

Product Summary

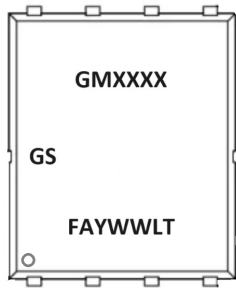
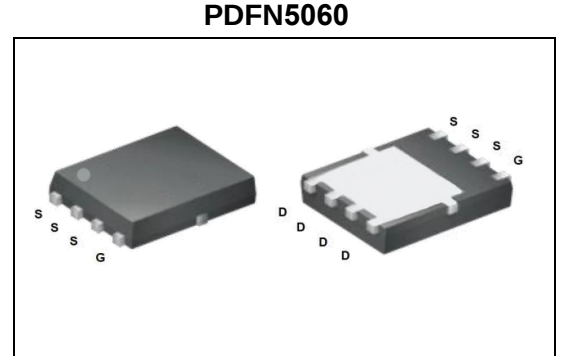
V_{DS} (V)	$R_{DS(on),max}$ (mΩ)	I_D (A)
30	6.4 @ $V_{GS} = 10V$	61 ⁽¹⁾

Features

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

Application

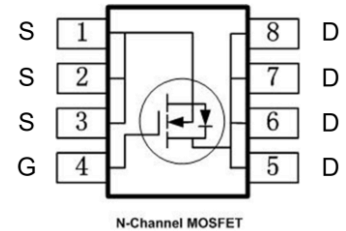
- DC/DC conversion
- Power switch
- PWM Application



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

Equivalent circuit



Absolute maximum rating@25°C

Parameter		Symbol	Limit	Unit
Drain-source voltage		V _{DS}	30	V
Gate-source voltage		V _{GS}	±20	
Continuous drain current	T _C =25°C ⁽¹⁾	I _D	61	A
	T _C =100°C ⁽¹⁾		39	
Pulsed drain current ⁽²⁾		I _{D,pulse}	240	
Avalanche energy, single pulse ⁽³⁾		E _{AS}	34	mJ
Power dissipation	T _C =25°C	P _D	42	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	$R_{\theta JC}$	3.0	°C/W
Thermal resistance, junction-to-ambient ⁽⁴⁾	$R_{\theta JA}$	58	

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	30			V
Gate-source threshold voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA	1.0	1.5	2.2	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} = 30 V, V _{GS} = 0 V			1	μA
Drain-source on-resistance	R _{DS(on)}	V _{GS} = 10 V, I _D = 30 A		5.1	6.4	mΩ
	R _{DS(on)}	V _{GS} = 4.5 V, I _D = 30 A		6.8	7.2	mΩ
Gate resistance	R _g	f = 1 MHz		3.6		Ω
Dynamic ⁽⁵⁾						
Total gate charge V _{GS} = 10V	Q _g	V _{DS} = 15 V, I _D = 20 A, V _{GS} = 10 V		9.0		nC
Gate-source charge	Q _{gs}			2.2		
Gate-drain charge	Q _{gd}			1.5		
Turn-on delay time	t _{d(on)}	V _{DS} = 15 V, I _D = 20 A, V _{GS} = 10 V, R _{GEN} = 3 Ω		5.4		ns
Rise time	t _r			11		
Turn-off delay time	t _{d(off)}			29		
Fall time	t _f			12		
Input capacitance	C _{iss}	V _{DS} = 15 V, V _{GS} = 0 V, f = 1 MHz		675		pF
Output capacitance	C _{oss}			242		
Reverse transfer capacitance	C _{rss}			11.4		
Reverse Diode Characteristics ⁽⁵⁾						
Diode forward voltage	V _{SD}	V _{GS} = 0 V, I _F = 2 A		0.7	1.0	V
Reverse recovery time	t _{rr}	I _F = 20 A, di/dt = 100 A/μs		26		ns
Reverse recovery charge	Q _{rr}			27		nC

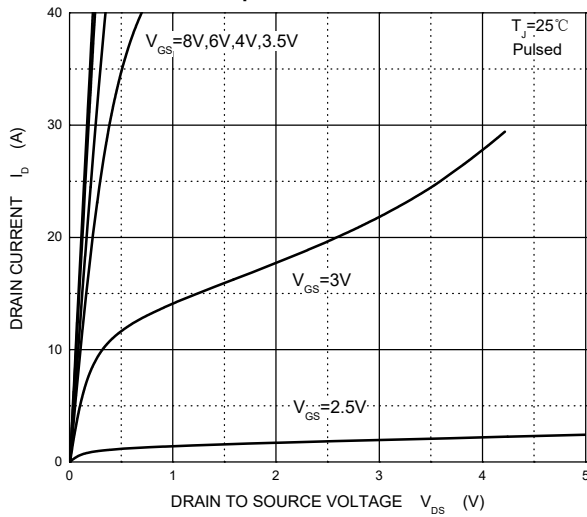
Notes

- (1) Limited by maximum junction temperature.
- (2) Pulse width limited by maximum junction temperature.
- (3) V_{DS} = 15 V, V_{GS} = 10 V, L = 0.3 mH.
- (4) Device mounted on FR-4 substrate PC board with 2oz copper in 1inch square cooling area.
- (5) Guaranteed by design, not subject to production testing.

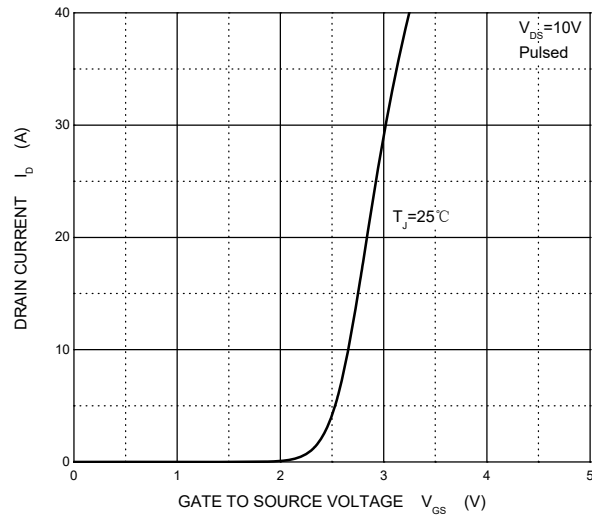


Typical Performance Characteristics

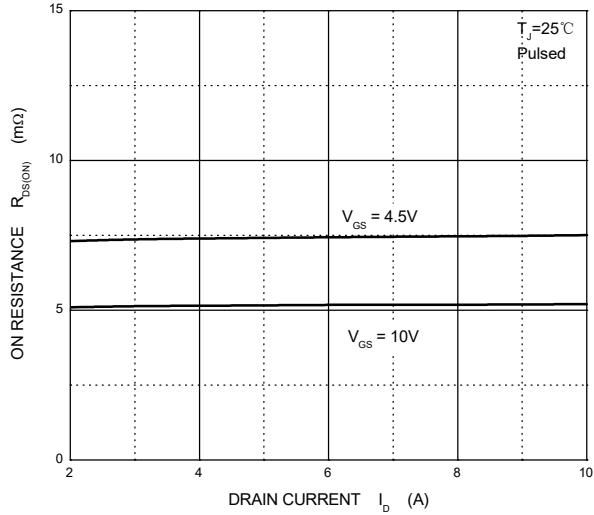
Output Characteristics



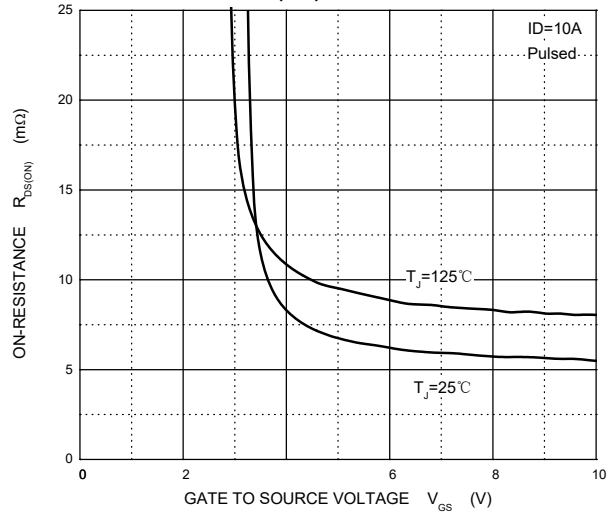
Transfer Characteristics



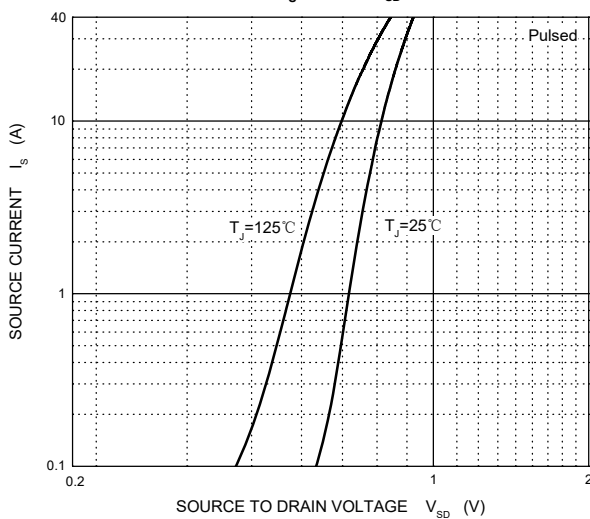
On Resistance vs. Drain Current



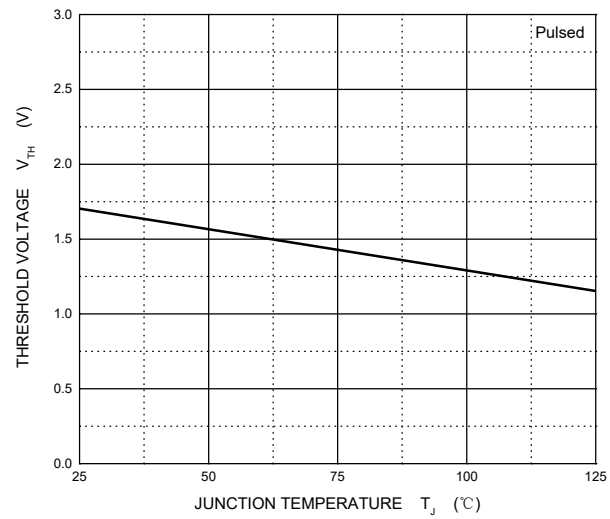
RDS(ON) — VGS



I_S — V_{SD}

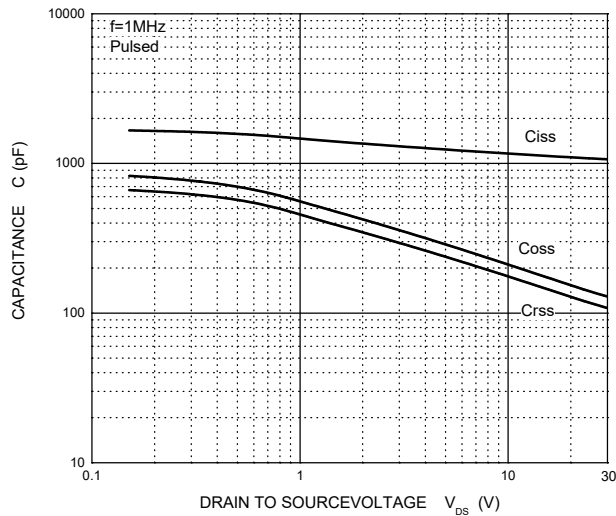


Threshold Voltage

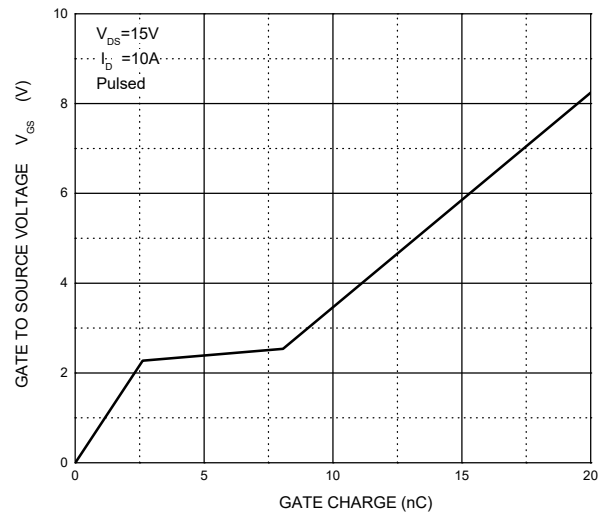


Typical Performance Characteristics

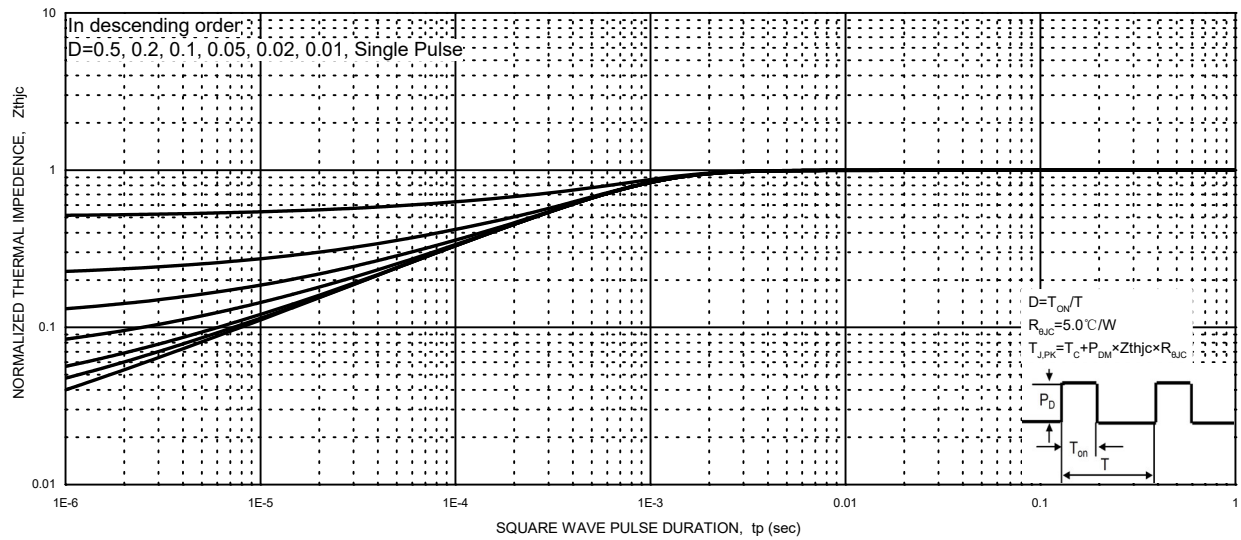
Capacitances



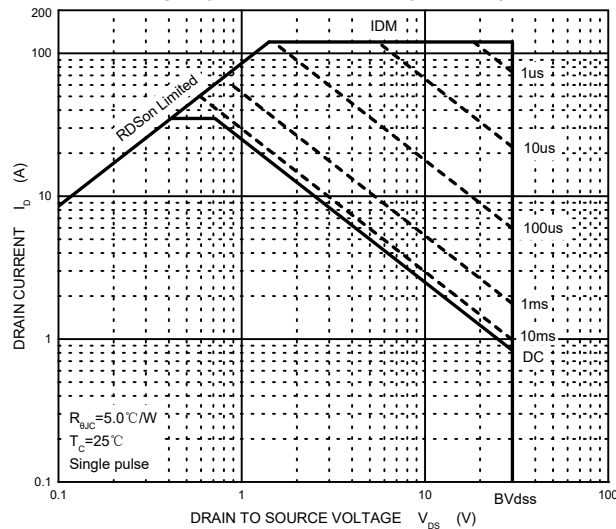
Gate Charge



NORMALIZED TRANSIENT THERMAL IMPEDANCE

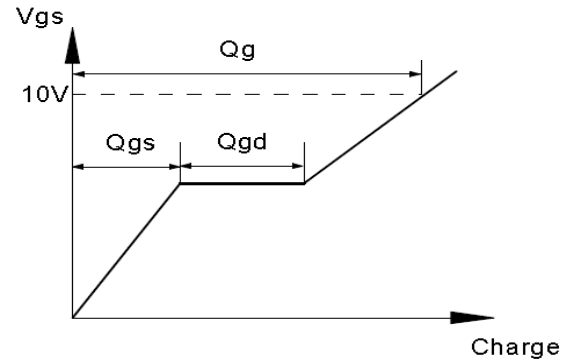
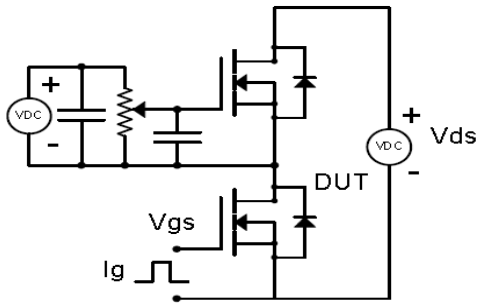


MAXIMUM FORWARD BIASED SAFE OPERATING AREA

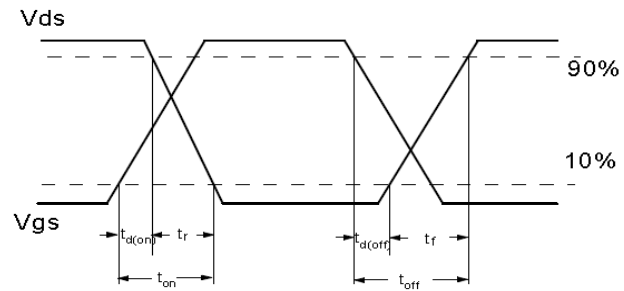
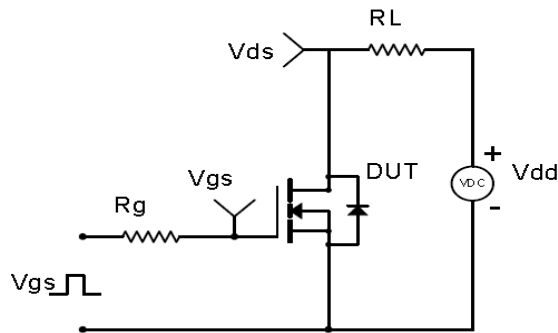


Test Circuit & Waveform

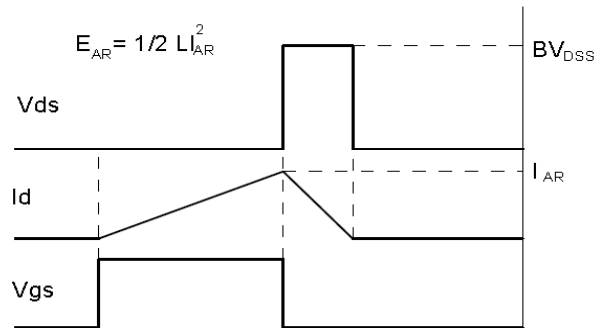
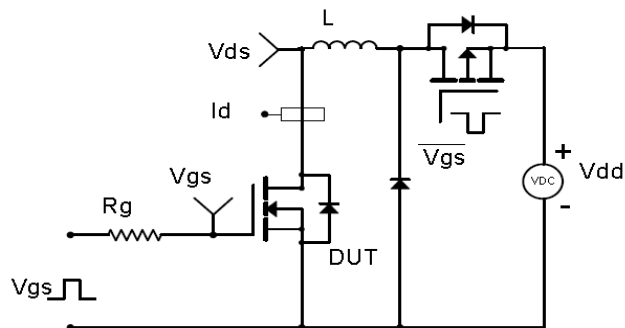
Gate Charge Test Circuit & Waveform



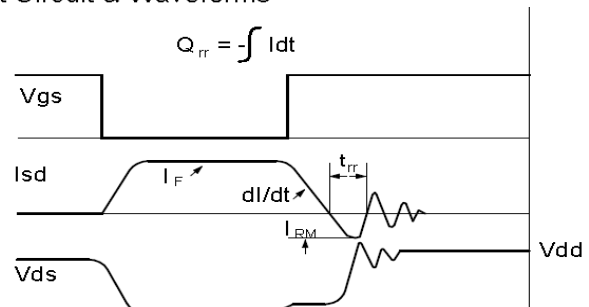
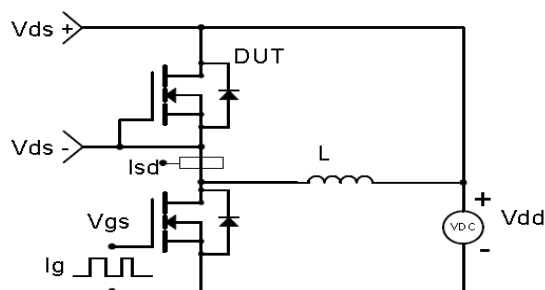
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

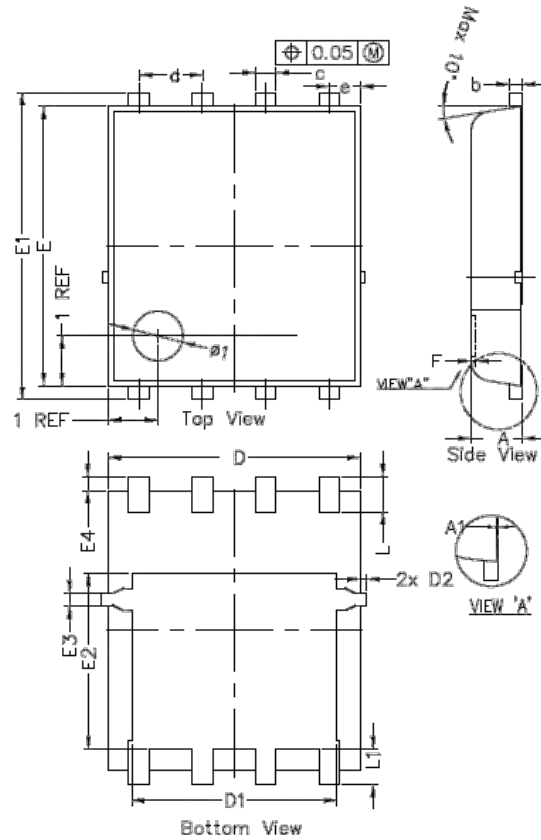


Diode Recovery Test Circuit & Waveforms





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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