

Product Summary

V_{DS} (V)	$R_{DS(on),max}$ (mΩ)	I_D (A)
60	1.6 @ $V_{GS} = 10V$	135 ⁽¹⁾

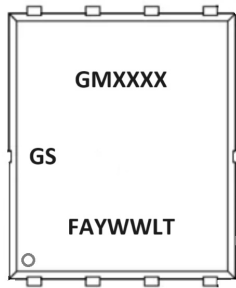
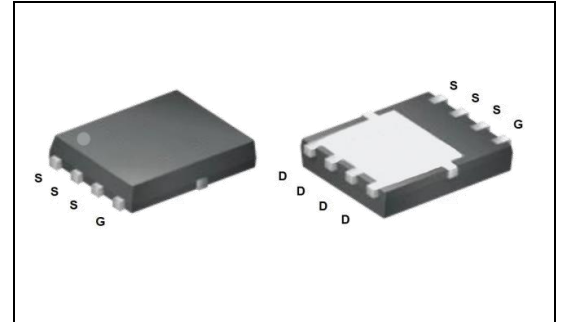
Features

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

Application

- DC/DC conversion
- Power switch
- Motor drives

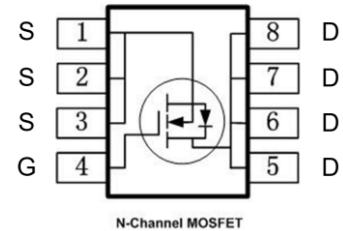
PDFN5X6-8L



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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°C

Parameter	Symbol	Limit	Unit
Drain-source voltage	V_{DS}	60	V
Gate-source voltage	V_{GS}	±20	
Continuous drain current	I_D	$T_C=25^{\circ}C^{(1)}$	135
		$T_C=100^{\circ}C^{(1)}$	135
		$T_A=25^{\circ}C^{(4)}$	30
Pulsed drain current ⁽²⁾	$I_{D,pulse}$	540	A
Avalanche energy, single pulse ⁽³⁾	E_{AS}	739	
Power dissipation	P_D	$T_C=25^{\circ}C$	147
		$T_A=25^{\circ}C^{(4)}$	2.7
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	$R_{\theta JC}$	0.85	°C/W
Thermal resistance, junction-to-ambient ⁽⁴⁾	$R_{\theta JA}$	45	

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	60			V
Gate-source threshold voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA	1.7	2.5	3.3	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} = 60 V, V _{GS} = 0 V			1	μA
Drain-source on-resistance	R _{DS(on)}	V _{GS} = 10 V, I _D = 50 A		1.4	1.6	mΩ
Forward transconductance ⁽⁵⁾	g _{fs}	V _{DS} = 5 V, I _D = 50 A		121		S
Gate resistance	R _g			1	2	Ω
Dynamic ⁽⁵⁾						
Total gate charge	Q _g	V _{DS} = 30 V, I _D = 50 A, V _{GS} = 10 V		142	197	nC
Gate-source charge	Q _{gs}			28	41	
Gate-drain charge	Q _{gd}			41	58	
Turn-on delay time	t _{d(on)}	V _{DS} = 30 V, I _D = 50 A, V _{GS} = 10 V, R _{GEN} = 1.6 Ω		31	63	ns
Rise time	t _r			43	88	
Turn-off delay time	t _{d(off)}			81	162	
Fall time	t _f			23	46	
Input capacitance	C _{iss}	V _{DS} = 30 V, V _{GS} = 0 V, f = 1 MHz		7450	10459	pF
Output capacitance	C _{oss}			1680	2359	
Reverse transfer capacitance	C _{rss}			90	185	
Reverse Diode Characteristics ⁽⁵⁾						
Diode forward voltage	V _{SD}	V _{GS} = 0 V, I _F = 50 A		0.8	1.1	V
Reverse recovery time	t _{rr}	V _{DS} = 30 V, I _F = 50 A, di/dt = 100 A/μs		72	130	ns
Reverse recovery charge	Q _{rr}			110	201	nC

Notes

- (1) Package limited.
- (2) Pulse width limited by maximum junction temperature.
- (3) V_{DS} = 30 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

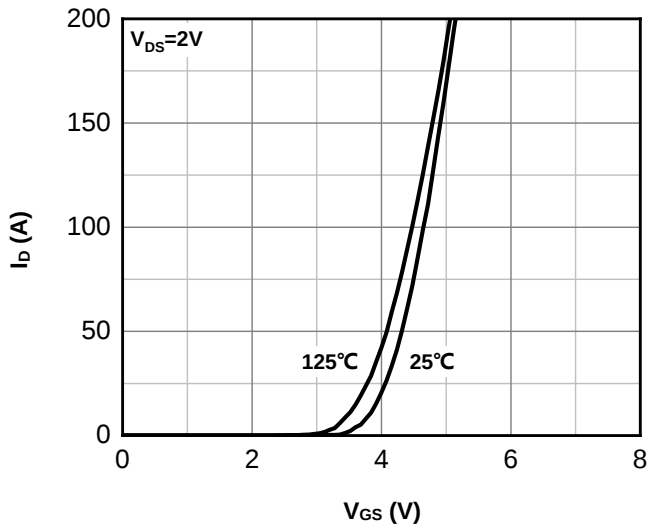


Fig.2 Typ. output characteristics

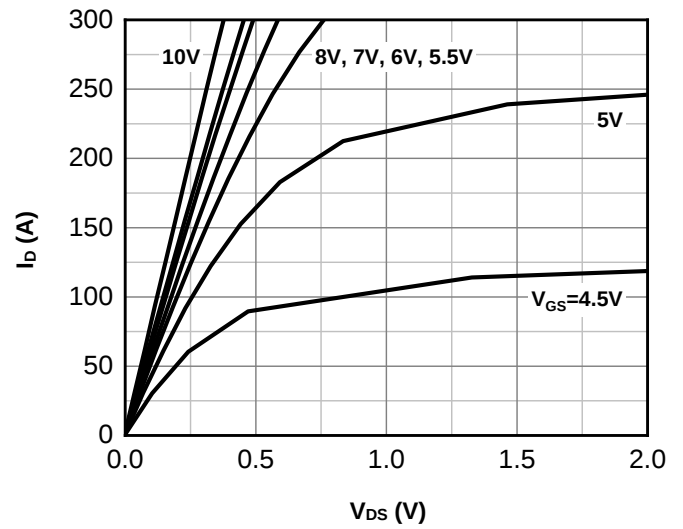


Fig.3 Normalized on-resistance vs drain current

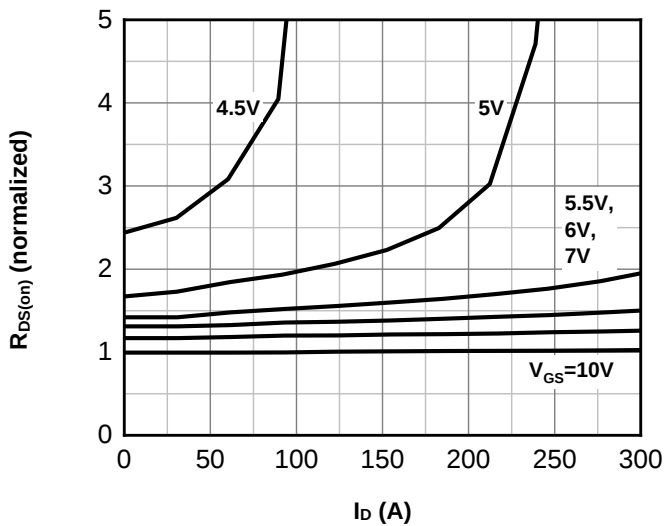


Fig.4 Typ. on-resistance vs gate-source voltage

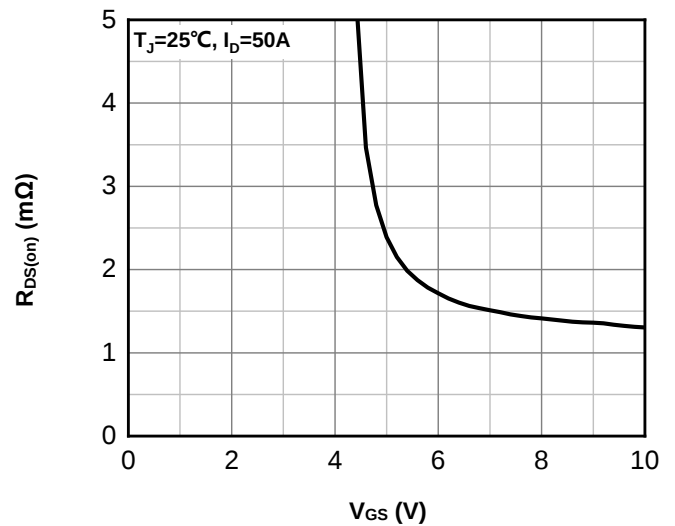


Fig.5 Normalized on-resistance vs junction temperature

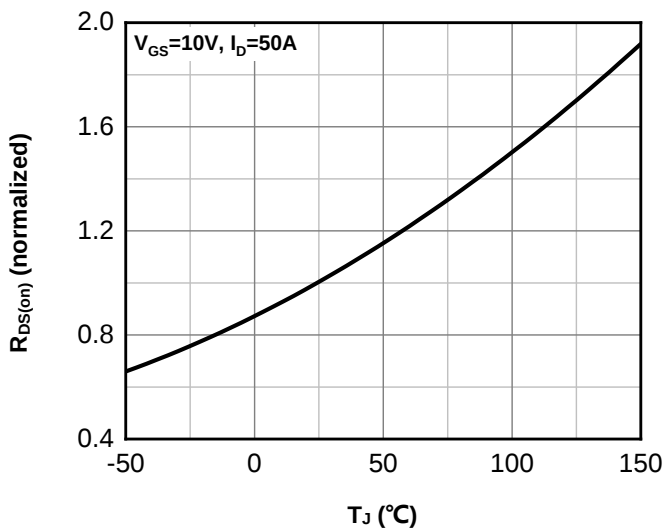
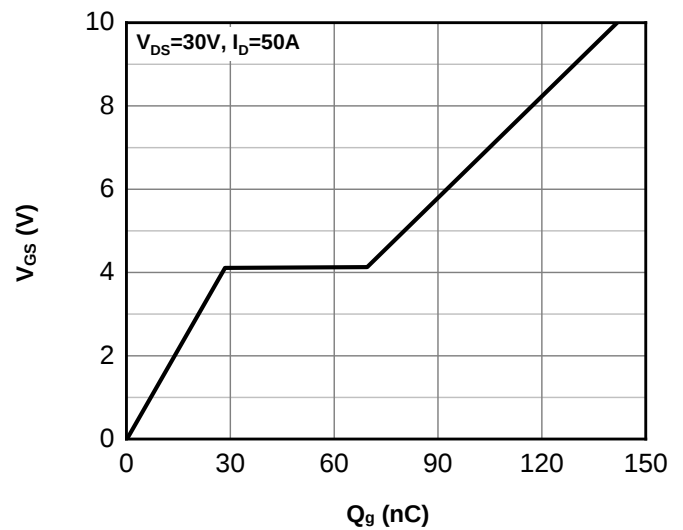


Fig.6 Typ. gate charge



Typical Performance Characteristics

Fig.7 Typ. forward characteristics of body diode

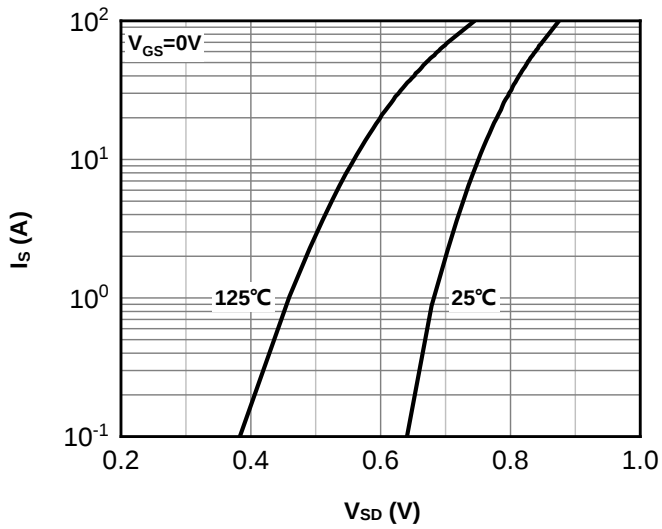


Fig.8 Safe operating area

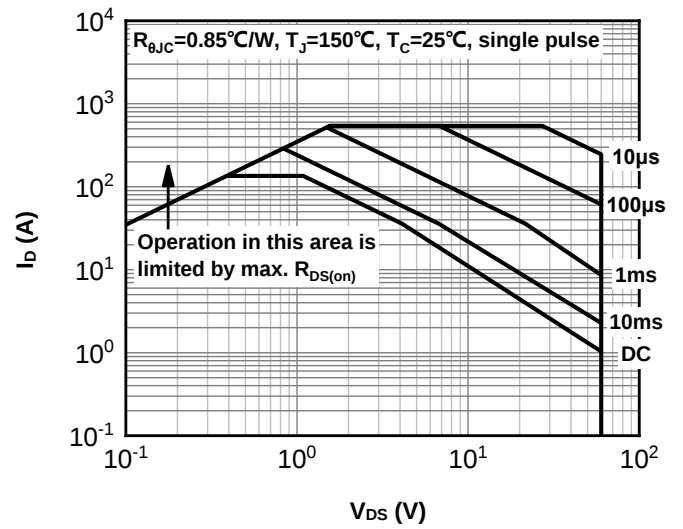


Fig.9 Typ. Capacitance

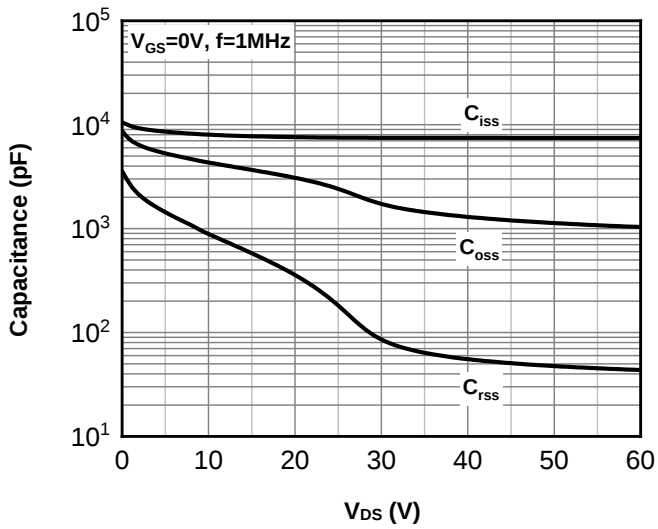


Fig.10 Single pulse maximum power dissipation

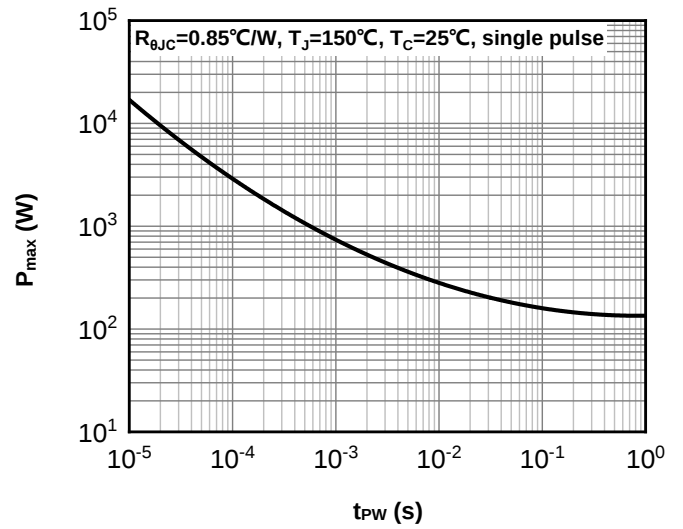


Fig.11 Max. power dissipation vs case temperature

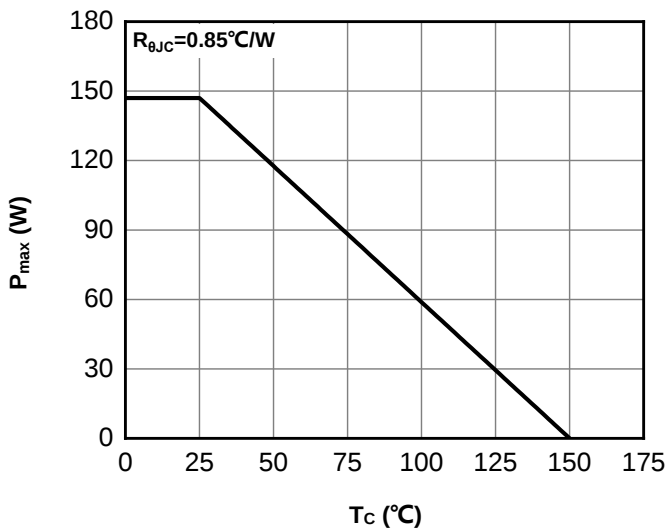
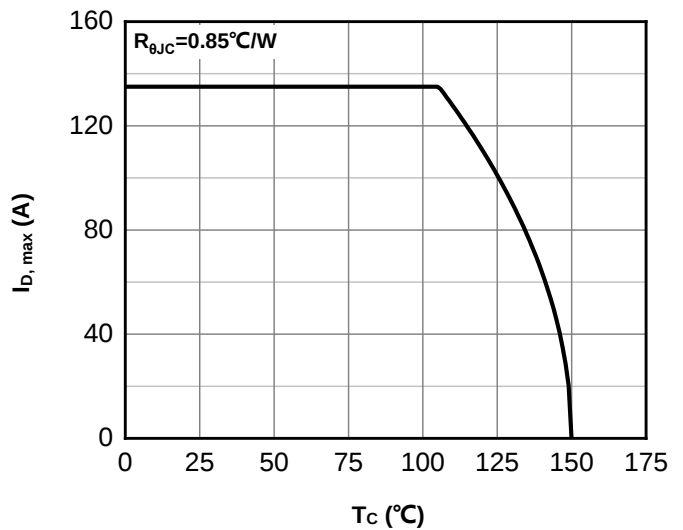
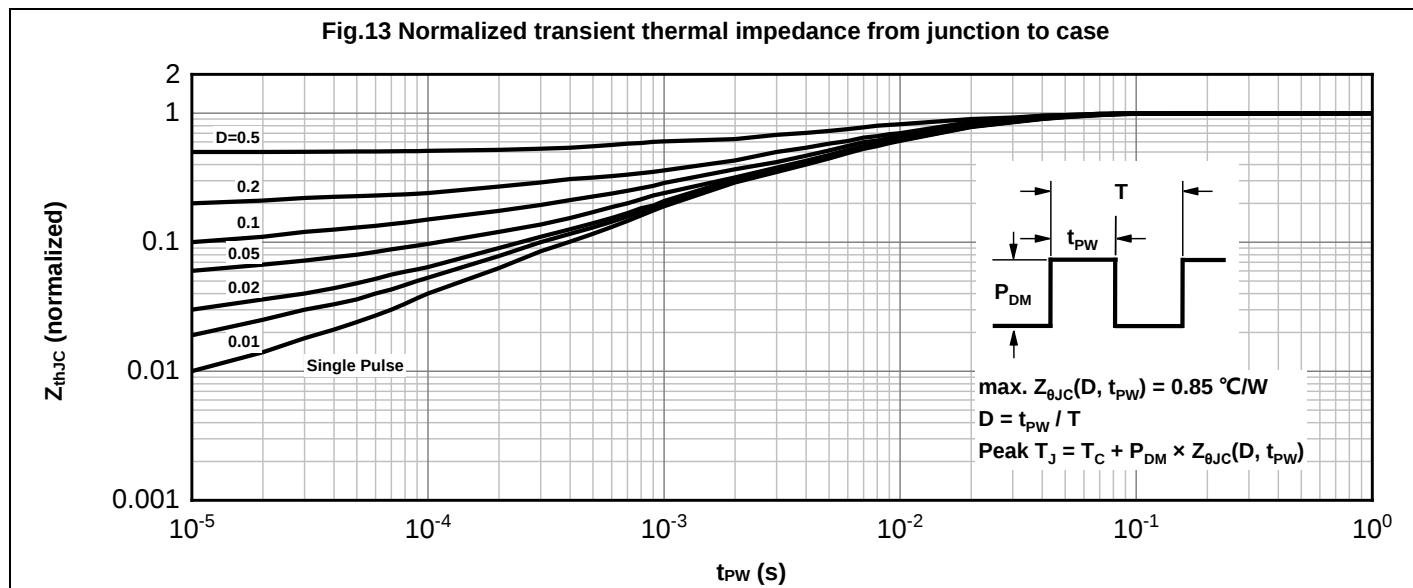


Fig.12 Max. continuous drain current vs case temperature



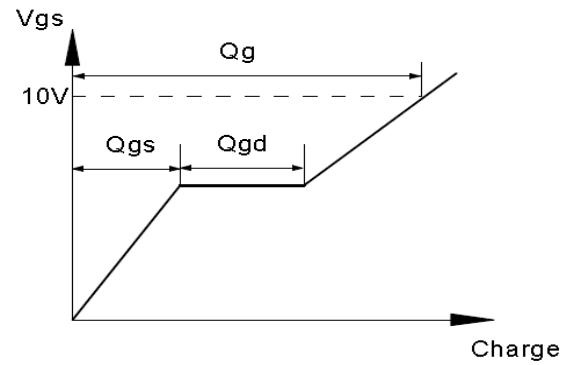
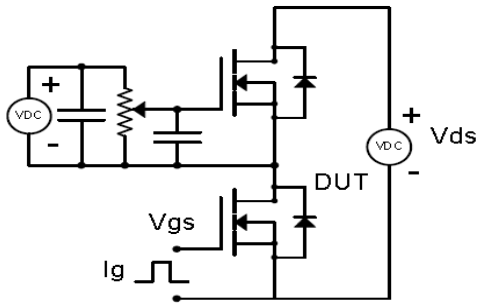
Typical Performance Characteristics

Fig.13 Normalized transient thermal impedance from junction to case

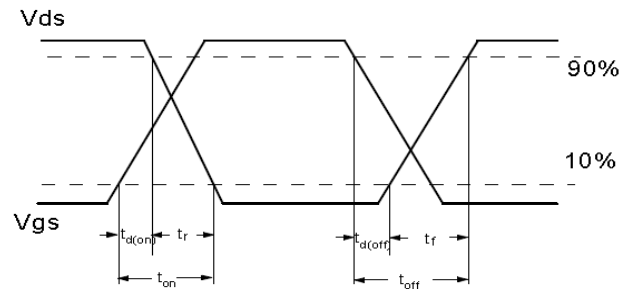
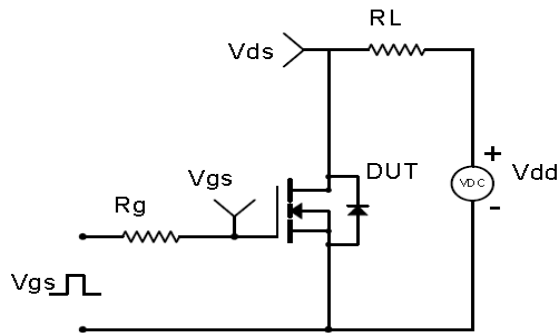


Test Circuit & Waveform

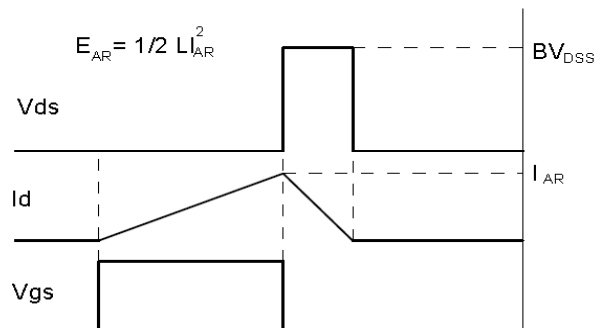
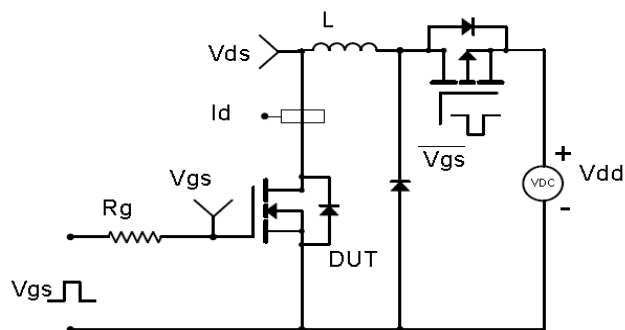
Gate Charge Test Circuit & Waveform



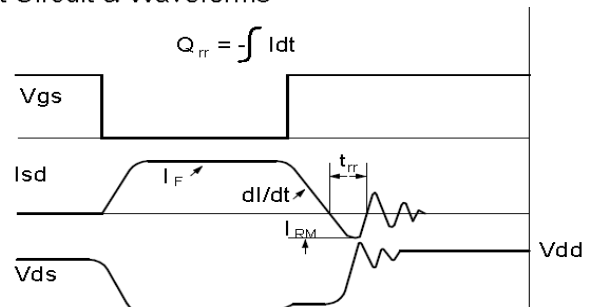
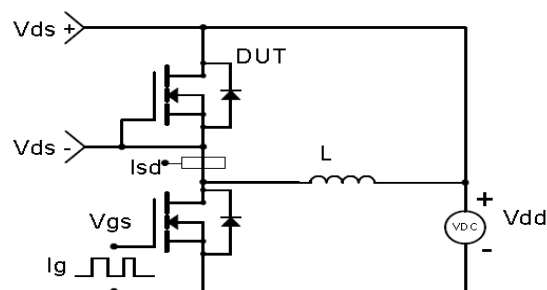
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

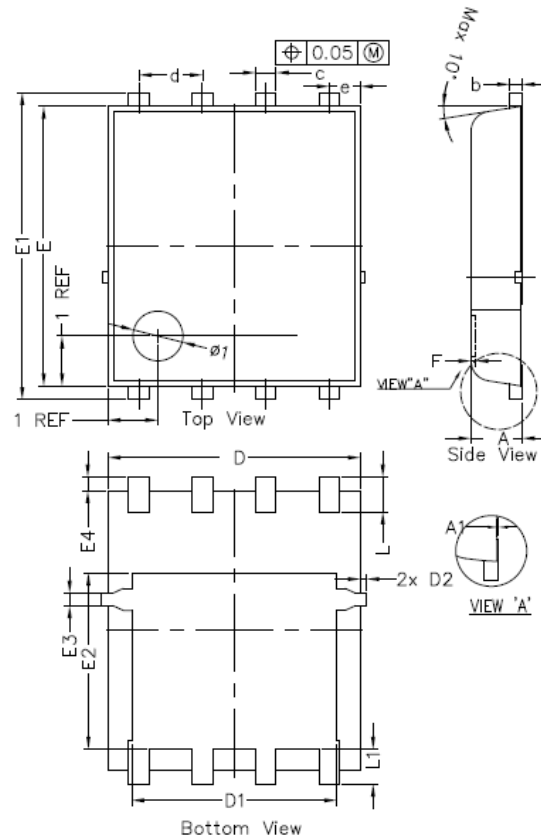


Diode Recovery Test Circuit & Waveforms





Outline Drawing PDFN5X6-8L



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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