

Product Summary

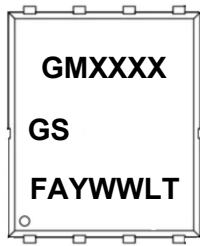
V_{DS} (V)	$R_{DS(on),max}$ (mΩ)	I_D (A)
150	11.5 @ $V_{GS} = 10V$	71 ⁽¹⁾

Features

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

Application

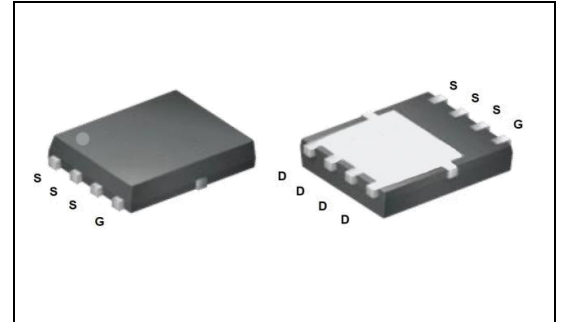
- Primary side switch
- Synchronous rectification
- DC/DC conversion
- Hard Switching and High Speed Circuit



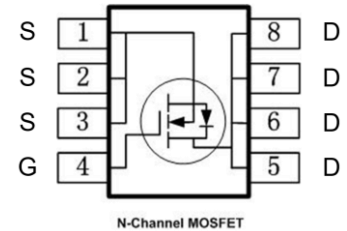
PDFN5060

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

PDFN5060



Equivalent circuit



Absolute maximum rating@25°C

PARAMETER	SYMBOL	LIM	UNIT
Drain-Source Voltage	V_{DS}	150	V
Gate-Source Voltage	V_{GS}	±20	
Continuous Drain Current	$T_C = 25\text{ °C}$	71	A
	$T_C = 100\text{ °C}$	50	
Pulsed Drain Current ($t = 300\text{ }\mu\text{s}$)	I_{DM}	285	A
Single Pulse Avalanche Energy	$L = 1.0\text{ mH}$	E_{AS}	516
Maximum Power Dissipation	$T_C = 25\text{ °C}$	P_D	125
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 to 150	°C
Soldering Recommendations (Peak Temperature) ^{c,d}		260	

Thermal Characteristic

PARAMETER	SYMBOL	TYPICAL	MAXIMUM	UNIT
Maximum Junction-to-Ambient	R_{thJA}	35	43	°C/W
Maximum Junction-to-Case	R_{thJC}	0.8	1.0	

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

PARAMETER	S MBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Static						
Drain-Source Breakdown Voltage	V _{DS}	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	2.4	3.3	4.4	V
Gate-Source 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
		V _{DS} = 150 V, V _{GS} = 0 V, T _J = 55 °C			10	
Drain-Source On-State Resistance ^a	R _{DS(on)}	V _{GS} = 10 V, I _D = 10 A		9.7	12	mΩ
Forward Transconductance ^a	g _{fs}	V _{DS} = 5 V, I _D = 20 A		55		S
Dynamic ^b						
Input Capacitance	C _{iSS}	V _{DS} = 75 V, V _{GS} = 0 V, f = 1 MHz		1229		pF
Output Capacitance	C _{oSS}			320		
Reverse Transfer Capacitance	C _{rSS}			12		
Total Gate Charge	Q _g	V _{DS} = 75 V, V _{GS} = 10 V, I _D = 10 A		19		nC
Gate-Source Charge	Q _{gs}			5.9		
Gate-Drain Charge	Q _{gd}			4.4		
Gate Resistance	R _g	f = 1 MHz		3.4		Ω
Turn-On Delay Time	t _{d(on)}	V _{DS} = 75 V, V _{GS} = 10 V, I _D = 20 A, R _{GEN} =3.0Ω		6.1		ns
Rise Time	t _r			12		
Turn-Off Delay Time	t _{d(off)}			16		
Fall Time	t _f			16		
Drain-Source Body Diode Characteristics						
Body Diode Voltage	V _{SD}	I _S = 4 A, V _{GS} = 0 V		0.7	1.2	V
Body Diode Reverse Recovery Time	t _{rr}	I _F = 20 A, dI/dt = 100 A/μs, T _J = 25 °C		98		ns
Body Diode Reverse Recovery Charge	Q _{rr}			295		nC

Notes

- a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2 %.
- b. Guaranteed by design, not subject to production testing.

Typical Performance Characteristics

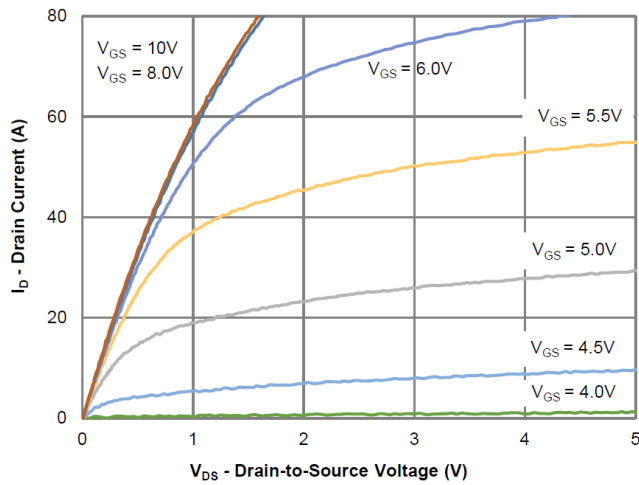


Figure 1: Output Characteristics

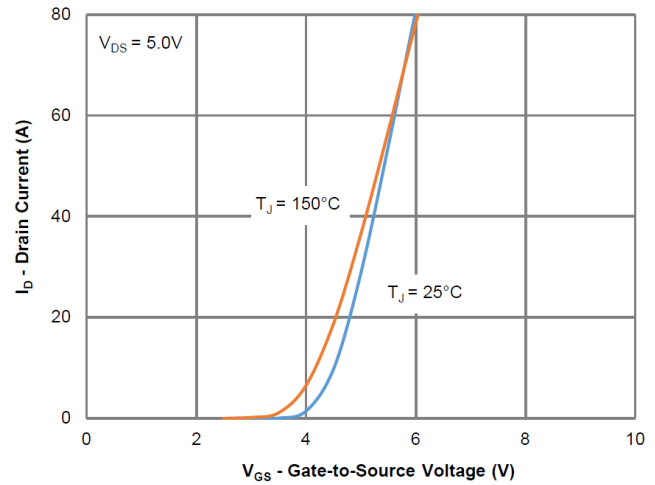


Figure 2: Transfer Characteristics

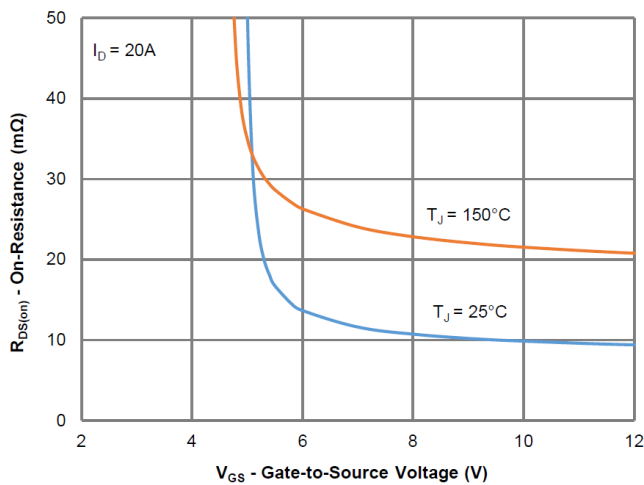


Figure 3: On-Resistance vs. Gate-Source Voltage

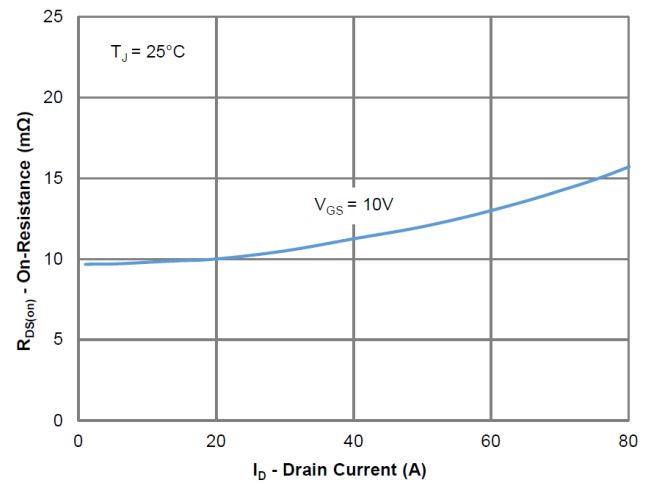


Figure 4: On-Resistance vs. Drain Current and Gate Voltage

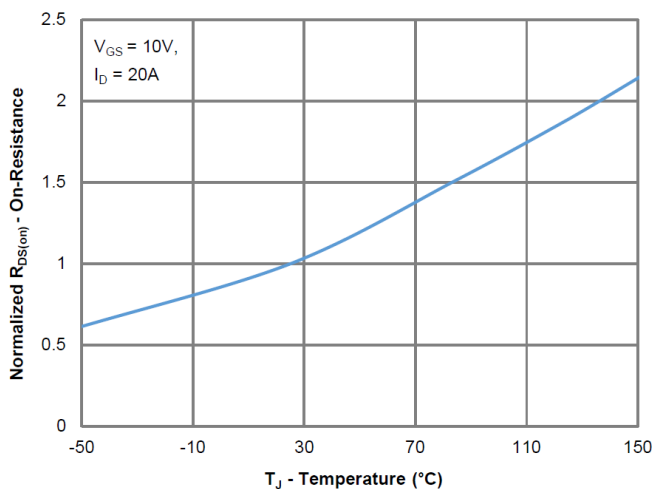


Figure 5: On-Resistance vs. Junction Temperature

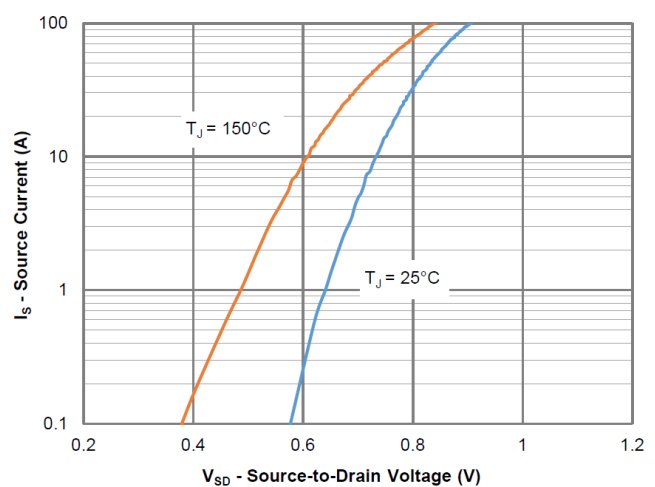


Figure 6: Source-Drain Diode Forward Voltage

Typical Performance Characteristics

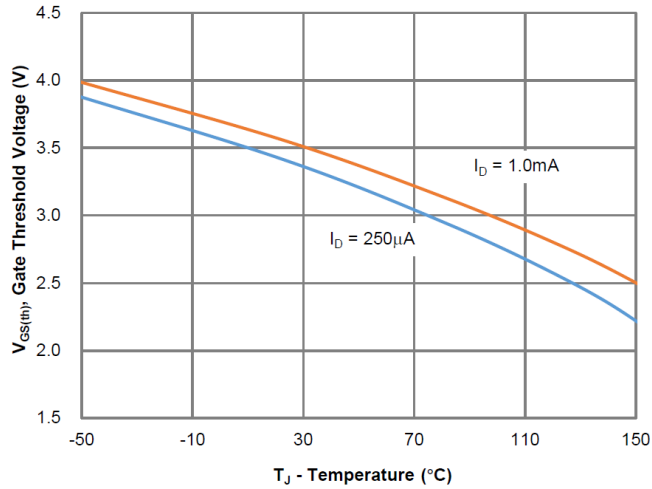


Figure 7: Gate Threshold Variation vs. Junction Temperature

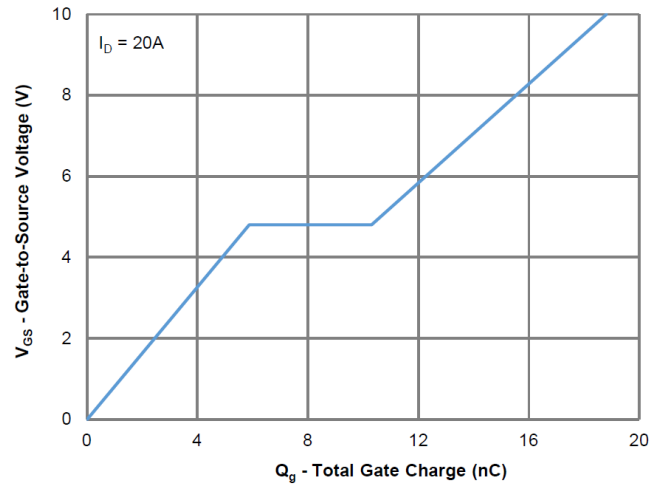


Figure 8: Gate Charge Characteristics

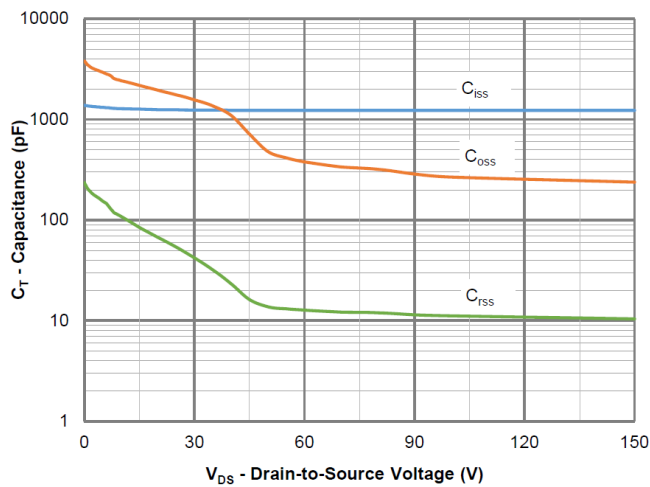


Figure 9: Capacitance Characteristics

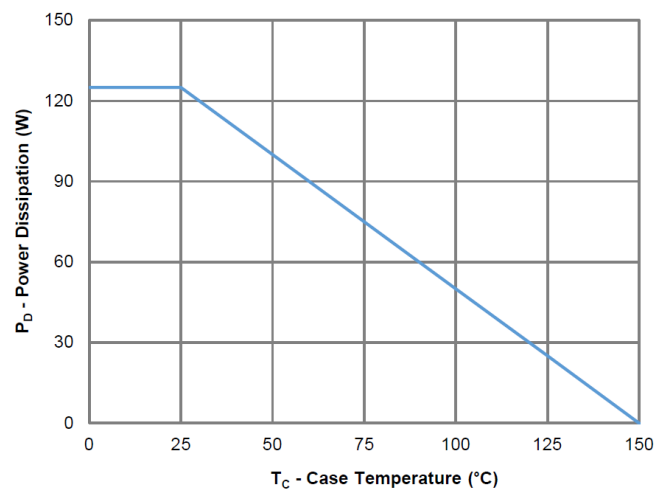


Figure 10: Power Derating

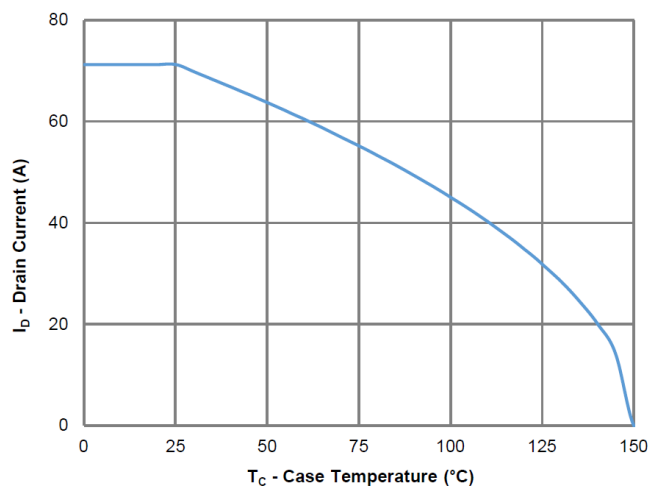


Figure 11: Current Derating

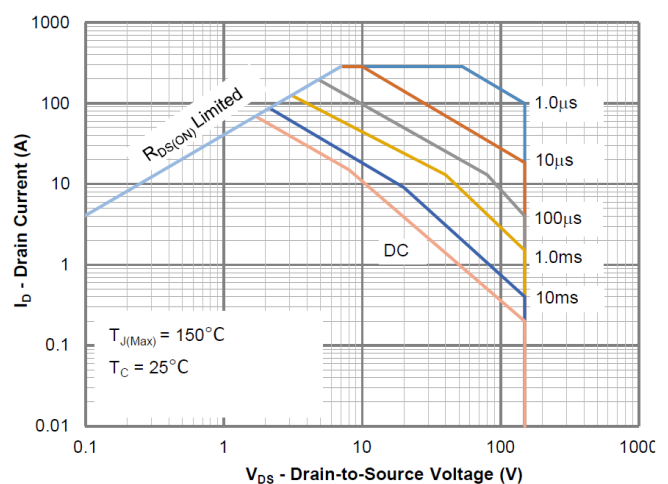


Figure 12: Safe Operating Area



Typical Performance Characteristics

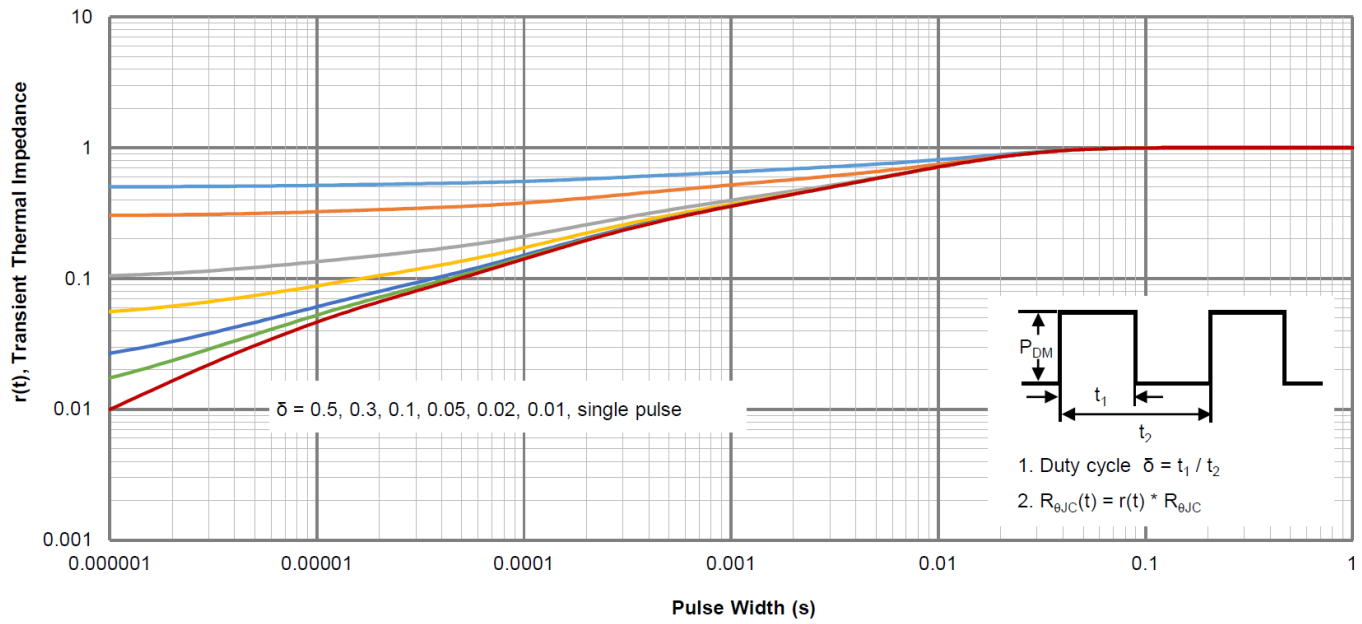
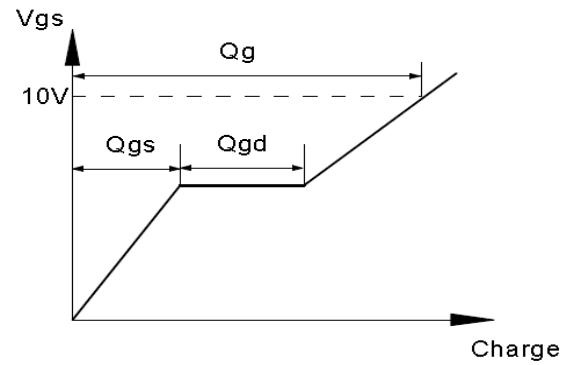
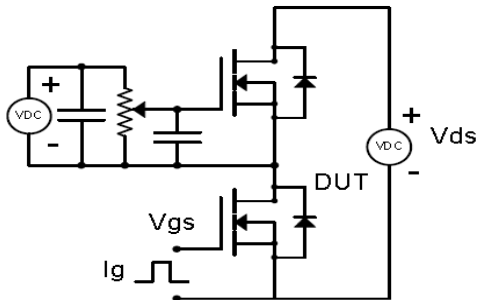


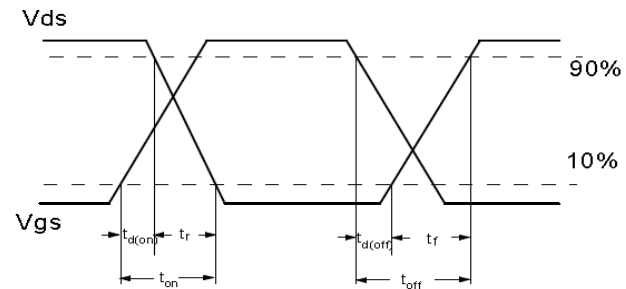
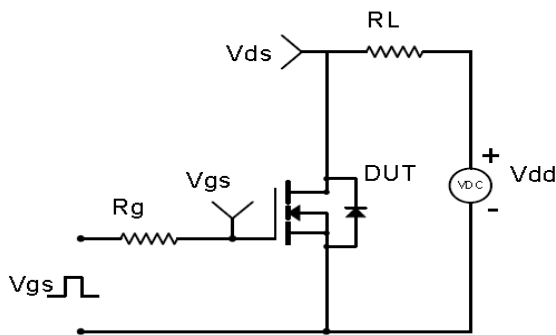
Figure 13: Normalized Maximum Transient Thermal Impedance

Test Circuit & Waveform

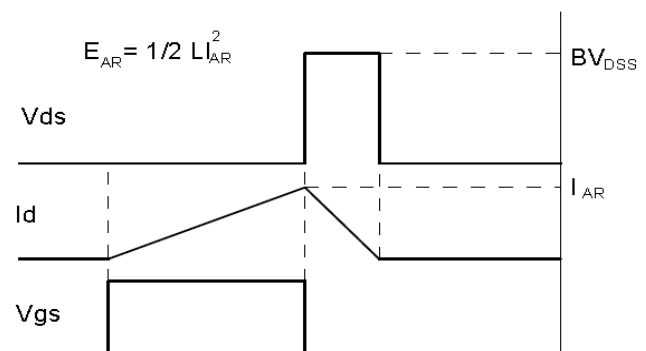
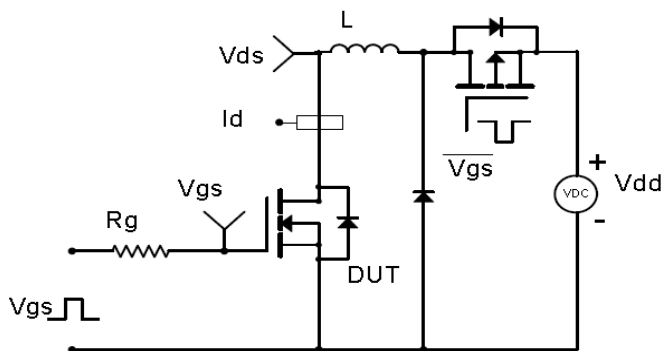
Gate Charge Test Circuit & Waveform



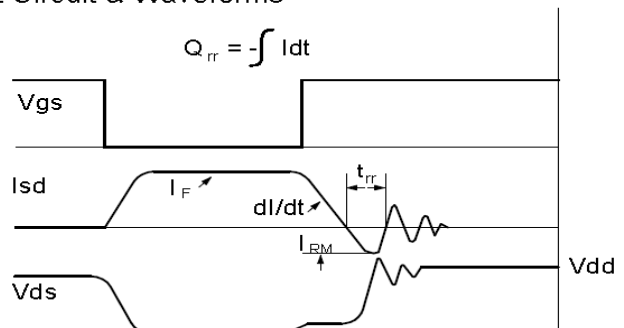
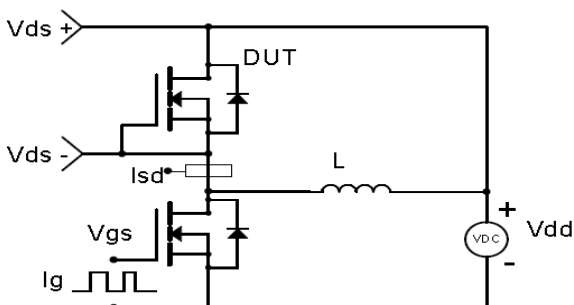
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

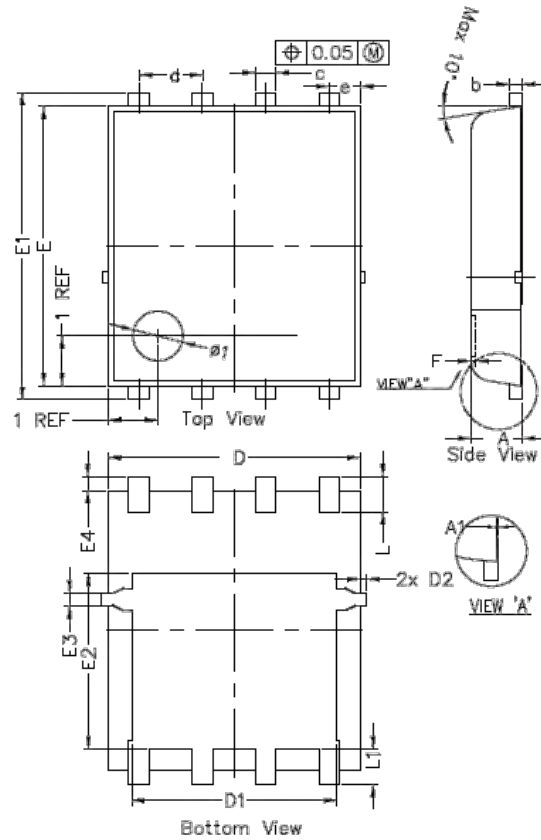


Diode Recovery Test Circuit & Waveforms





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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