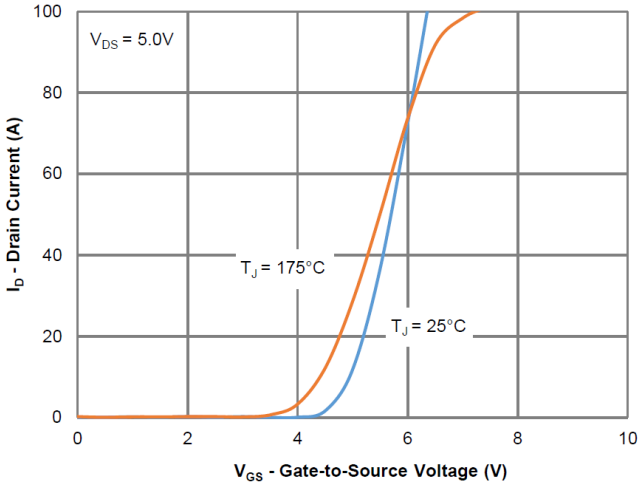


Figure 2: Transfer Characteristics

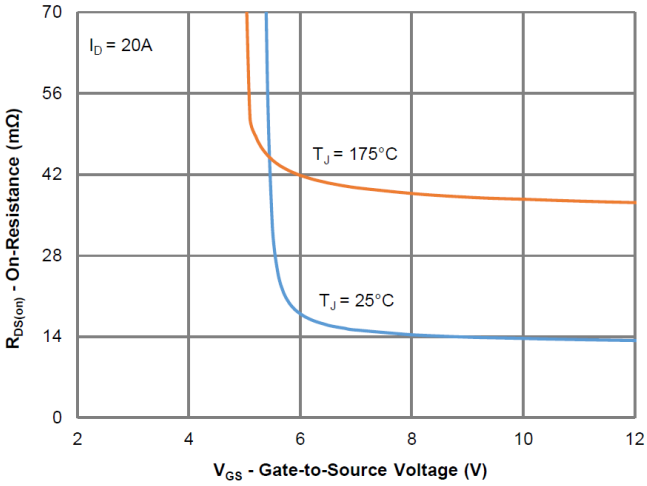


Figure 3: On-Resistance vs. Gate-Source Voltage

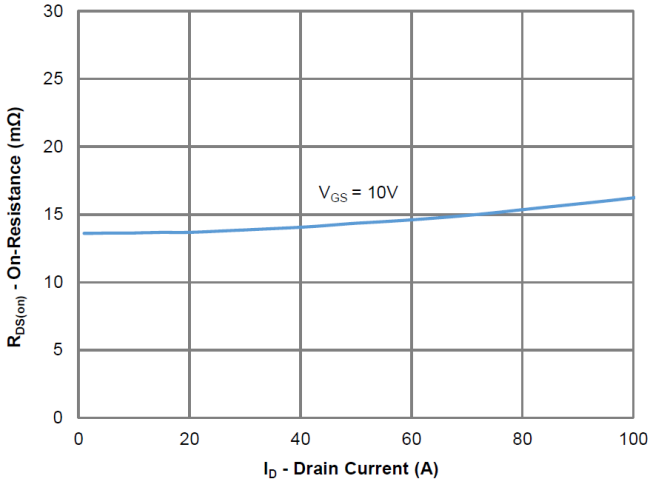


Figure 4: On-Resistance vs. Gate-Source Voltage

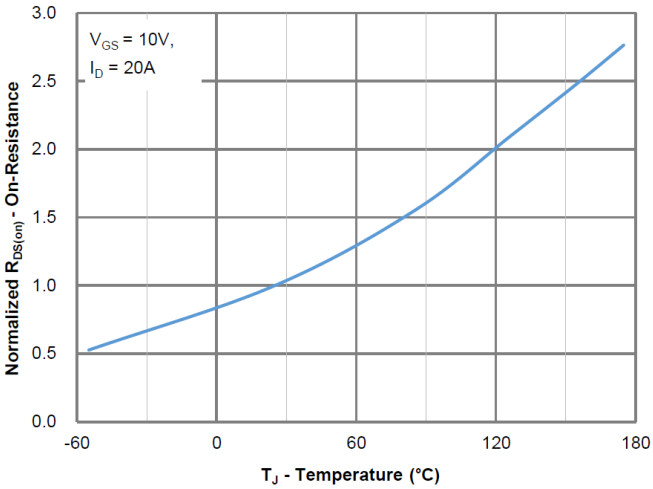


Figure 5: On-Resistance vs. Junction Temperature

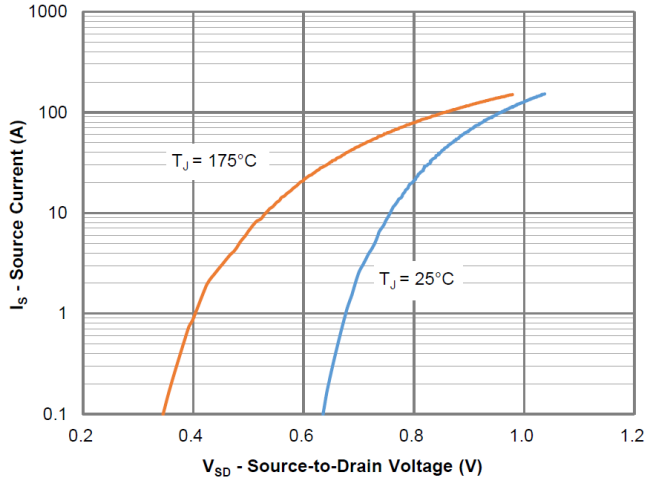


Figure 6: Source-Drain Diode Forward Voltage

Typical Performance Characteristics

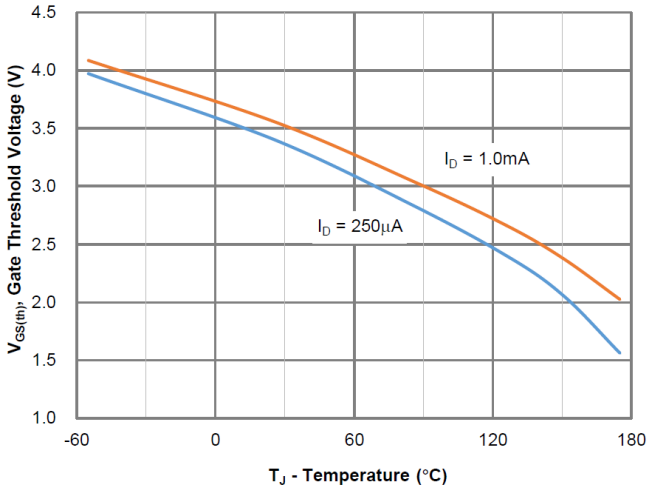


Figure 7: Gate Threshold Variation vs. Junction Temperature

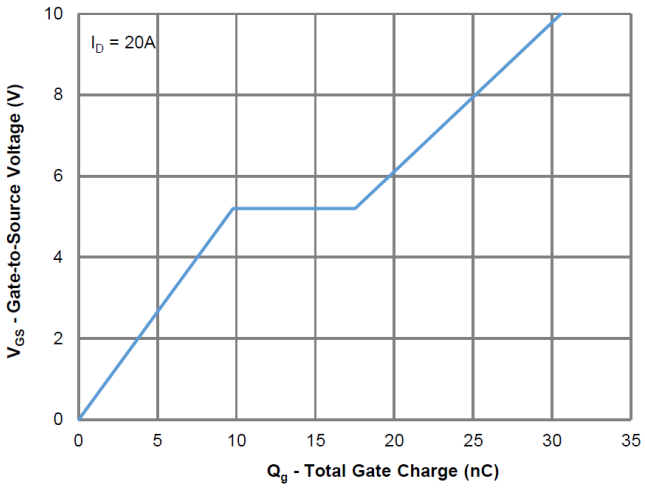


Figure 8: Gate Charge Characteristics

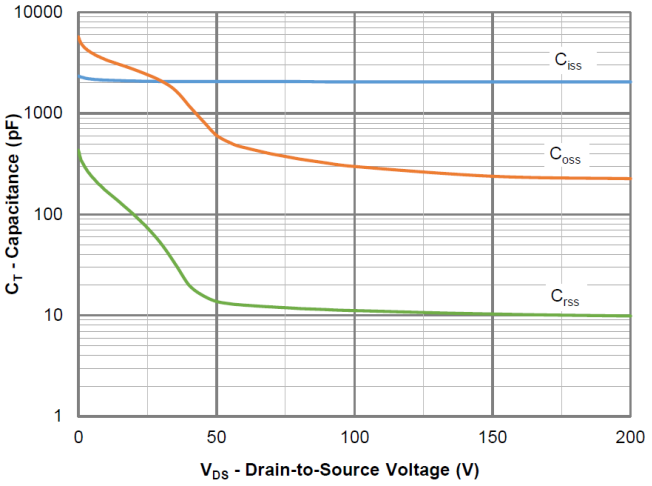


Figure 9: Capacitance Characteristics

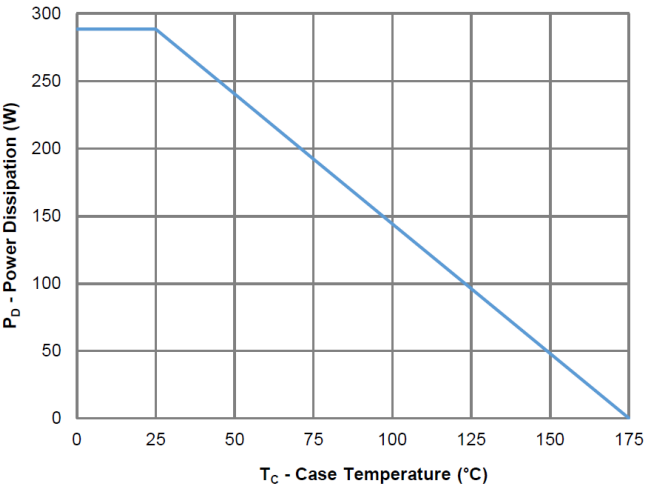


Figure 10: Power Derating

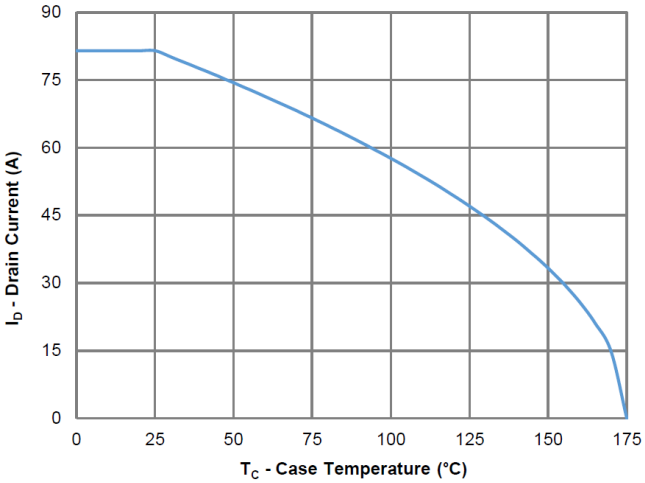


Figure 11: Current Derating

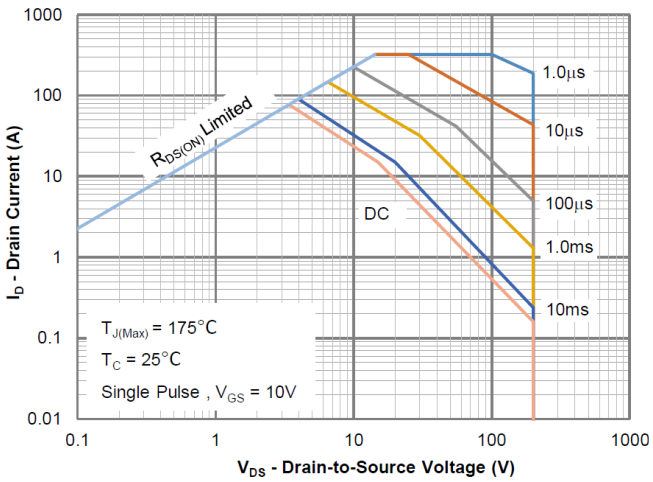


Figure 12: Safe Operating Area

Typical Performance Characteristics

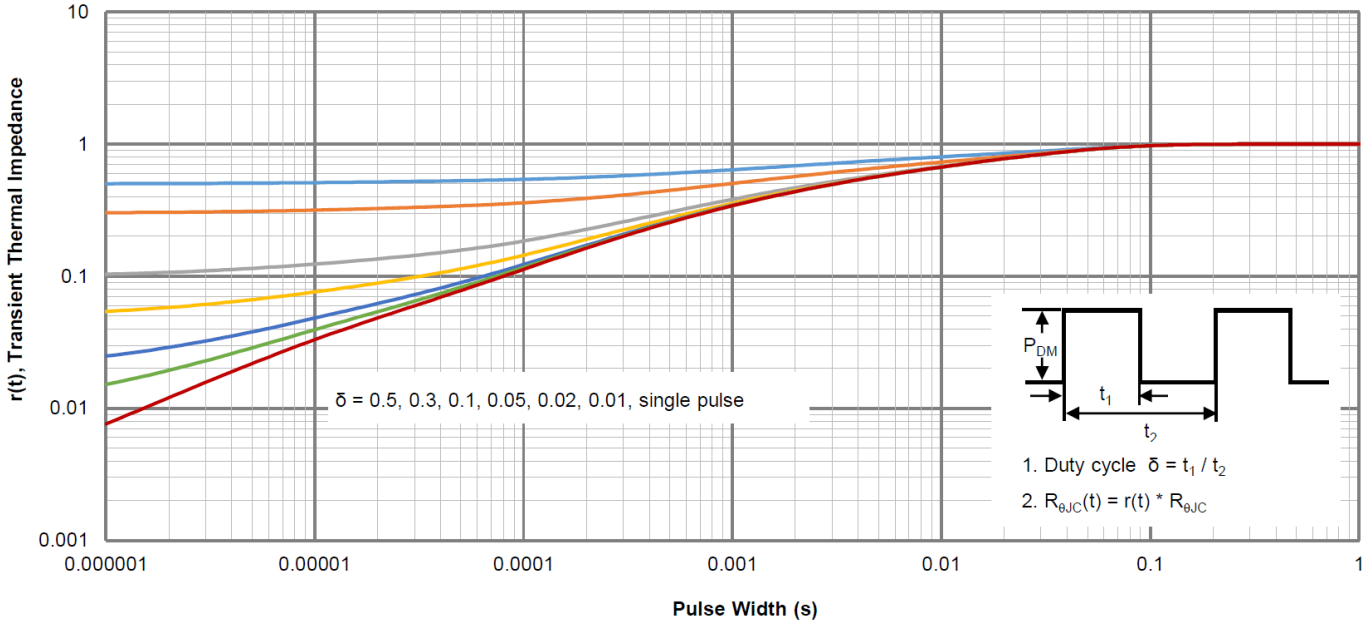
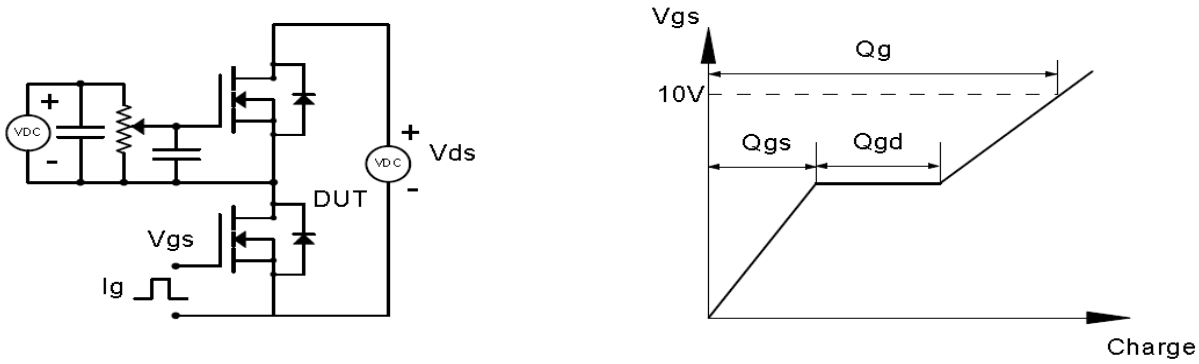


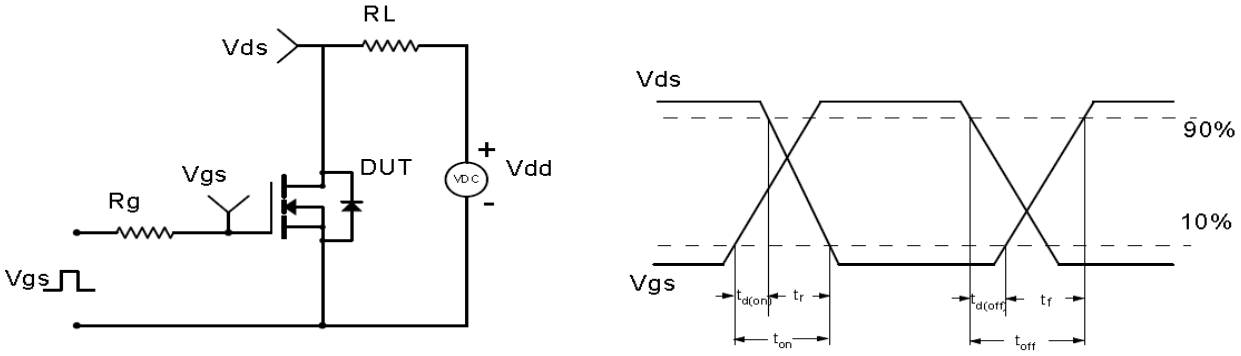
Figure 13: Normalized Maximum Transient Thermal Impedance

Test Circuit & Waveform

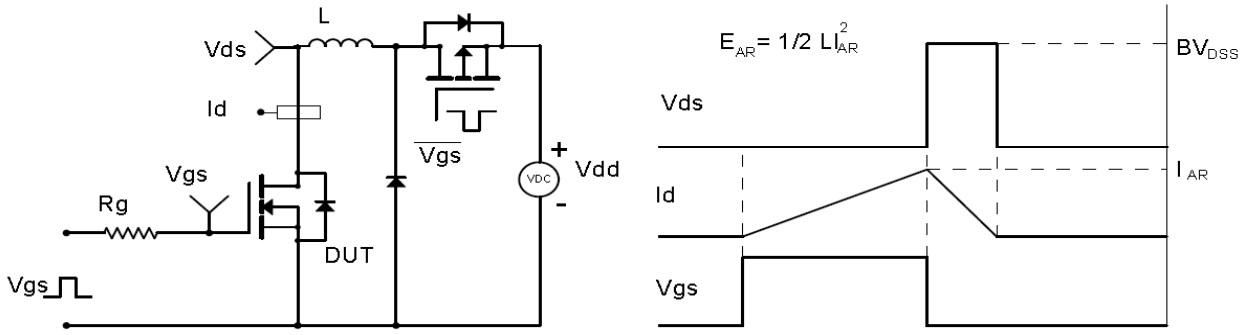
Gate Charge Test Circuit & Waveform



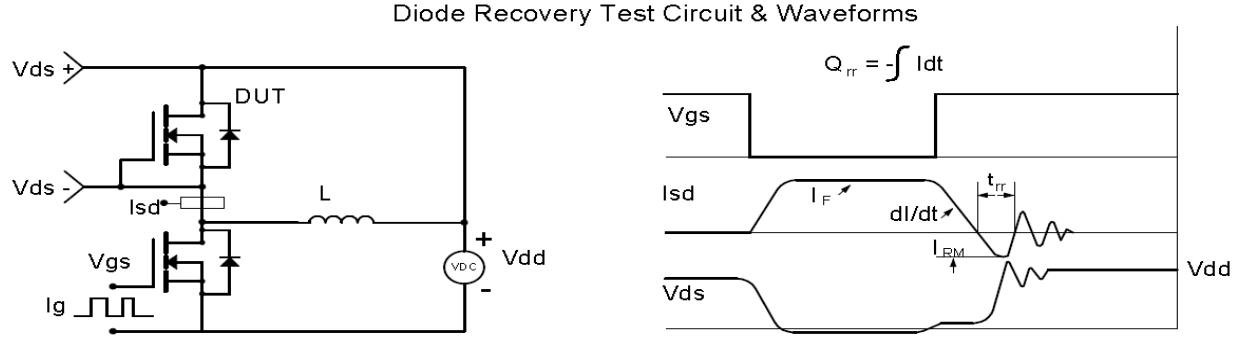
Resistive Switching Test Circuit & Waveforms



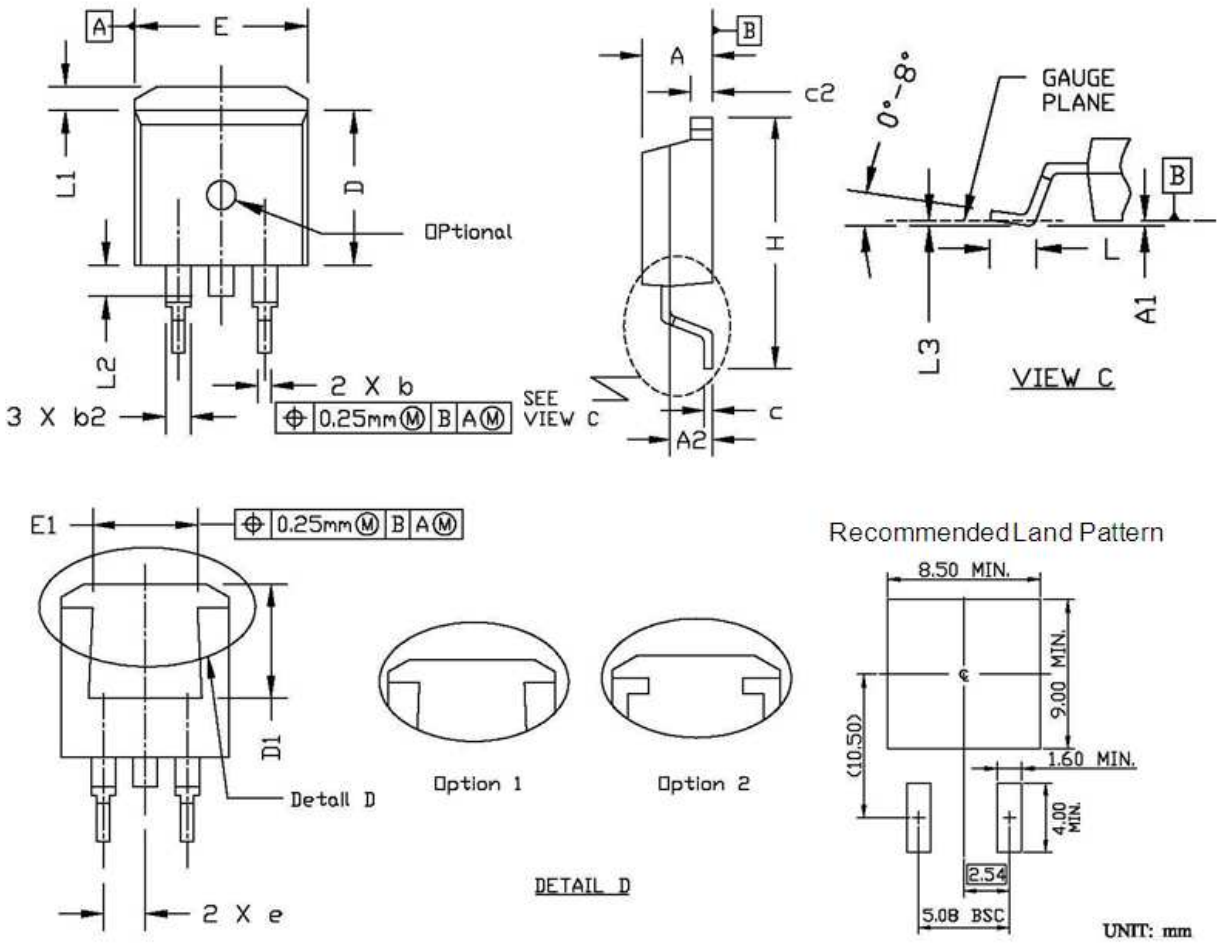
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Outline Drawing TO-263



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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