GOSTONE

RoHS COMPLIANT

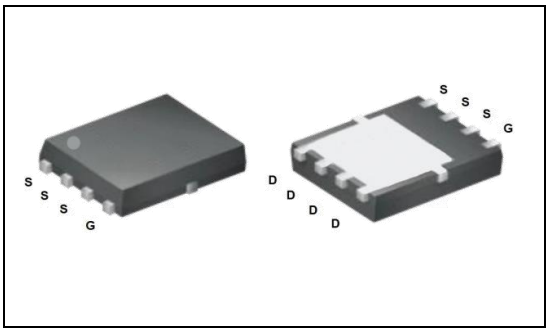
N-Channel 30V,1.7mΩ max, Power MOSFET

GMS018N03F1

Product Summary

V_{DS} (V)	$R_{DS(on),max}$ (mΩ)	I_D (A)
30	1.7 @ V_{GS} = 10V	180 (1)

PDFN5060

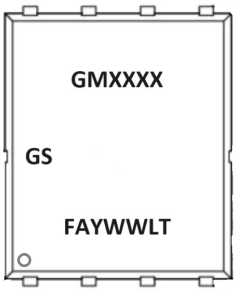


Features

- Low RDS(on) trench technology
- Low thermal impedance
- Fast switching speed
- 100% avalanche tested

Application

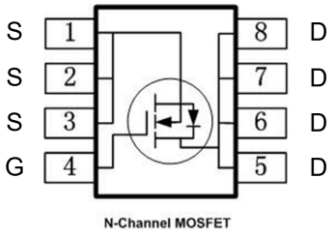
- Power management
- SMPS and general purpose applications
- Uninterruptible Power Supply
- Load Switch



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℃

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Continuous Drain Current, V_{GS} @ 10V[1]	180	A
I_D@T_C=100℃	Continuous Drain Current, V_{GS} @ 10V[1]	114	A
I_{DM}	Pulsed Drain Current[2]	720	A
E_{AS}	Single Pulse Avalanche Energy[3]	270	mJ
I_{AS}	Single Pulse Avalanche Current (L=0.3mH)	28	A
P_D@T_C=25℃	Total Power Dissipation[4]	78	W
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃

Thermal Characteristic

Parameter		Symbol	Max.	Unit
Thermal resistance, junction-to-case	Steady state	$R_{\theta JC}$	1.6	℃/W
Thermal resistance, junction-to-ambient	Steady state	$R_{\theta JA}$	46	

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	30			V
Gate-source threshold voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 μA	1.2	1.6	2.4	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} = 30 V, V_{GS} = 0 V			1	μA
Drain-source on-resistance	$R_{DS(on)}$	V_{GS} = 10 V, I_D = 30 A		1.28	1.7	mΩ
	$R_{DS(on)}$	V_{GS} = 4.5 V, I_D = 30 A		1.95	2.5	mΩ
Forward transconductance (5)	g_{fs}	V_{DS} = 5 V, I_D = 30 A		41		S
Gate resistance	R_g	f = 1 MHz		2.1		Ω
Dynamic(5)						
Total gate charge V_{GS} = 10V	Q_g	V_{DS} = 15 V, I_D = 20 A, V_{GS} = 10 V		38		nC
Gate-source charge	Q_{gs}			7.3		
Gate-drain charge	Q_{gd}			7.5		
Turn-on delay time	$t_{d(on)}$	V_{DS} = 15 V, I_D = 20A , V_{GS} = 10 V, R_{GEN} = 3.0 Ω		5.3		ns
Rise time	t_r			10		
Turn-off delay time	$t_{d(off)}$			28		
Fall time	t_f			11		
Input capacitance	C_{iss}	V_{DS} = 15 V, V_{GS} = 0 V, f = 1M Hz		2510		pF
Output capacitance	C_{oss}			1720		
Reverse transfer capacitance	C_{rss}			142		

Diode Characteristics(5)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Reverse Recovery Time	Trr	I_F=20A, V_{GS}=0V di/dt=100A/μs	---	42		ns
Reverse Recovery Charge	Qrr		---	37		nC
Forward on voltage	V_{SD}	V_{GS}=0V , I_S=2.0A , T_J=25°C	---	0.7	1.2	V

Notes

1.The data tested by surface mounted on a 1 inch^2 FR-4 board with 2OZ copper, t<10sec.

2.The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%

3.The EAS data shows Max. rating . The test condition is V_{DD}=15V,V_{GS}=10V,L=1.0mH

4.The power dissipation is limited by 150°C junction temperature

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

Typical Performance Characteristics

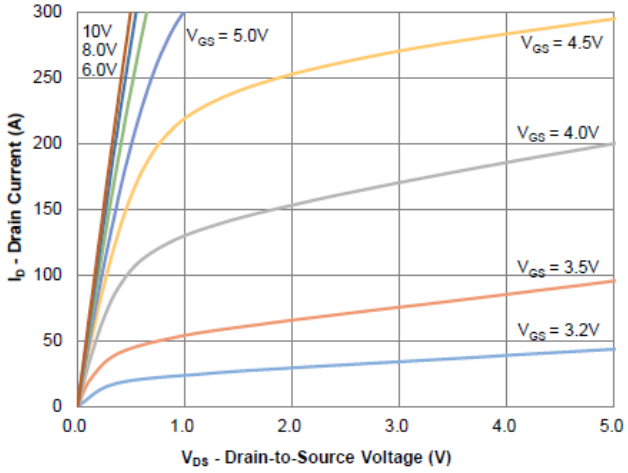


Figure 1: Output Characteristics

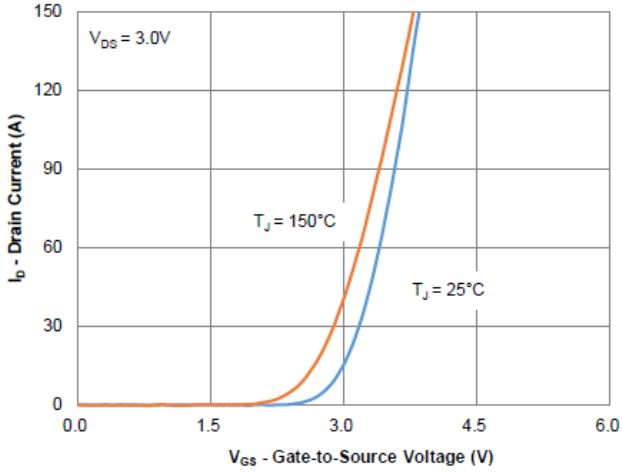


Figure 2: Transfer Characteristics

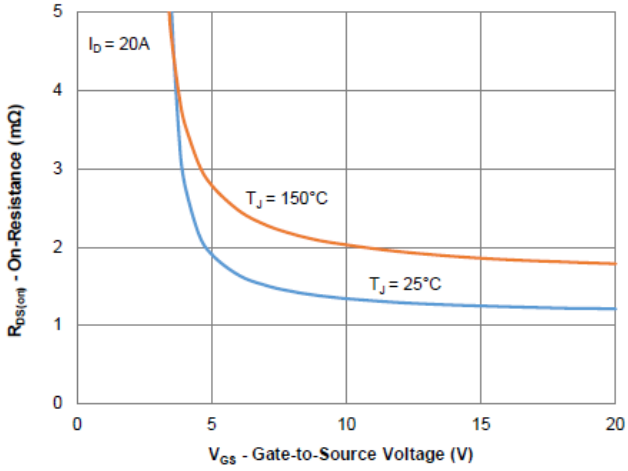


Figure 3: On-Resistance vs. Gate-Source Voltage

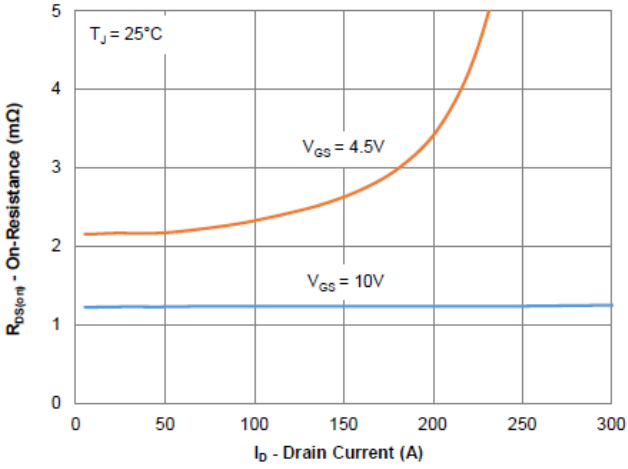


Figure 4: On-Resistance vs. Gate-Source Voltage

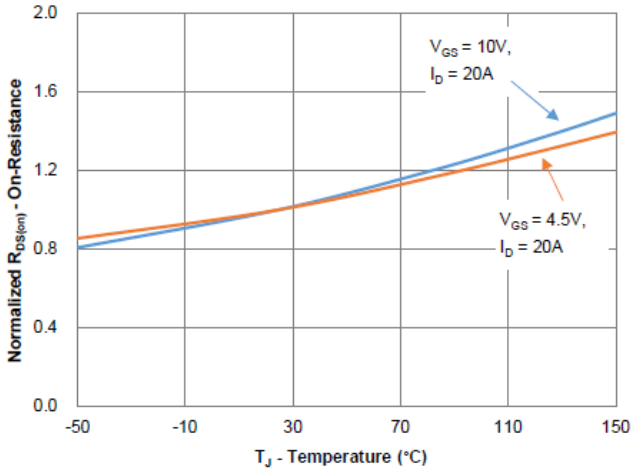


Figure 5: On-Resistance vs. Junction Temperature

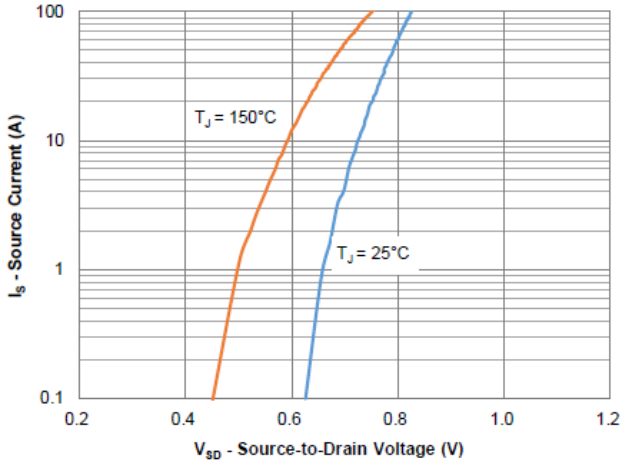


Figure 6: Source-Drain Diode Forward Voltage

Typical Performance Characteristics

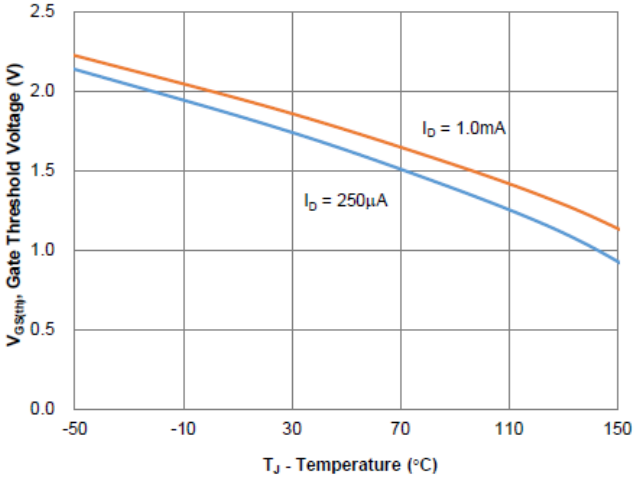


Figure 7: Gate Threshold Variation vs. Junction Temperature

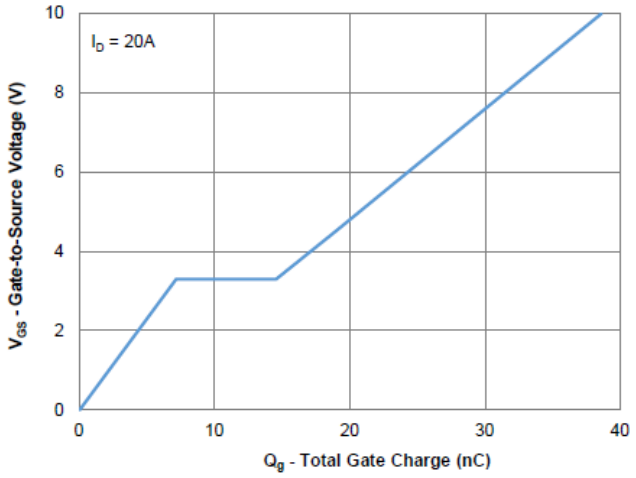


Figure 8: Gate Charge Characteristics

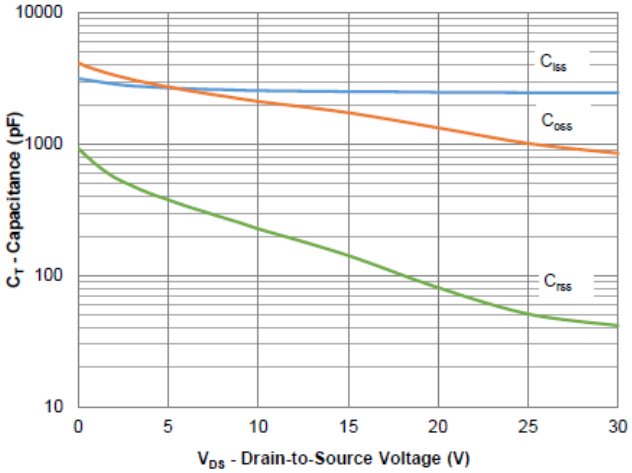


Figure 9: Capacitance Characteristics

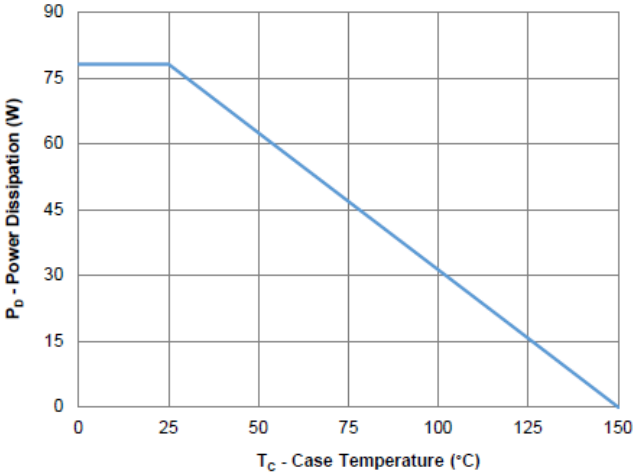


Figure 10: Power Derating

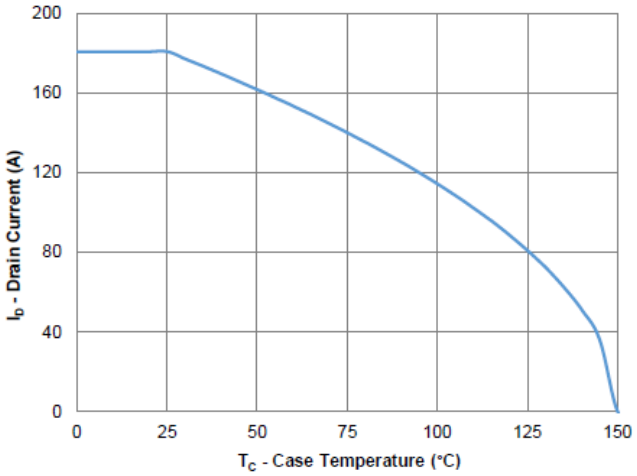


Figure 11: Current Derating

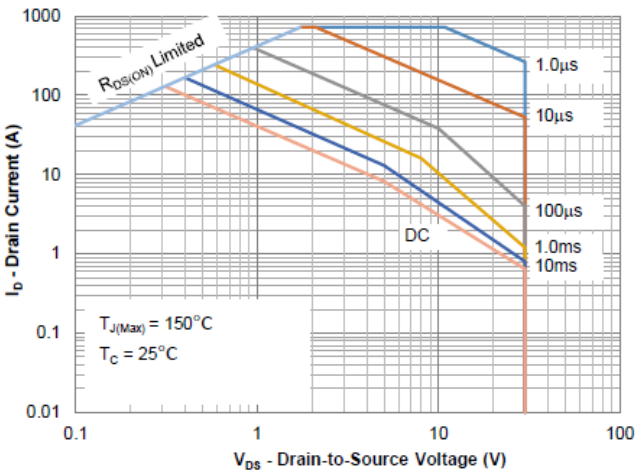


Figure 12: Safe Operating Area

Typical Performance Characteristics

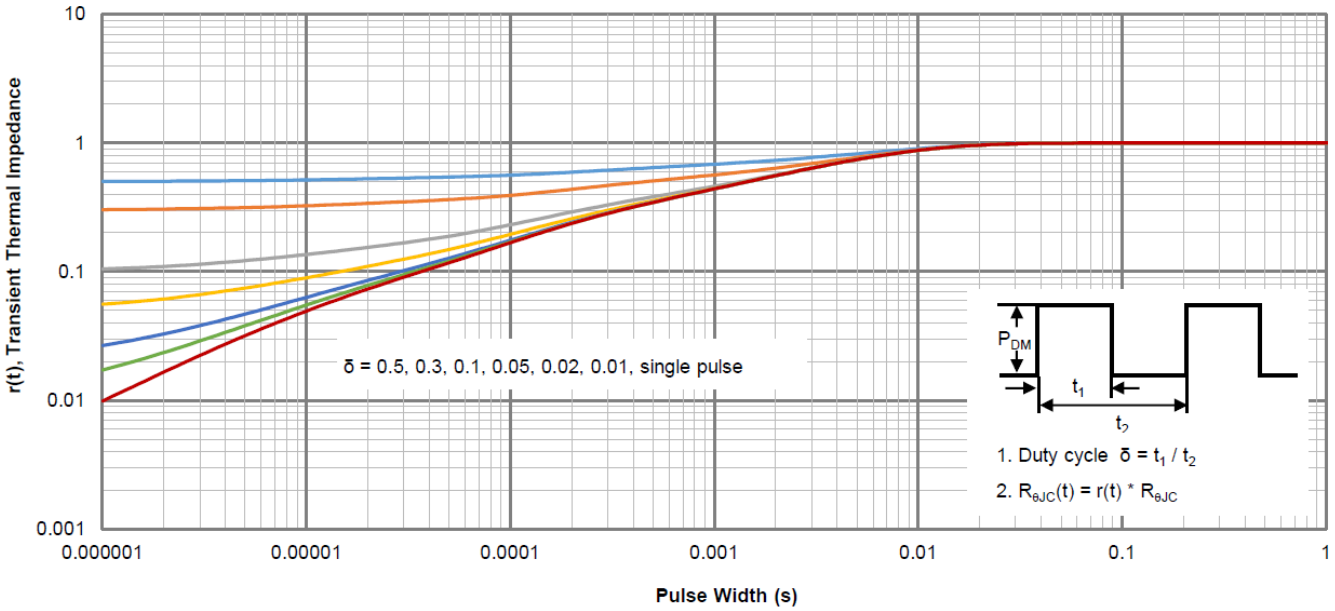
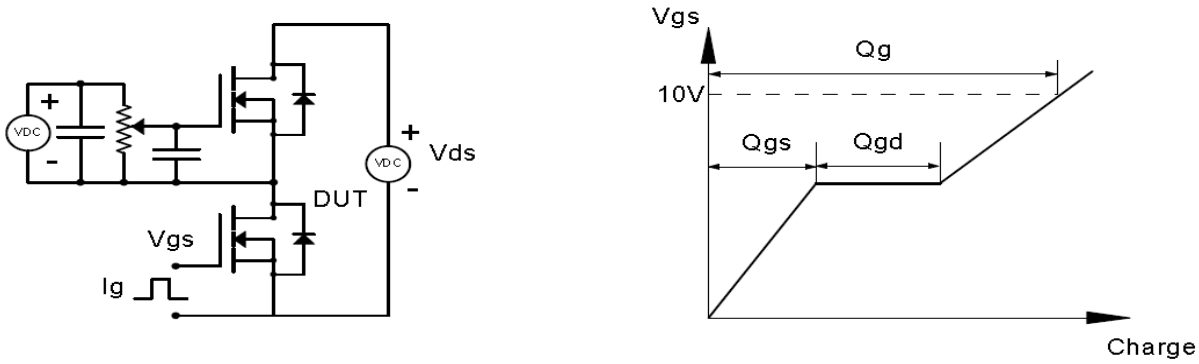


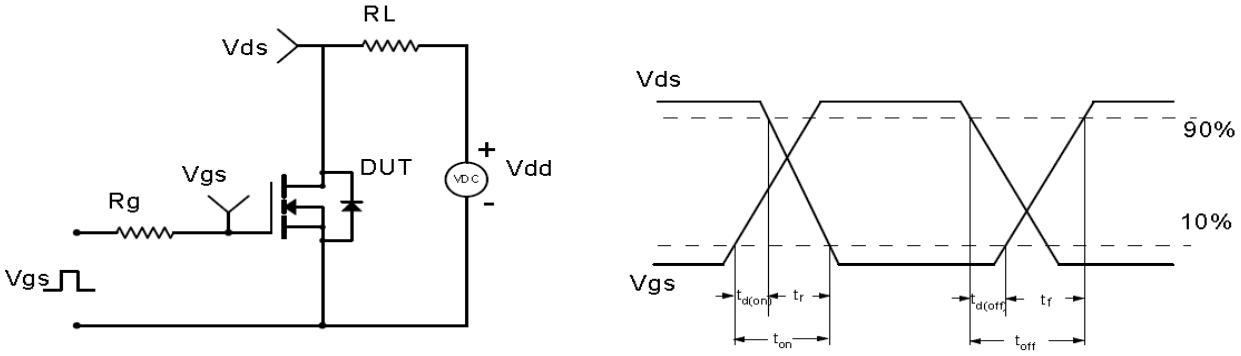
Figure 13: Normalized Maximum Transient Thermal Impedance

Test Circuit & Waveform

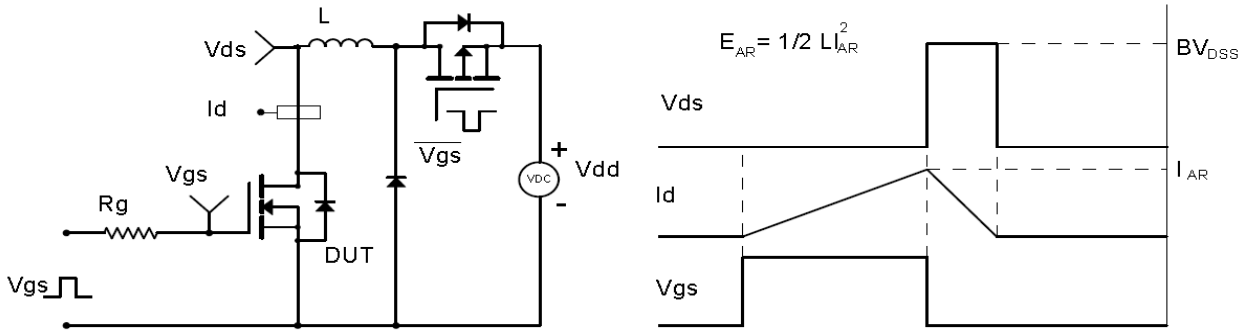
Gate Charge Test Circuit & Waveform



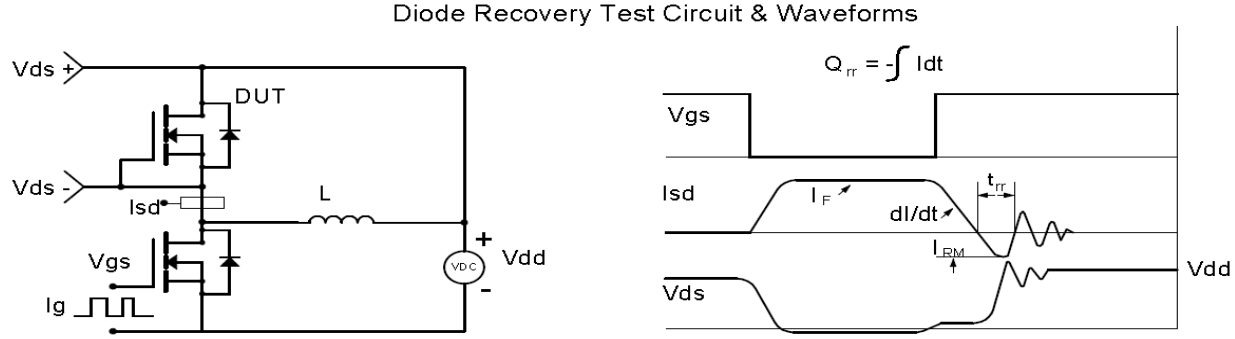
Resistive Switching Test Circuit & Waveforms



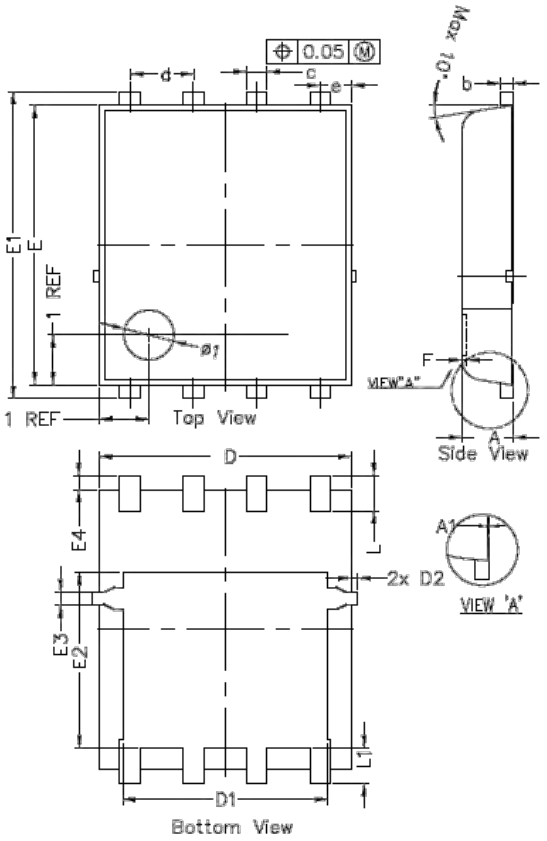
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



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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