

Product Summary

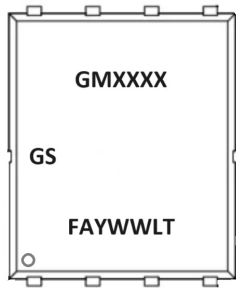
V_{DS} (V)	$R_{DS(on),max}$ (mΩ)	I_D (A)
100	5.8 @ $V_{GS} = 10V$	106 ⁽¹⁾

Features

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

Application

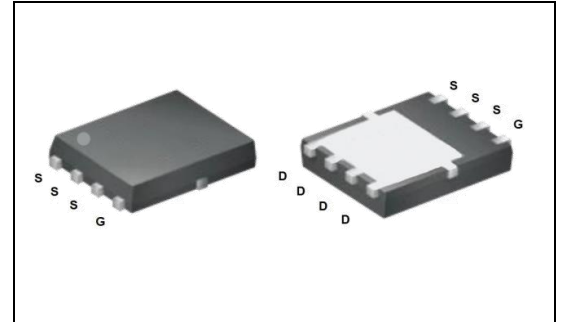
- DC/DC conversion
- Power switch
- Motor drives
- Synchronous Rectification in SMPS



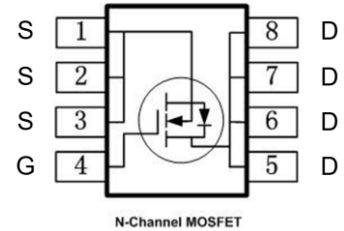
PDFN5060

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

PDFN5060



Equivalent circuit



Absolute maximum rating@25°C

Parameter	Symbol	Limit	Unit
Drain-source voltage	V_{DS}	100	V
Gate-source voltage	V_{GS}	±20	
Continuous drain current	I_D	106	A
	I_D	67	
Pulsed drain current ⁽²⁾	$I_{D,pulse}$	424	
Avalanche energy, single pulse ⁽³⁾	E_{AS}	197	mJ
Power dissipation	P_D	125	W
Operating junction and storage temperature range	T_J, T_{stg}	-55 to 150	°C

Thermal Characteristic

Parameter	Symbol	Max.	Unit
Thermal resistance, junction-to-case	$R_{\theta JC}$	1.1	°C/W
Thermal resistance, junction-to-ambient ⁽⁴⁾	$R_{\theta JA}$	44	

Electrical Characteristics (T_J=25°C 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	1.1	1.4	2.3	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 = 50 A		5.5	5.8	mΩ
Forward transconductance ⁽⁵⁾	g _{fs}	V _{DS} = 5 V, I _D = 40 A		70		S
Gate resistance	R _g	f = 1 MHz		1.3		Ω
Dynamic ⁽⁵⁾						
Total gate charge	Q _g	V _{DS} = 50 V, I _D = 40 A, V _{GS} = 10 V		53		nC
Gate-source charge	Q _{gs}			12		
Gate-drain charge	Q _{gd}			9		
Turn-on delay time	t _{d(on)}	V _{DS} = 50 V, I _D = 50 A, V _{GS} = 10 V, R _{GEN} = 6 Ω		53		ns
Rise time	t _r			88		
Turn-off delay time	t _{d(off)}			85		
Fall time	t _f			22		
Input capacitance	C _{iss}	V _{DS} = 50 V, V _{GS} = 0 V, f = 1 MHz		3540		pF
Output capacitance	C _{oss}			435		
Reverse transfer capacitance	C _{rss}			15		
Reverse Diode Characteristics ⁽⁵⁾						
Diode forward voltage	V _{SD}	V _{GS} = 0 V, I _F = 50 A		1.02	1.2	V
Reverse recovery time	t _{rr}	V _{DS} = 50 V, I _F = 50 A, di/dt = 100 A/μs		72		ns
Reverse recovery charge	Q _{rr}			138		nC

Notes

- (1) Package limited.
- (2) Pulse width limited by maximum junction temperature.
- (3) V_{DS} = 50 V, V_{GS} = 10 V, L = 0.3 mH.
- (4) R_{θJA} is determined with the device mounted on a 1 in² pad 2 oz copper pad on a 1.5x1.5 in. board of FR-4 material.
- (5) Guaranteed by design, not subject to production testing.



Typical Performance Characteristics

Fig.1 Typ. transfer characteristics

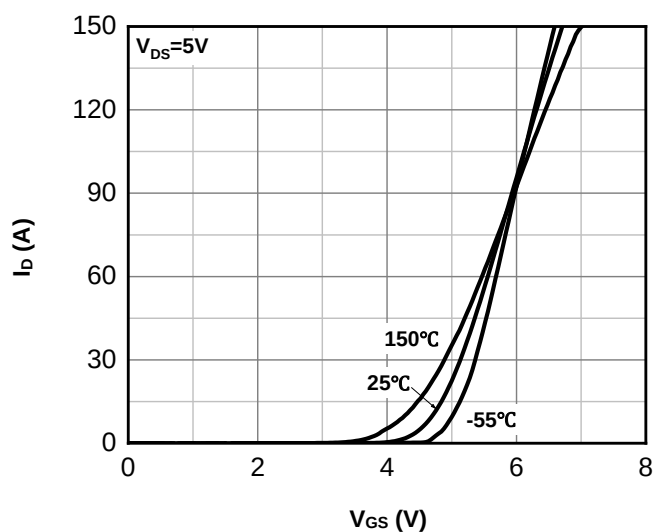


Fig.2 Typ. output characteristics

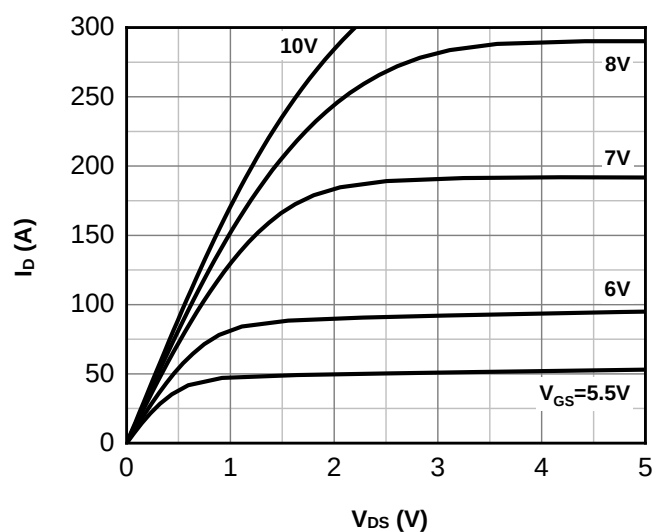


Fig.3 Normalized on-resistance vs drain current

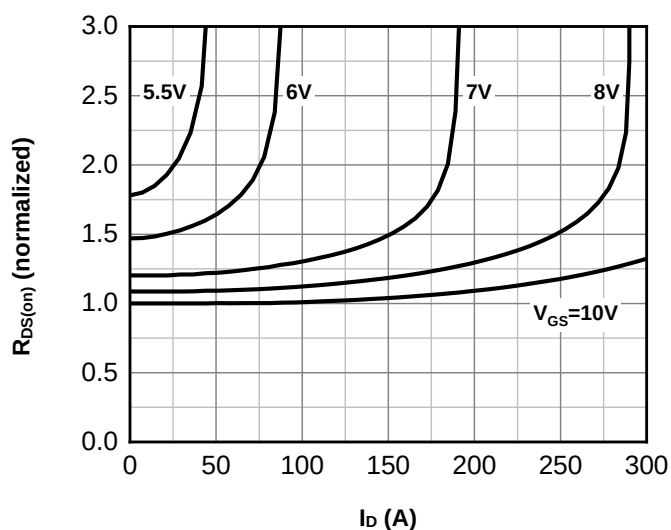


Fig.4 Typ. on-resistance vs gate-source voltage

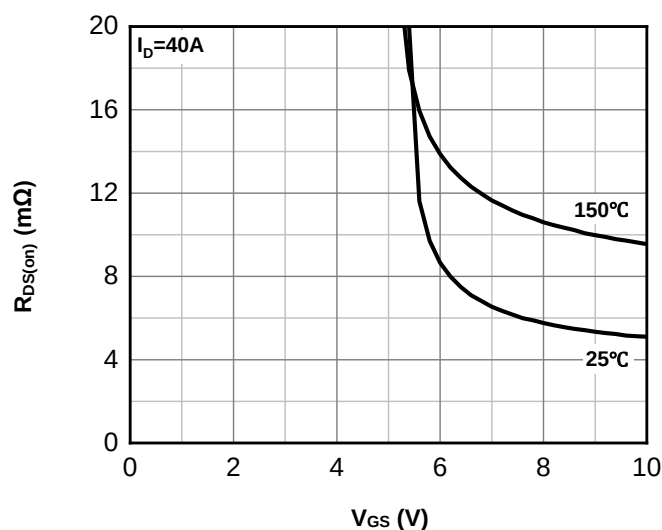


Fig.5 Normalized on-resistance vs junction temperature

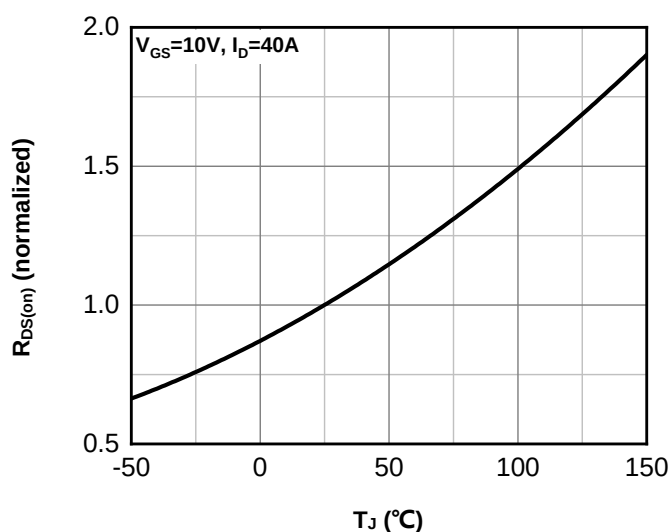
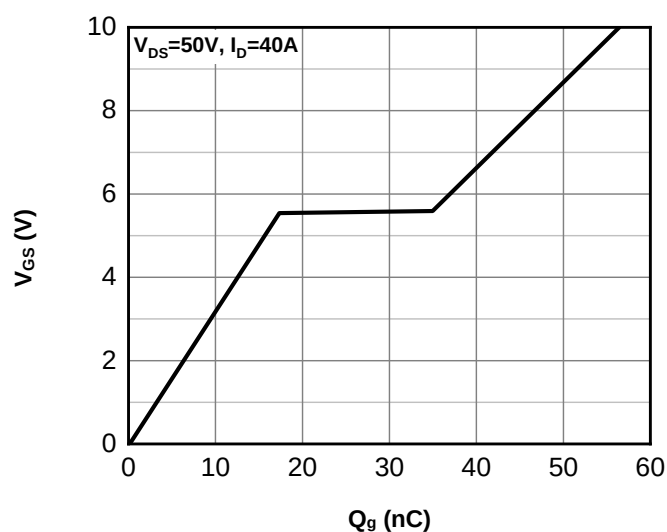


Fig.6 Typ. gate charge



Typical Performance Characteristics

Fig.7 Typ. forward characteristics of body diode

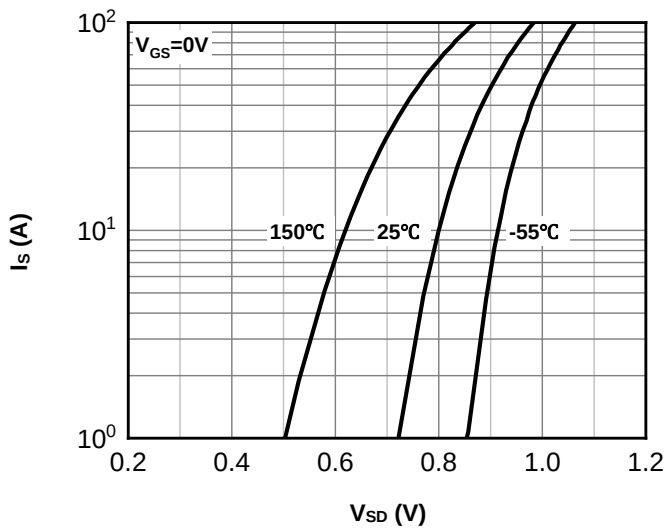


Fig.8 Safe operating area

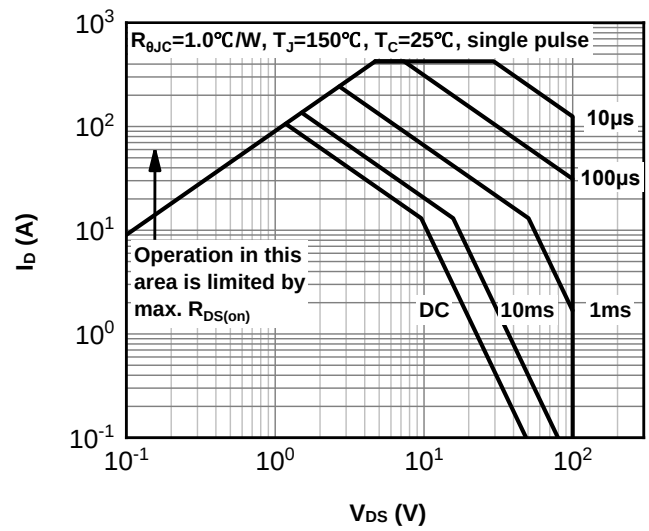


Fig.9 Typ. Capacitance

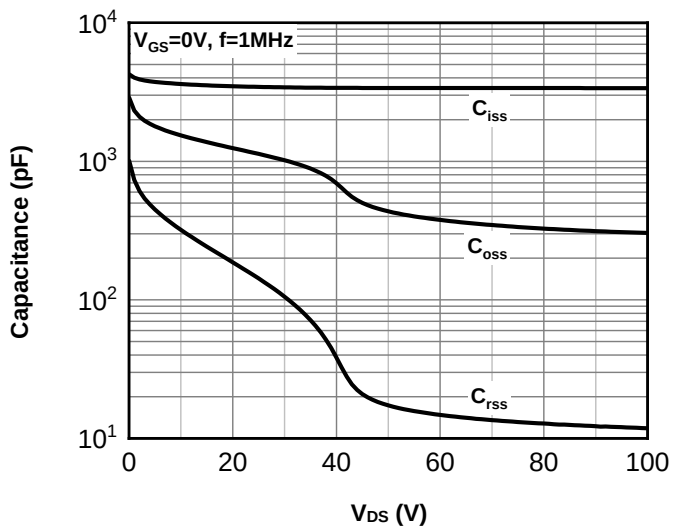


Fig.10 Single pulse maximum power dissipation

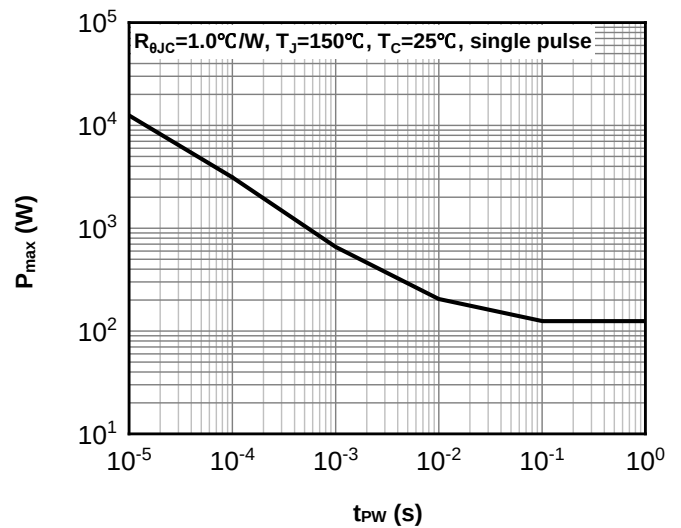


Fig.11 Max. power dissipation vs case temperature

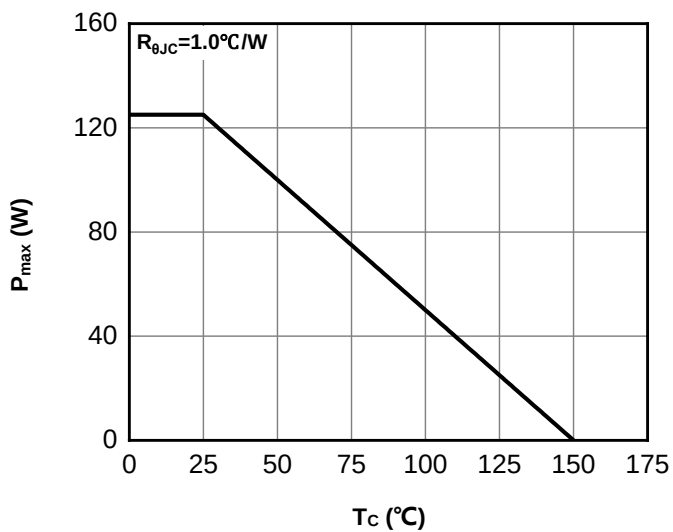
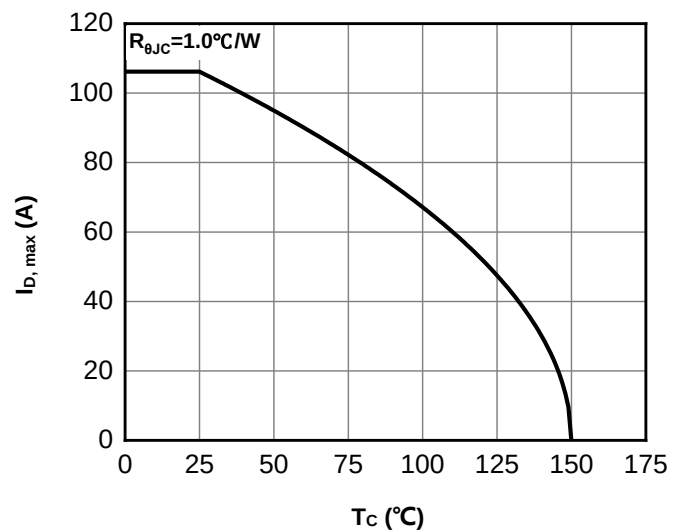


Fig.12 Max. continuous drain current vs case temperature





Typical Performance Characteristics

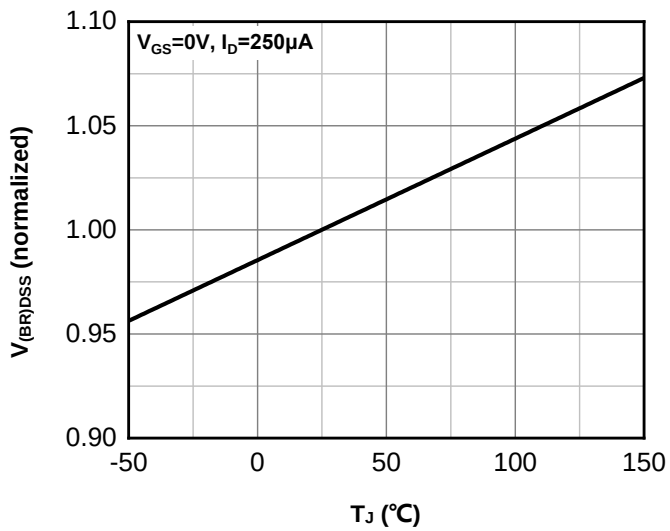
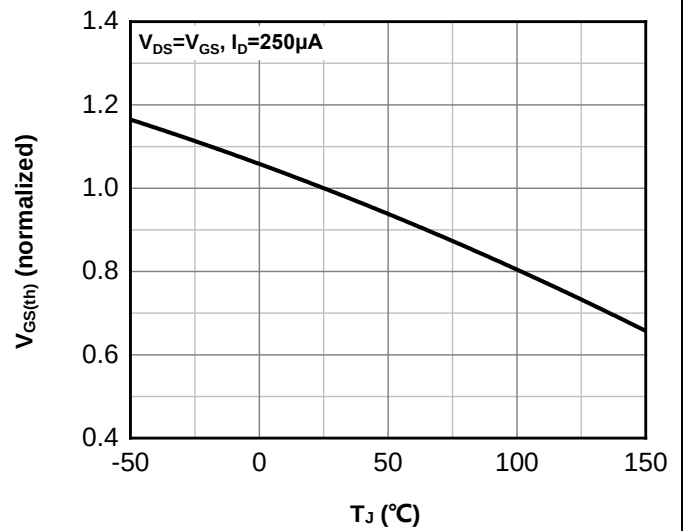
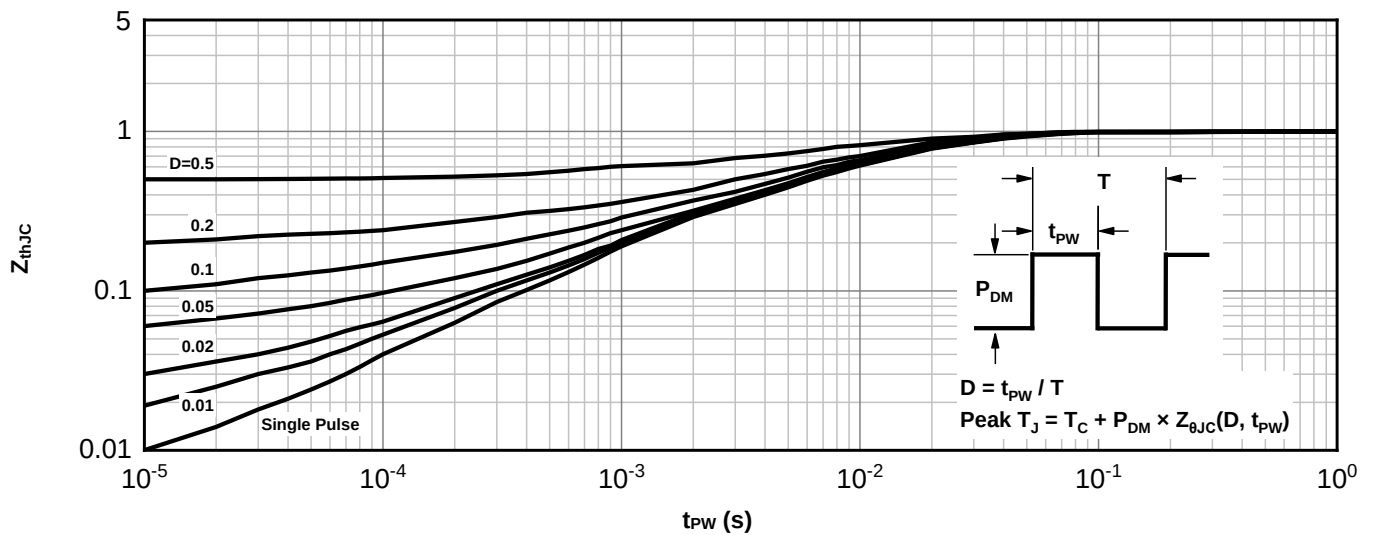
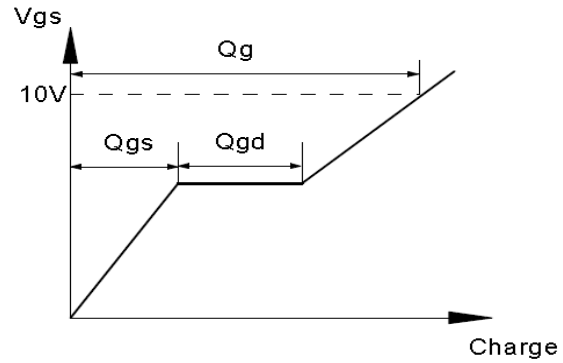
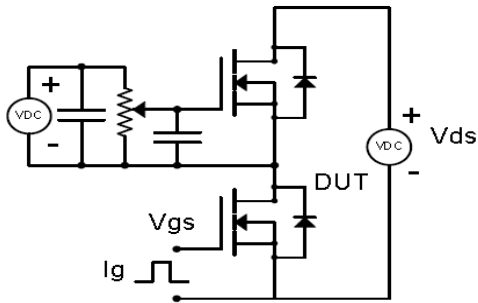
Fig.13 Normalized $V_{(BR)DSS}$ vs junction temperatureFig.14 Normalized $V_{GS(th)}$ vs junction temperature

Fig.15 Transient thermal impedance from junction to case

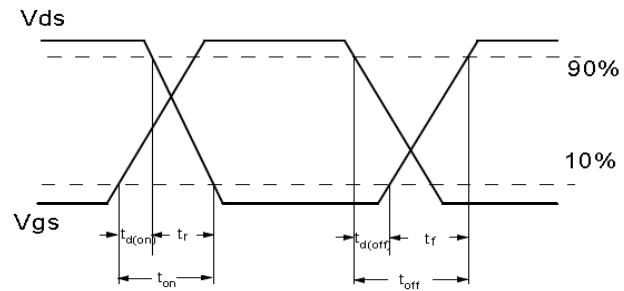
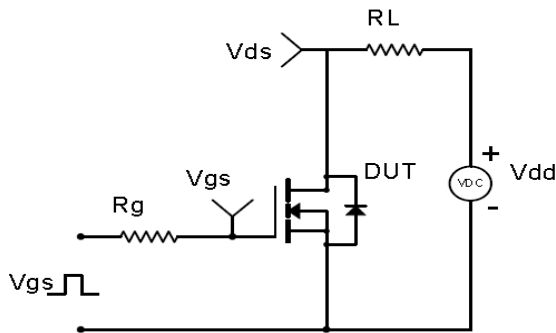


Test Circuit & Waveform

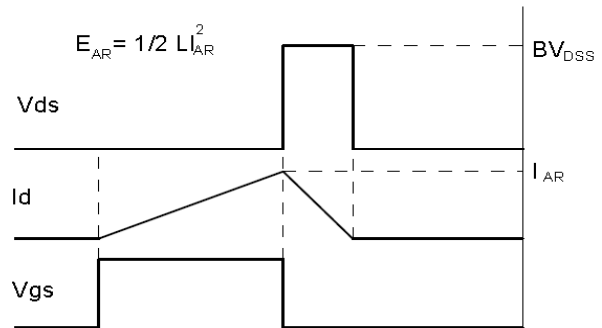
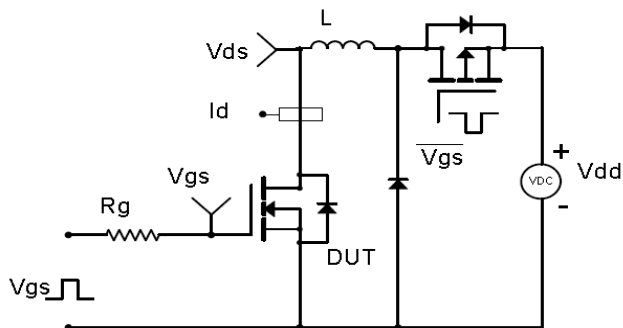
Gate Charge Test Circuit & Waveform



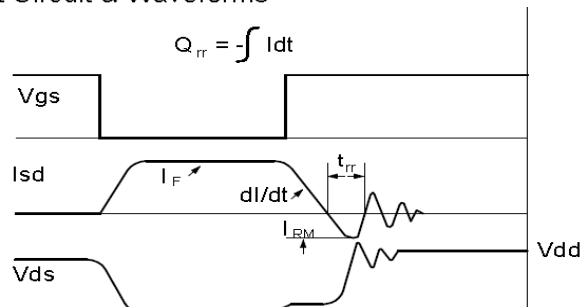
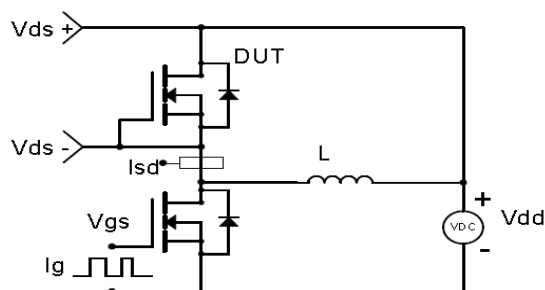
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

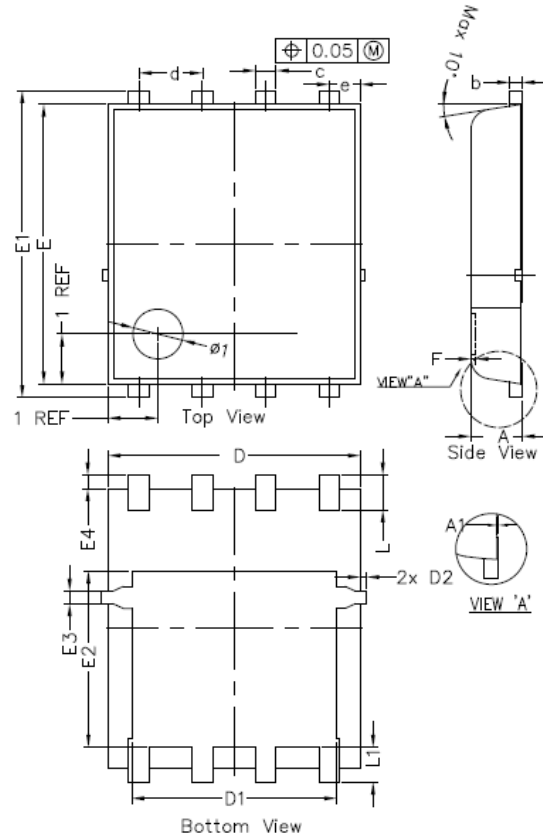


Diode Recovery Test Circuit & Waveforms





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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