

Product Summary

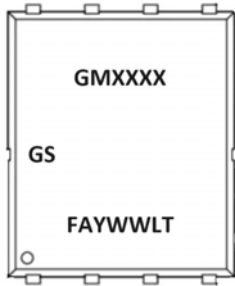
V_{DS} (V)	$R_{DS(on),max}$ (mΩ)	I_D (A)
80	2.5 @ $V_{GS} = 10V$	198

Features

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

Application

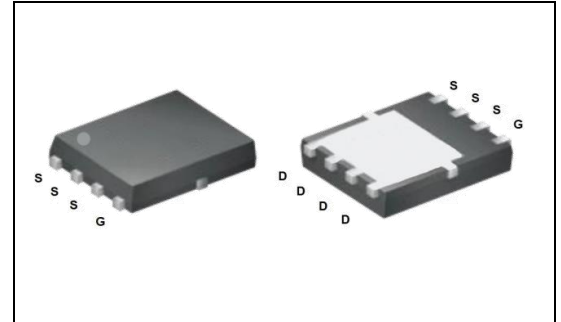
- PWM applications
- Load Switch
- Power management
- Motor Control Switch



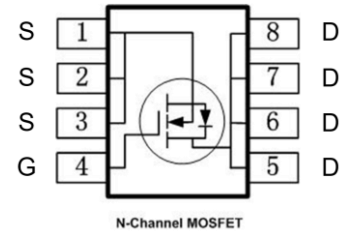
PDFN5060

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

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, $V_{GS} @ 10V$	198	A
$I_D@T_C=100^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	140	A
I_{DM}	Pulsed Drain Current ¹	790	A
EAS	Single Pulse Avalanche Energy ²	960	mJ
$P_D@T_C=25^\circ C$	Total Power Dissipation	193	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	$R_{\theta JC}$	0.65	°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} = 80V, 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	2.0	3.0	4.0	V
R _{DS(ON)}	Static Drain-Source ON-Resistance ⁽³⁾	V _{GS} = 10V, I _D = 50A	-	2.1	2.5	mΩ
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{GS} = 0V, V _{DS} = 40V, f = 1MHz	-	5520	-	pF
C _{oss}	Output Capacitance		-	990	-	pF
C _{rss}	Reverse Transfer Capacitance		-	31	-	pF
Q _g	Total Gate Charge	V _{GS} = 10V V _{DS} = 40V, I _D = 20A	-	76	-	nC
Q _{gs}	Gate Source Charge		-	30	-	nC
Q _{gd}	Gate Drain("Miller") Charge		-	10	-	nC
Switching Characteristics						
t _{d(on)}	Turn-On DelayTime	V _{GS} = 10V, V _{DD} = 40V I _D = 20A, R _{GEN} = 3Ω	-	21	-	ns
t _r	Turn-On Rise Time		-	90	-	ns
t _{d(off)}	Turn-Off DelayTime		-	42	-	ns
t _f	Turn-Off Fall Time		-	91	-	ns
Drain-Source Diode Characteristics and Max Ratings						
I _S	Maximum Continuous Drain to Source Diode Forward Current		-	-	198	A
I _{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	790	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

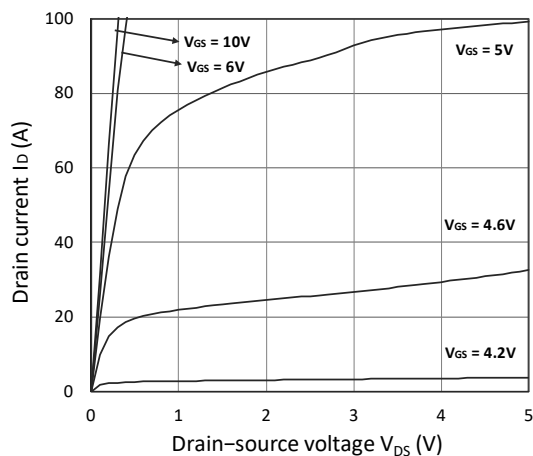


Figure 1. Output Characteristics

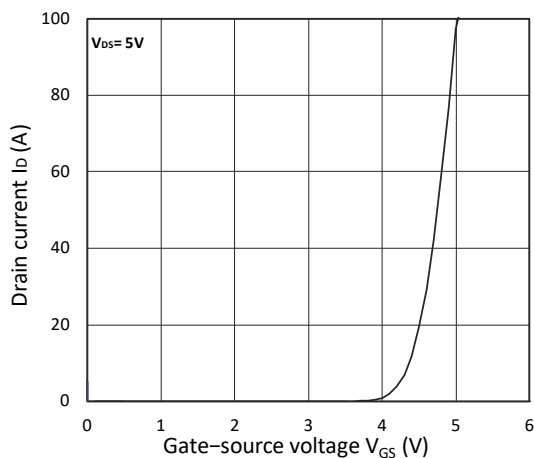


Figure 2. Transfer Characteristics

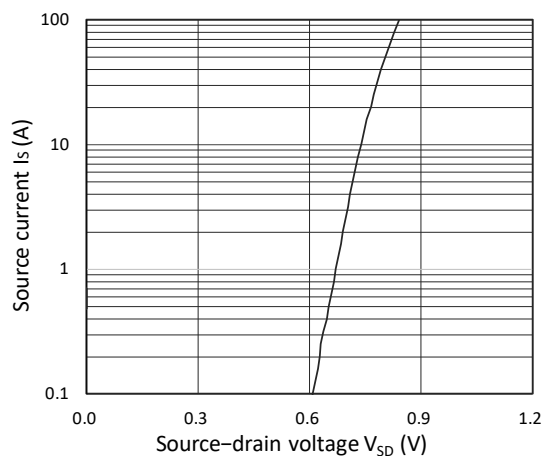


Figure 3. Forward Characteristics of Reverse

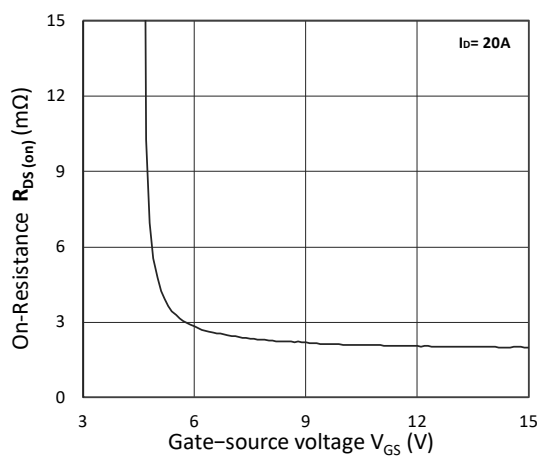


Figure 4. $R_{DS(on)}$ vs. V_{GS}

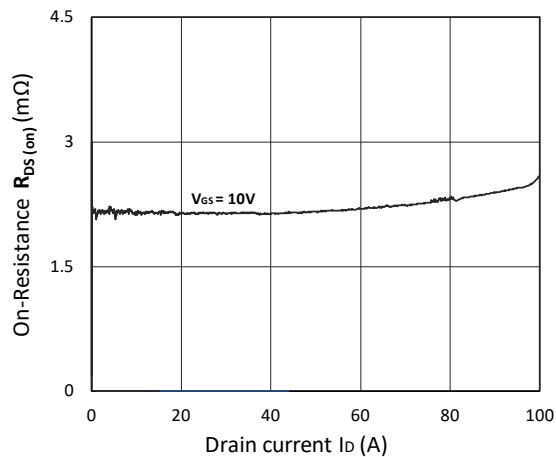


Figure 5. $R_{DS(on)}$ vs. I_D

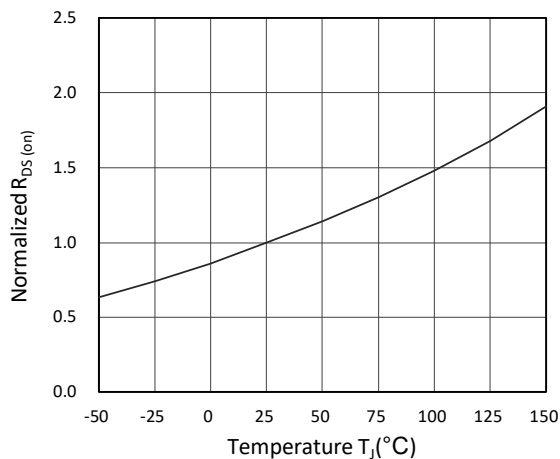


Figure 6. Normalized $R_{DS(on)}$ vs. Temperature

Typical Performance Characteristics

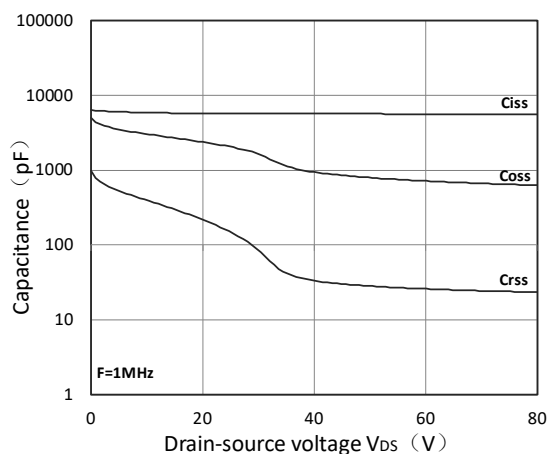


Figure 7. Capacitance Characteristics

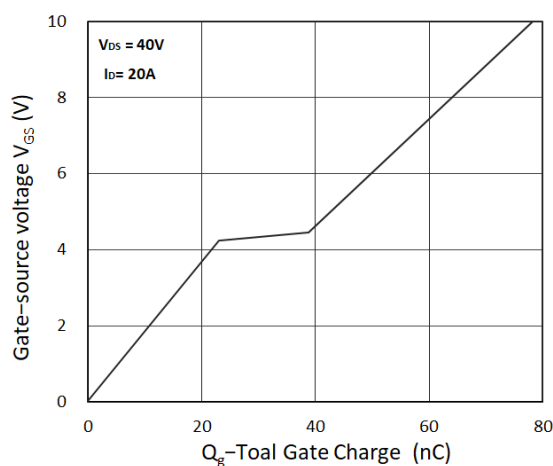


Figure 8. Gate Charge Characteristics

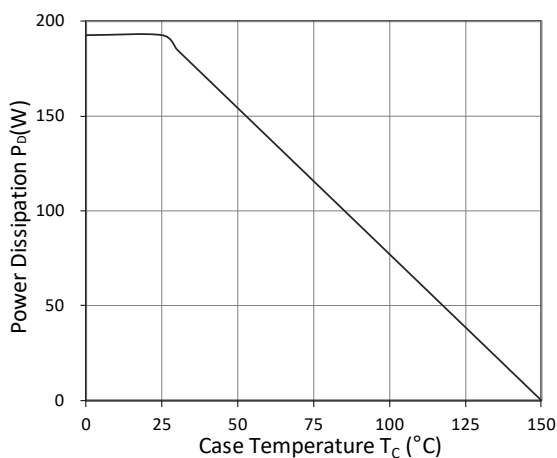


Figure 9. Power Dissipation

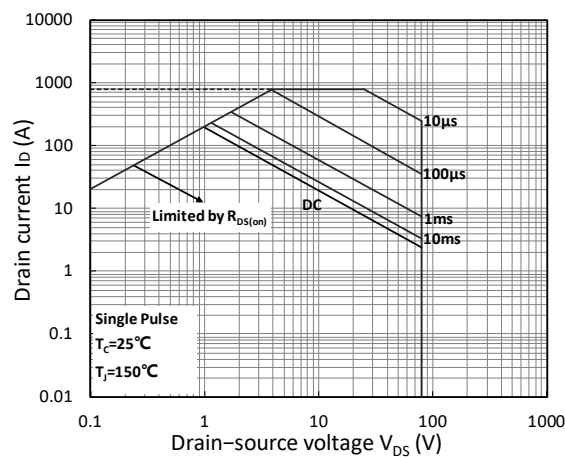


Figure 10. Safe Operating Area

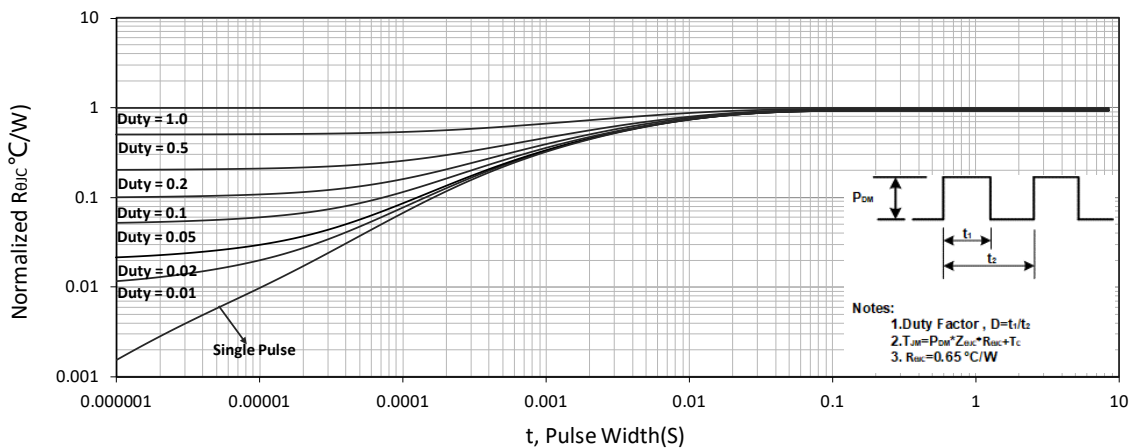
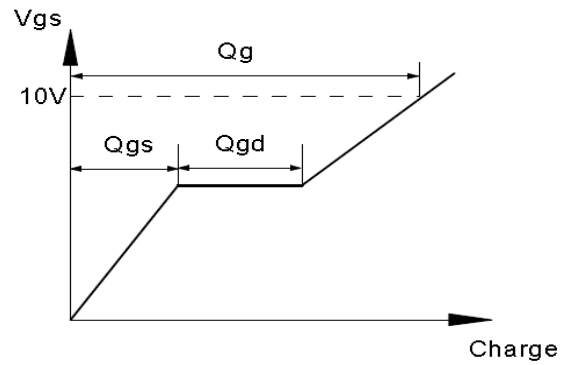
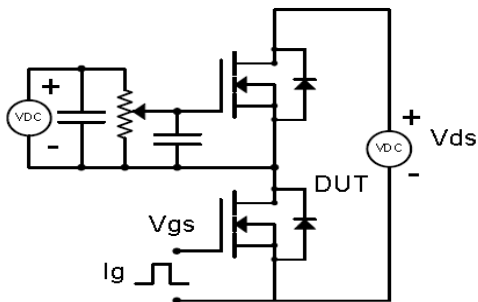


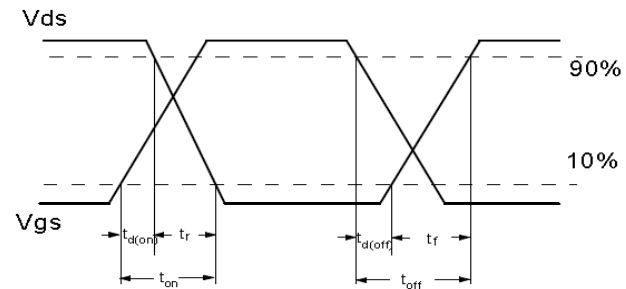
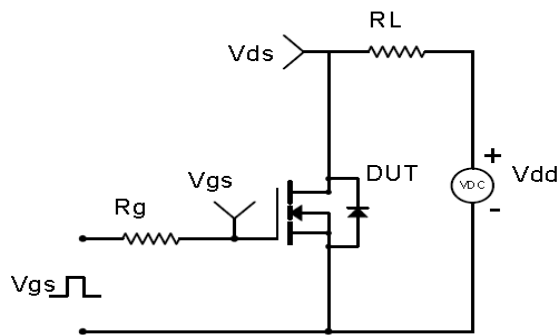
Figure 11. Normalized Maximum Transient Thermal Impedance

Test Circuit & Waveform

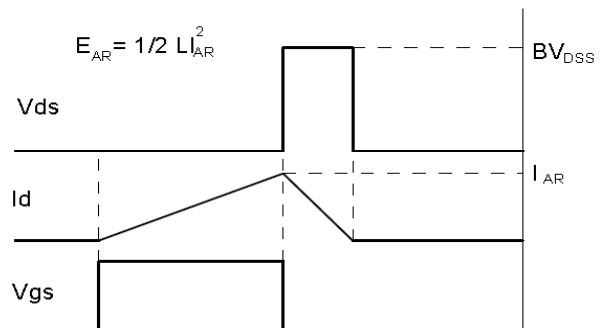
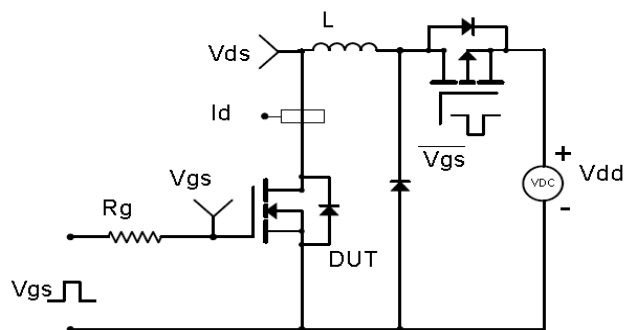
Gate Charge Test Circuit & Waveform



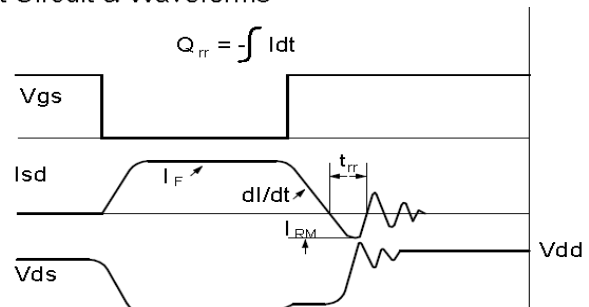
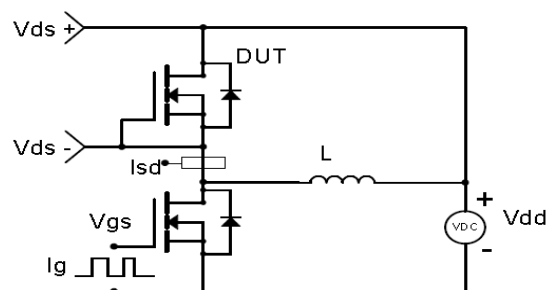
Resistive Switching Test Circuit & Waveforms

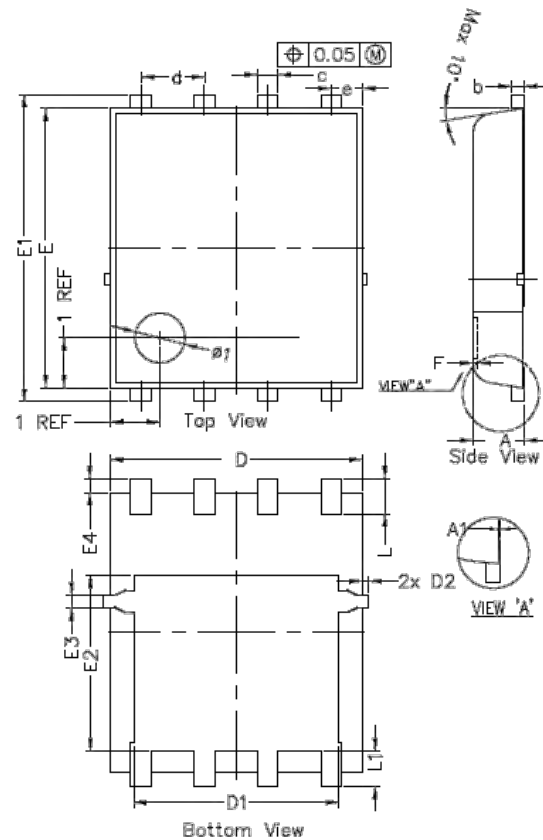


Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



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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