GOSTONE

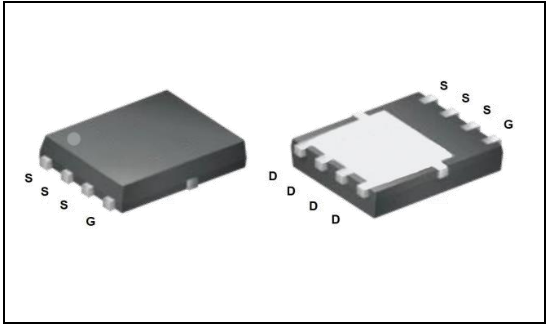
GMS039N10F1

N-Channel 100V,3.9mΩ max,SGT Power MOSFET

Product Summary

V_{DS} (V)	$R_{DS(on),max}$ (mΩ)	I_D (A)
100	3.9 @ V_{GS} = 10V	113 (1)

PDFN5060

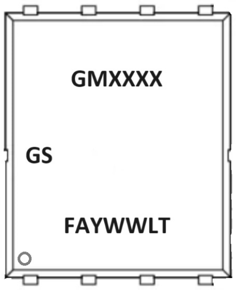


Features

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

Application

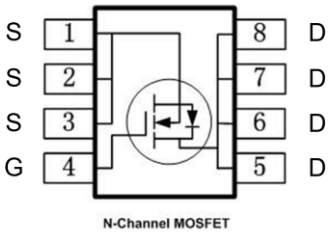
- DC/DC conversion
- Power switch
- Motor drives
- Synchronous Rectification in SMPS



PDFN5060

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}	100	V
Gate-source voltage		V_{GS}	±20	
Continuous drain current	T_C=25℃(1)	I_D	113	A
	T_C=100℃(1)		71	
Pulsed drain current(2)		$I_{D,pulse}$	450	
Avalanche energy, single pulse(3)		E_{AS}	578	mJ
Power dissipation	T_C=25℃	P_D	104	W
	T_A=100℃		42	
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	$R_{\theta JC}$	1.2	℃/W
Thermal resistance, junction-to-ambient (4)	Steady state	$R_{\theta JA}$	44	

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	100			V
Gate-source threshold voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 μA	2.0	3.0	4.0	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 = 20 A		3.5	3.9	mΩ
Forward transconductance (5)	g_{fs}	V_{DS} = 5 V, I_D = 30 A		48		S
Gate resistance	R_g	f = 1 MHz		1.6		Ω
Dynamic(5)						
Total gate charge V_{GS} = 10V	Q_g	V_{DS} = 50 V, I_D = 20 A, V_{GS} = 10 V		44		nC
Total gate charge V_{GS} = 6.0V	Q_g			28		
Gate-source charge	Q_{gs}			9.3		
Gate-drain charge	Q_{gd}			8.4		
Turn-on delay time	$t_{d(on)}$	V_{DS} = 50 V, I_D = 20 A, V_{GS} = 10 V, R_{GEN} = 3 Ω		9.2		ns
Rise time	t_r			15		
Turn-off delay time	$t_{d(off)}$			29		
Fall time	t_f			19		
Input capacitance	C_{iss}	V_{DS} = 50 V, V_{GS} = 0 V, f = 1 MHz		3056		pF
Output capacitance	C_{oss}			1379		
Reverse transfer capacitance	C_{rss}			19		
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		65		ns
Reverse recovery charge	Q_{rr}			138		nC

Notes

(1) Limited by maximum junction temperature.

(2) Pulse width limited by maximum junction temperature.

(3) V_{DS} = 50 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

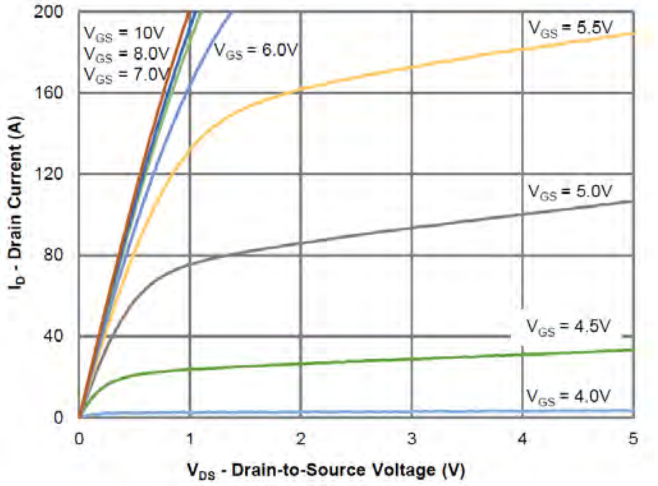


Figure 1: Output Characteristics

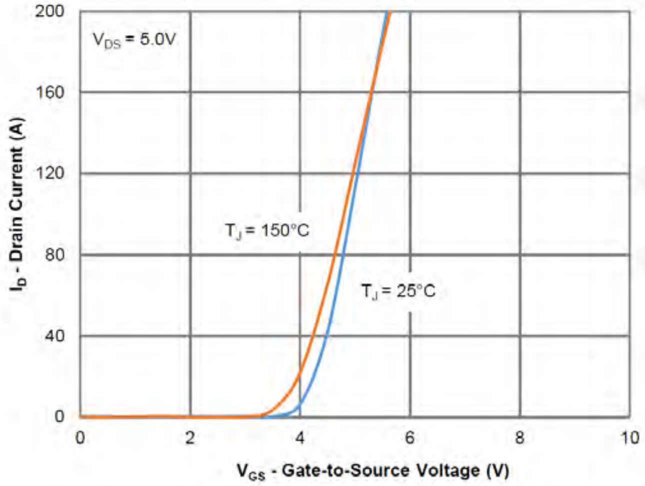


Figure 2: Transfer Characteristics

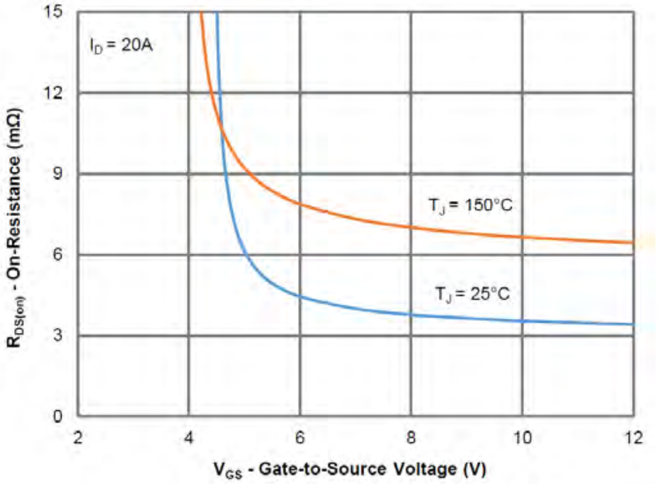


Figure 3: On-Resistance vs. Gate-Source Voltage

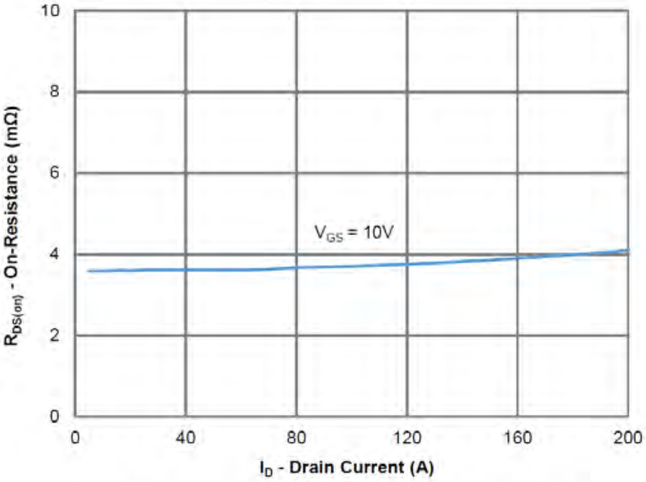


Figure 4: On-Resistance vs. Gate-Source Voltage

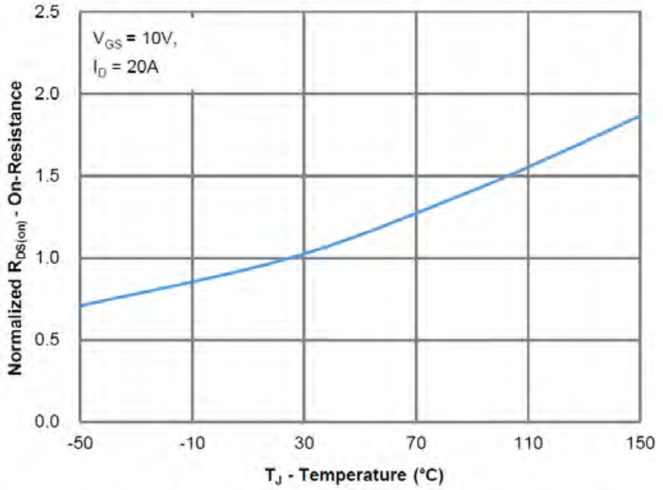


Figure 5: On-Resistance vs. Junction Temperature

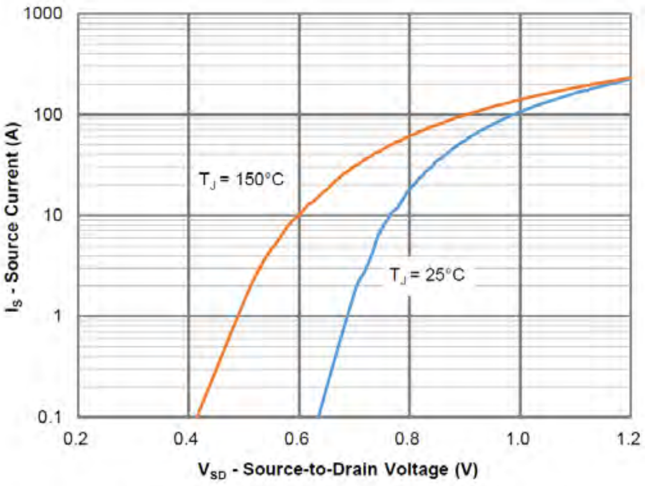


Figure 6: Source-Drain Diode Forward Voltage

Typical Performance Characteristics

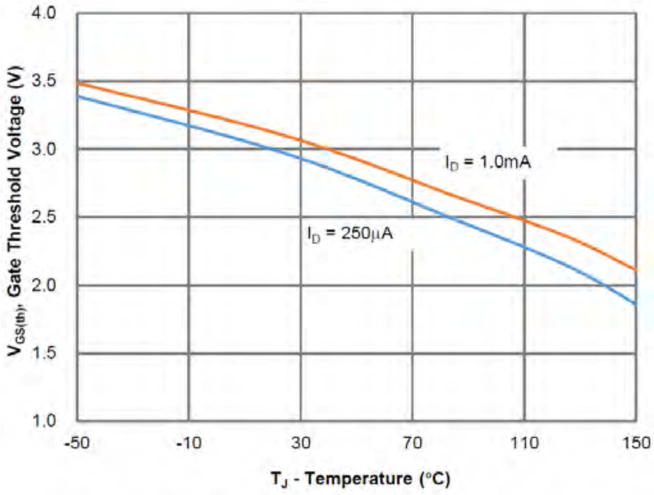


Figure 7: Gate Threshold Variation vs. Junction Temperature

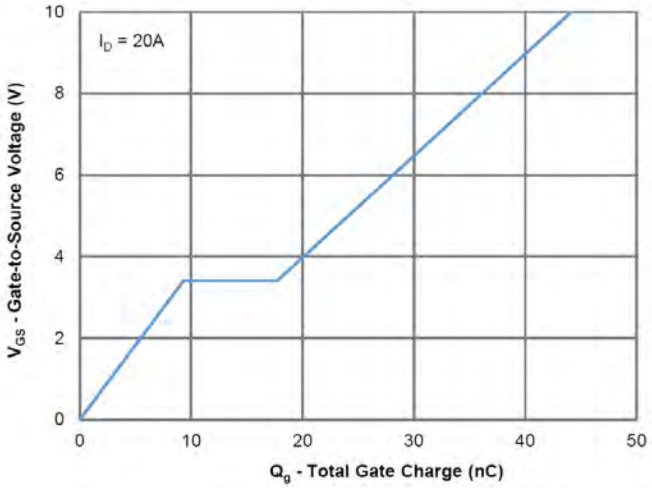


Figure 8: Gate Charge Characteristics

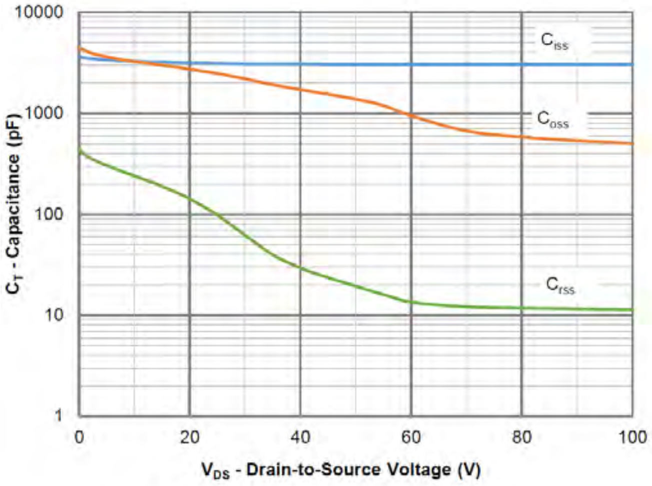


Figure 9: Capacitance Characteristics

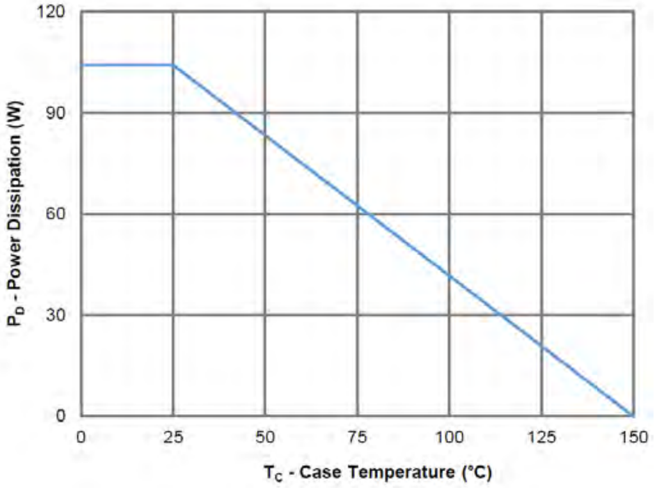


Figure 10: Power Derating

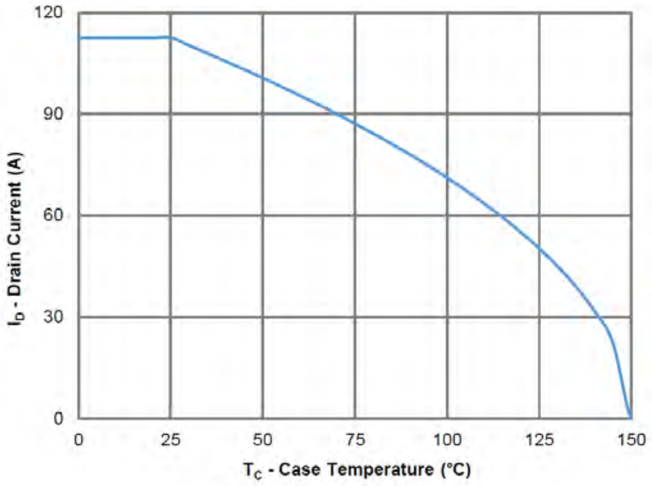


Figure 11: Current Derating

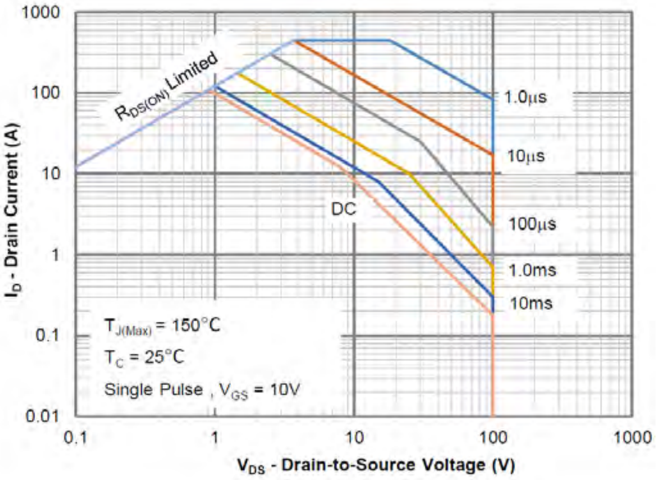


Figure 12: Safe Operating Area

Typical Performance Characteristics

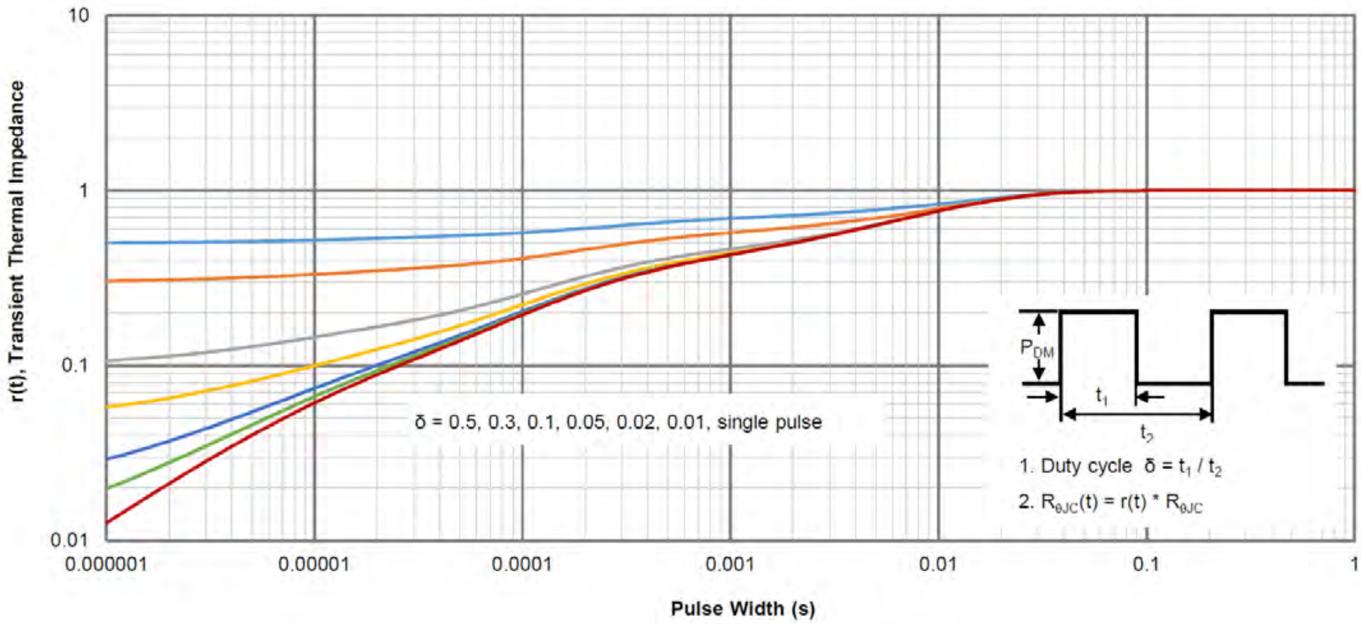
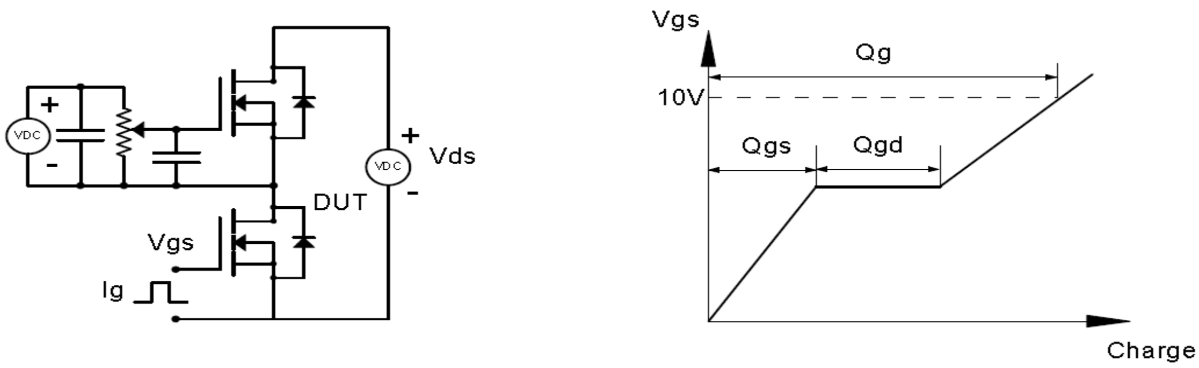


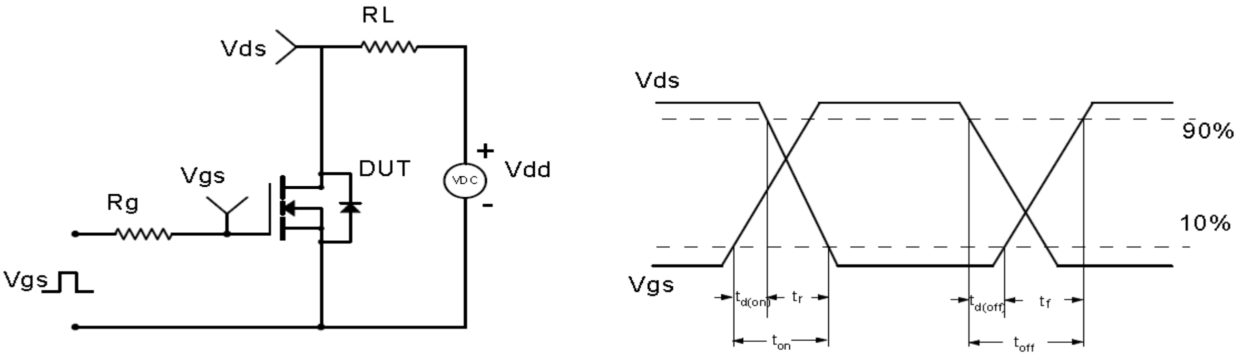
Figure 13: Normalized Maximum Transient Thermal Impedance

Test Circuit & Waveform

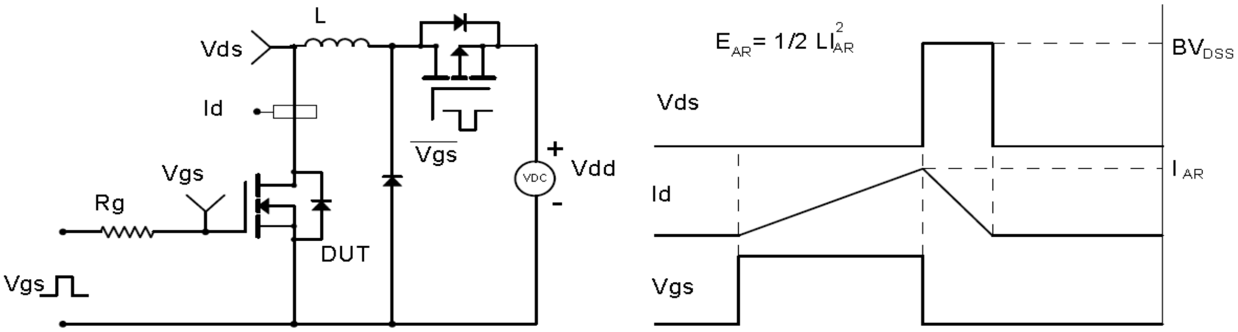
Gate Charge Test Circuit & Waveform



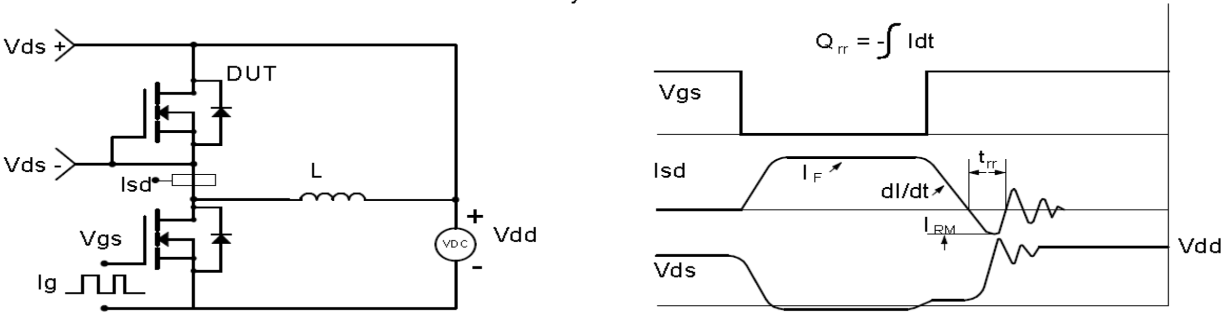
Resistive Switching Test Circuit & Waveforms



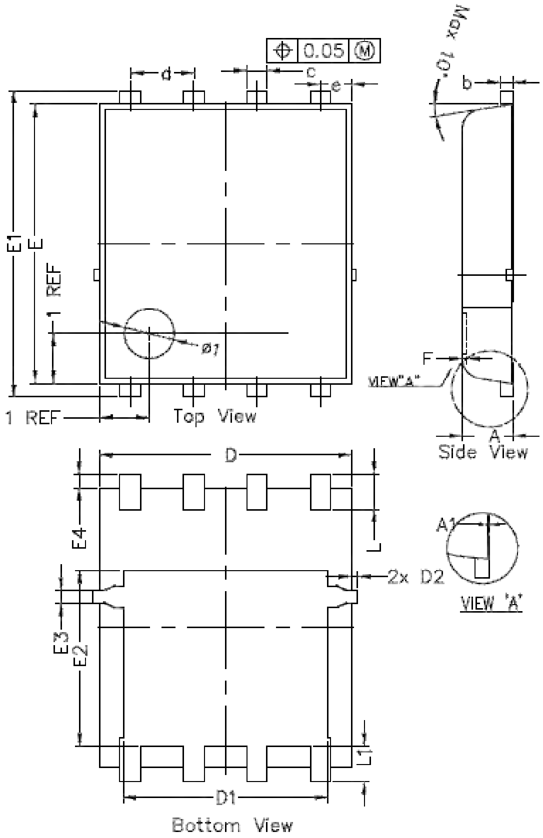
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Outline Drawing PDFN5060



Dim	Millimeters		
	Min	Nom	Max
A	0.900	1.000	1.100
A1	0.000	---	0.050
b	0.246	0.254	0.312
c	0.310	0.410	0.510
d	1.27BSC		
D	4.950	5.050	5.150
D1	4.000	4.100	4.200
D2	---	---	0.125
e	0.62BSC		
E	5.500	5.600	5.700
E1	6.050	6.150	6.250
E2	3.425	3.525	3.625
E3	0.150	0.250	0.350
E4	0.175	0.275	0.375
F	---	---	0.100
L	0.500	0.600	0.700
L1	0.600	0.700	0.800

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