

Product Summary

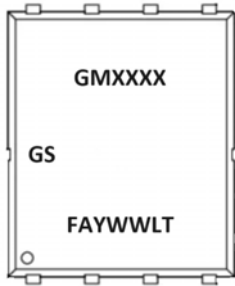
V_{DS} (V)	$R_{DS(on),max}$ (mΩ)	I_D (A)
80	3.4 @ $V_{GS} = 10V$	160

Features

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

Application

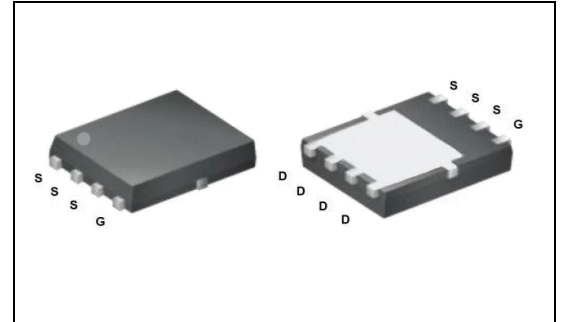
- PWM applications
- Load Switch
- Power management



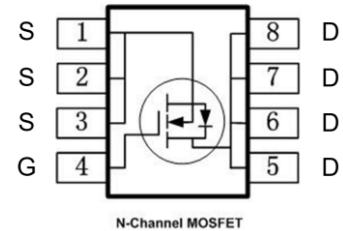
PDFN5060

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

PDFN5060



Equivalent circuit



Absolute maximum rating@25°C

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	80	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D@T_C=25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	160	A
$I_D@T_C=100^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	114	A
I_{DM}	Pulsed Drain Current ¹	640	A
EAS	Single Pulse Avalanche Energy ²	900	mJ
$P_D@T_C=25^\circ C$	Total Power Dissipation	179	W
T_{STG}	Storage Temperature Range	-55 to 150	°C
T_J	Operating Junction Temperature Range	-55 to 150	°C

Thermal Characteristic

Parameter		Symbol	Max.	Unit
Thermal resistance, junction-to-case	Steady state	$R_{\theta JC}$	0.7	°C/W
Thermal resistance, junction-to-ambient ⁽³⁾	Steady state	$R_{\theta JA}$	40	

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	I _D = 250μA, V _{GS} = 0V	80	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 64V, V _{GS} = 0V	-	-	1.0	μA
I _{GSS}	Gate-Body Leakage Current	V _{DS} = 0V, V _{GS} = ±20V	-	-	±100	nA
On Characteristics						
V _{GS(th)}	Gate Threshold Voltage ⁽³⁾	V _{DS} = V _{GS} , I _D = 250μA	2.2	3.1	4.0	V
R _{DS(ON)}	Static Drain-Source ON-Resistance ⁽³⁾	V _{GS} = 10V, I _D = 20A	-	2.6	3.4	mΩ
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{GS} = 0V, V _{DS} = 40V, f = 1MHz	-	6300	-	pF
C _{oss}	Output Capacitance		-	1250	-	pF
C _{rss}	Reverse Transfer Capacitance		-	24	-	pF
Q _g	Total Gate Charge	V _{GS} = 10V V _{DS} = 40V, I _D = 20A	-	93	-	nC
Q _{gs}	Gate Source Charge		-	34	-	nC
Q _{gd}	Gate Drain("Miller") Charge		-	17	-	nC
Switching Characteristics						
t _{d(on)}	Turn-On DelayTime	V _{GS} = 10V, V _{DD} = 40V I _D = 20A, R _{GEN} = 6Ω	-	32	-	ns
t _r	Turn-On Rise Time		-	34	-	ns
t _{d(off)}	Turn-Off DelayTime		-	62	-	ns
t _f	Turn-Off Fall Time		-	31	-	ns
Drain-Source Diode Characteristics and Max Ratings						
I _S	Maximum Continuous Drain to Source Diode Forward Current		-	-	160	A
I _{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	640	A
V _{SD}	Drain to Source Diode Forward Voltage ⁽³⁾	V _{GS} = 0V, I _S = 20A	-	-	1.2	V

Notes:

- 1.Repetitive Rating: pulse width limited by maximum junction temperature
- 2.E_{AS} Condition:T_J=25°C,V_{DD}=40V,V_{GS}=10V,R_G=25Ω, L=3mH
- 3.R_{θJA} is measured with the device Mounted on a 1inch² pad of 2oz copper FR4 PCB
- 4.Pulse Test: pulse width: <300μs, Duty cycle: <0.5%

Typical Performance Characteristics

Figure 1: Power De-rating

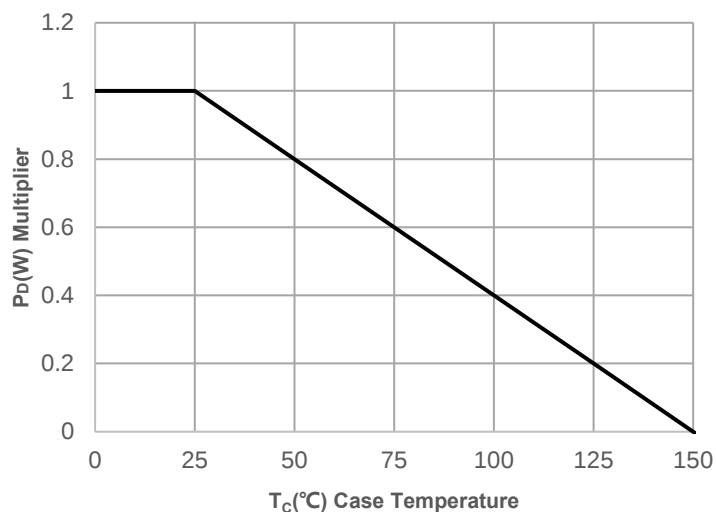


Figure 2: Current De-rating

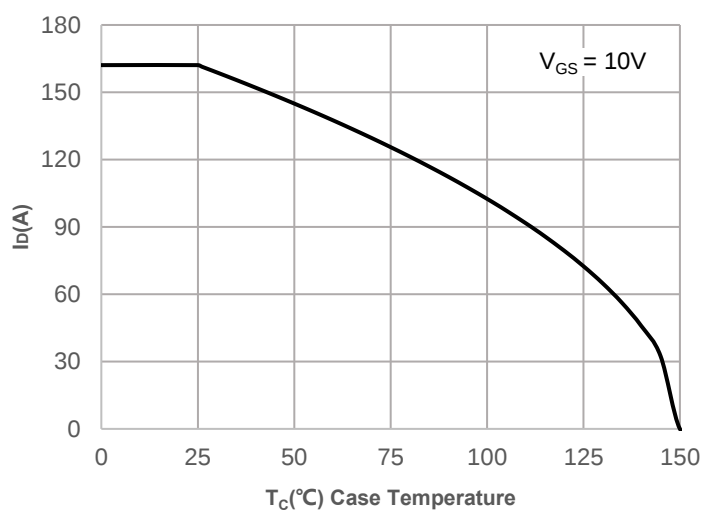


Figure 3: Output Characteristics

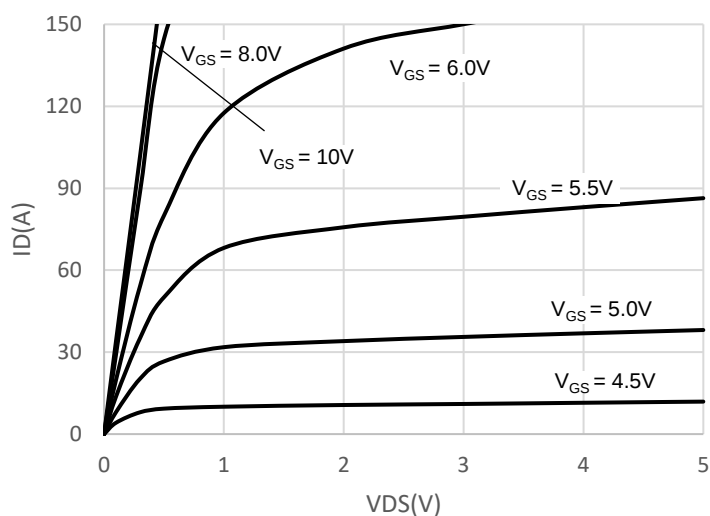


Figure 4: Typical Transfer Characteristics

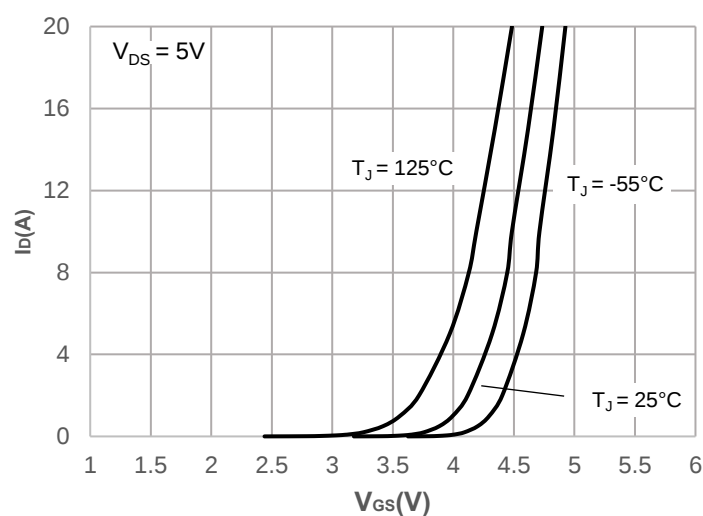


Figure 5: On-resistance vs. Drain Current

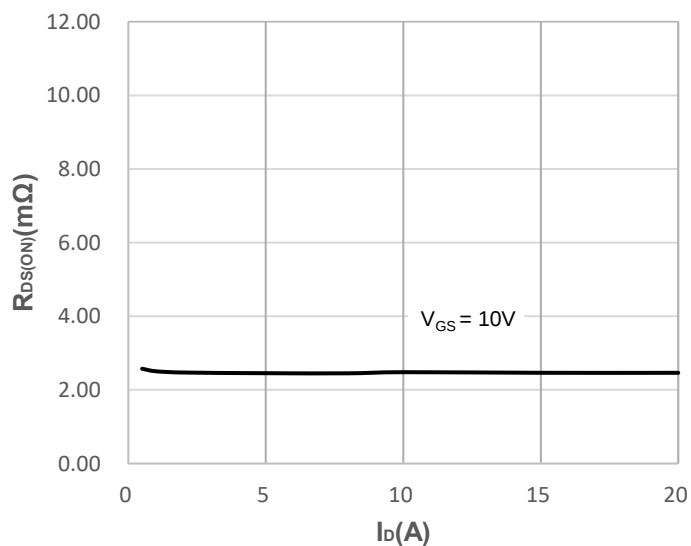
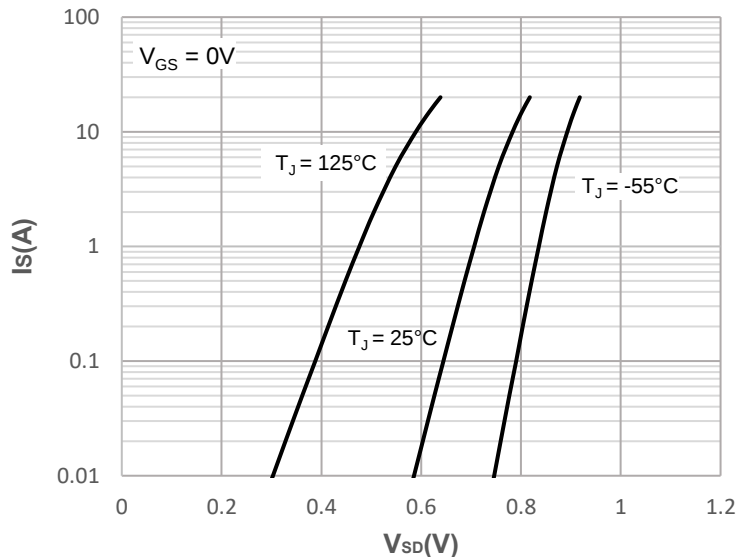


Figure 6: Body Diode Characteristics



Typical Performance Characteristics

Figure 7: Gate Charge Characteristics

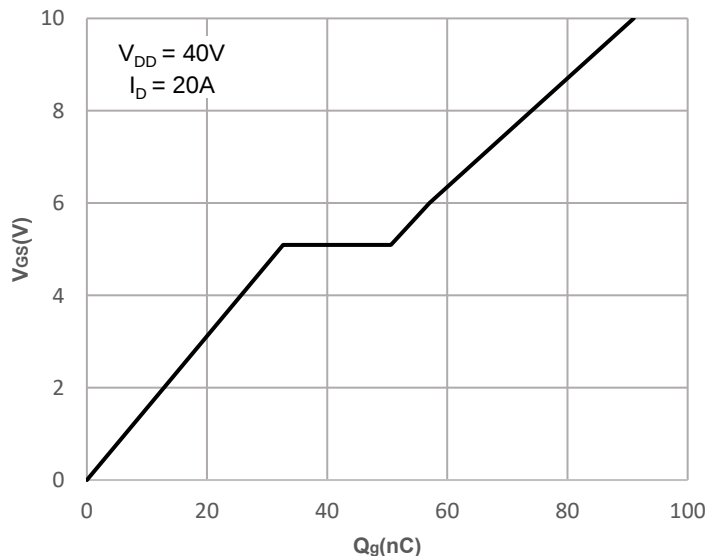


Figure 8: Capacitance Characteristics

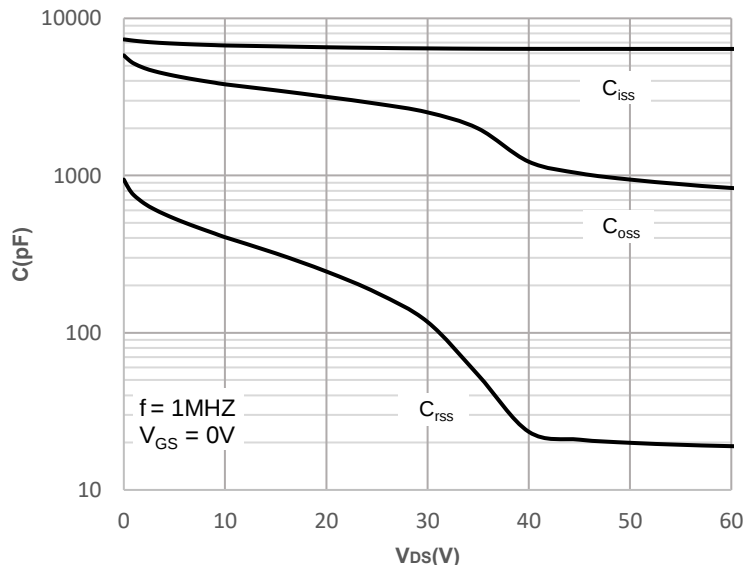


Figure 9: Normalized Breakdown voltage vs. Junction Temperature

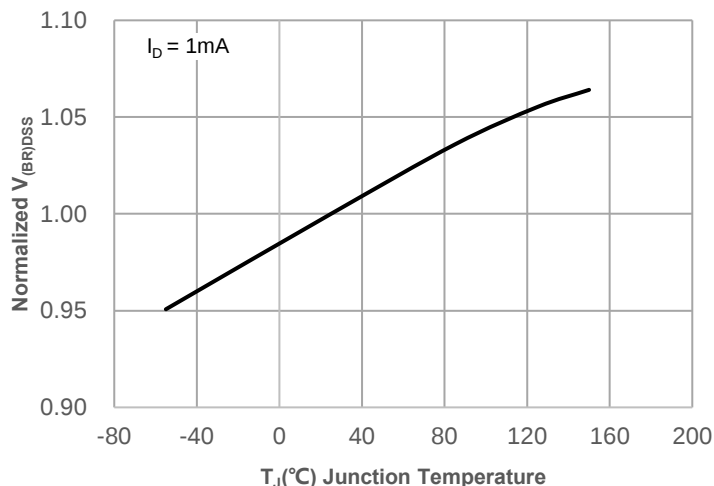


Figure 10: Normalized on Resistance vs. Junction Temperature

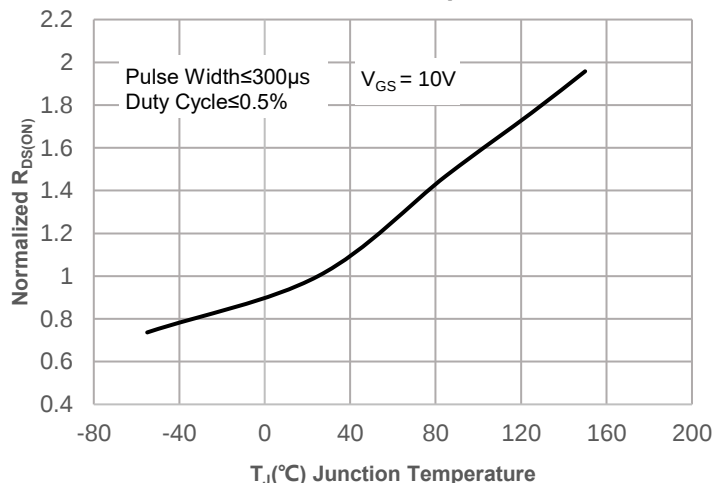


Figure 11: Normalized Threshold Voltage vs. Junction Temperature

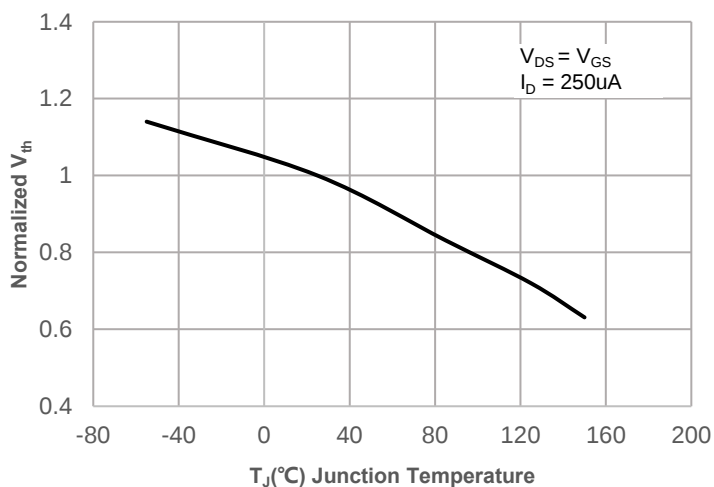
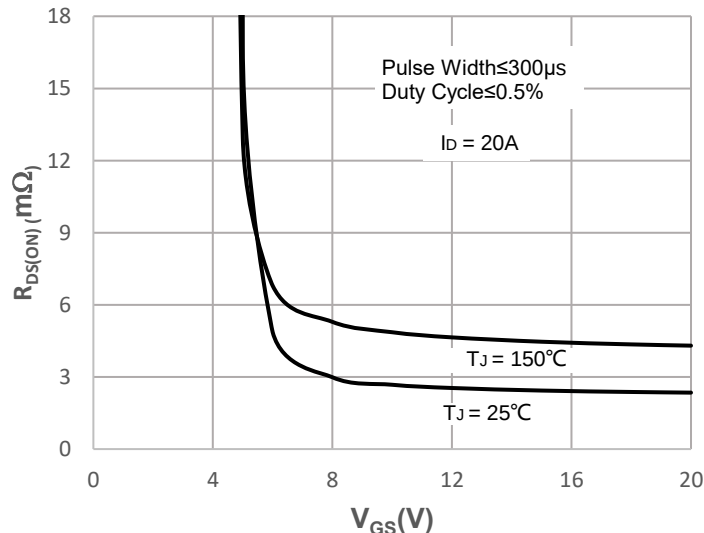
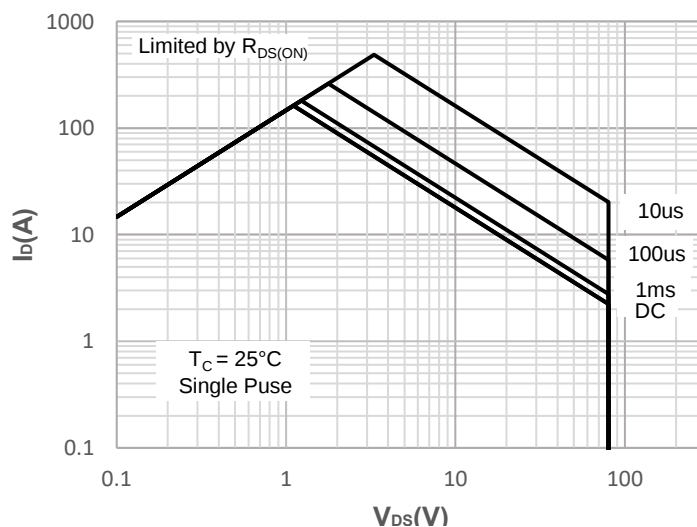
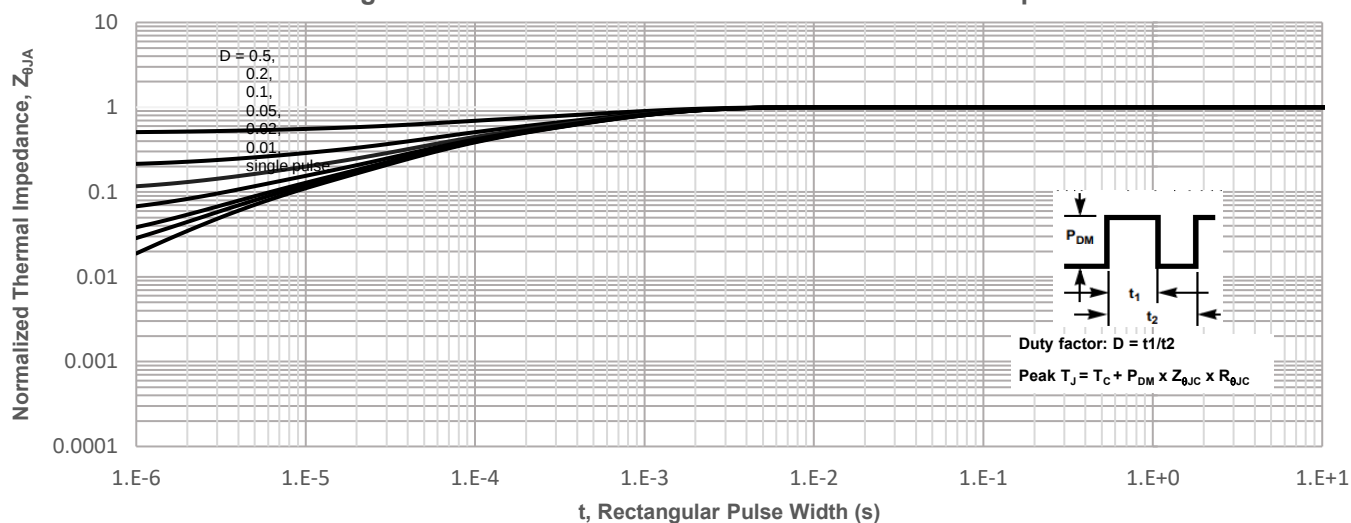
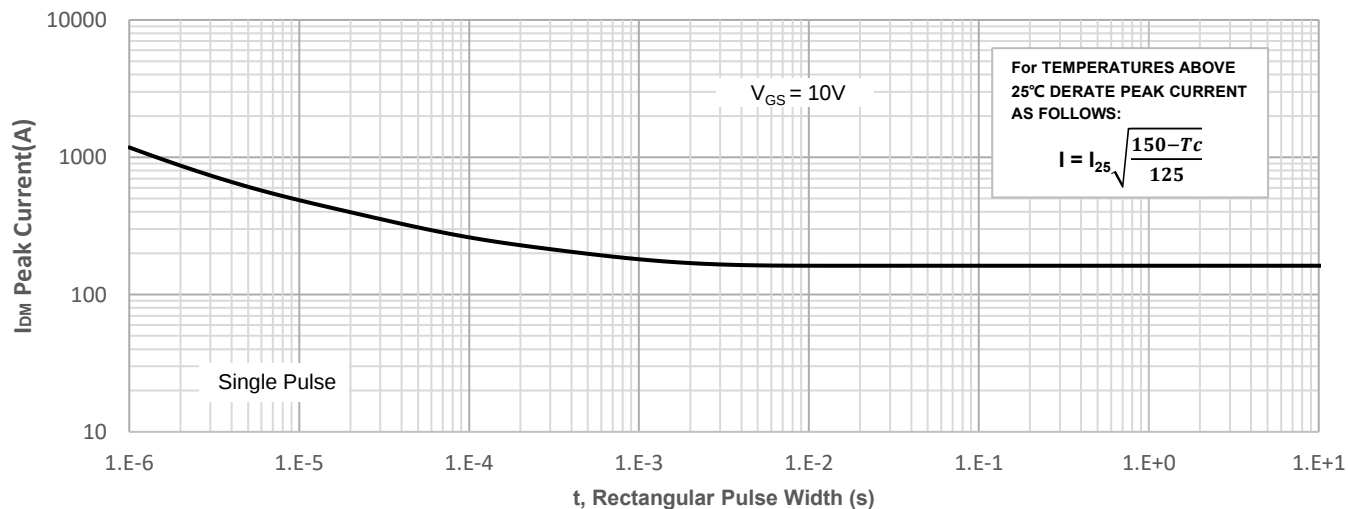


Figure 12: $R_{DS(on)}$ vs. V_{GS}

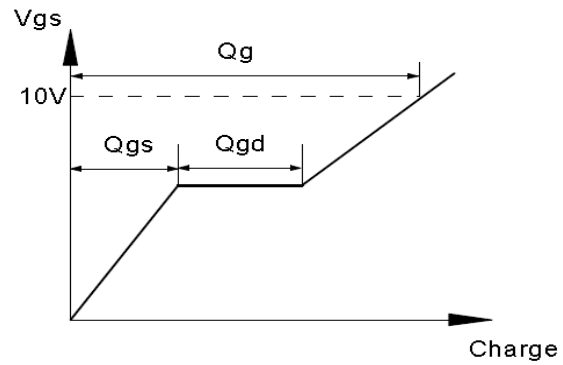
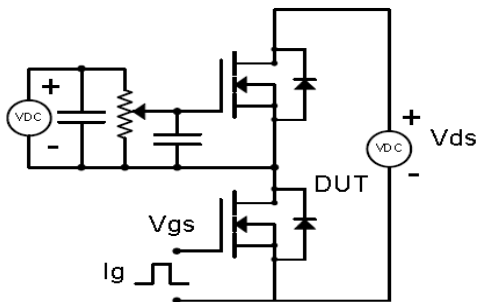


Typical Performance Characteristics

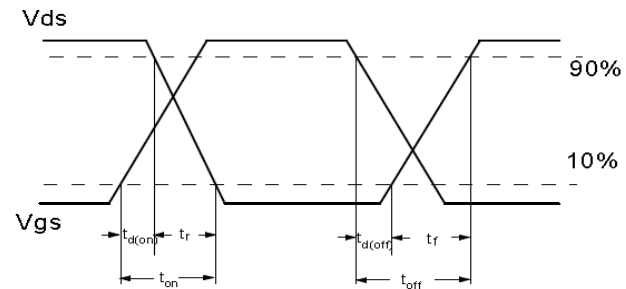
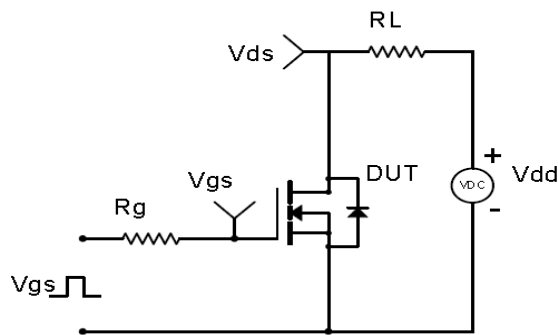
Figure 13: Maximum Safe Operating Area

Figure 14: Normalized Maximum Transient Thermal Impedance

Figure 15: Peak Current Capacity


Test Circuit & Waveform

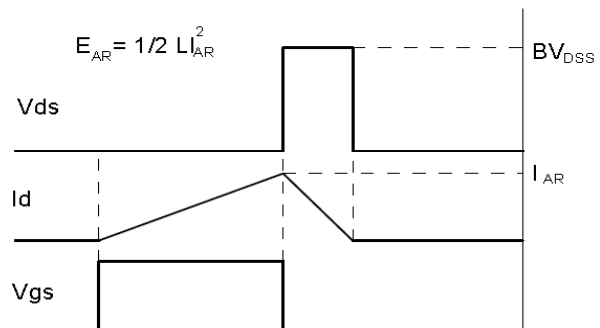
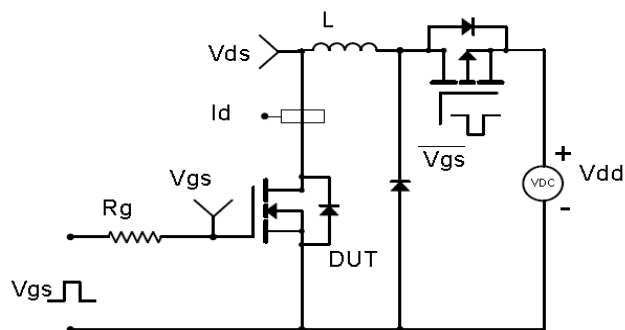
Gate Charge Test Circuit & Waveform



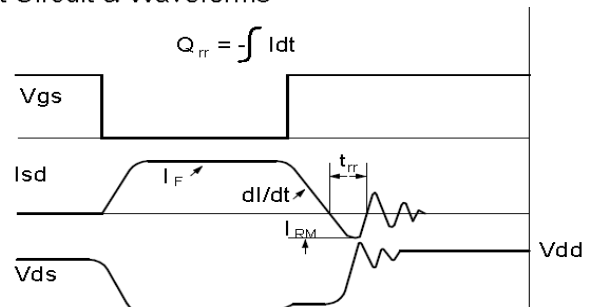
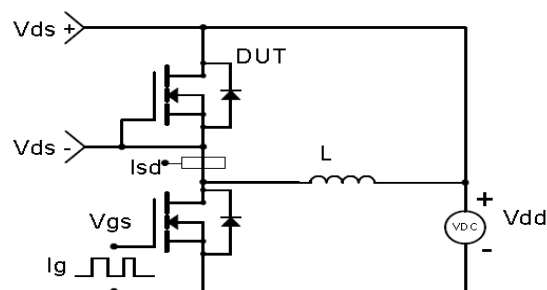
Resistive Switching Test Circuit & Waveforms

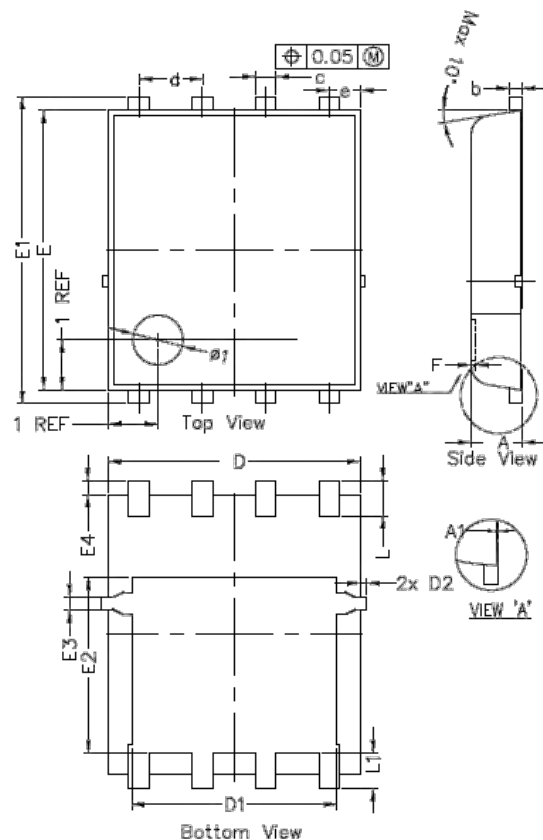


Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



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

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.