

Product Summary

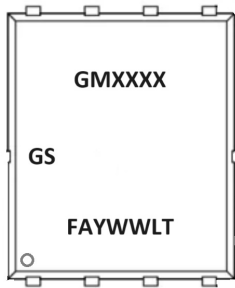
V_{DS} (V)	$R_{DS(on),max}$ (mΩ)	I_D (A)
30	4.8 @ $V_{GS} = 10V$	90 ⁽¹⁾

Features

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

Application

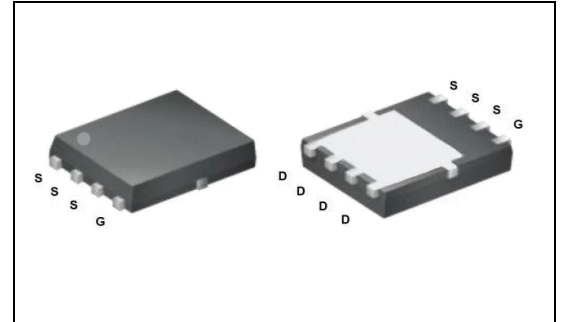
- DC/DC conversion
- Power switch
- PWM Application



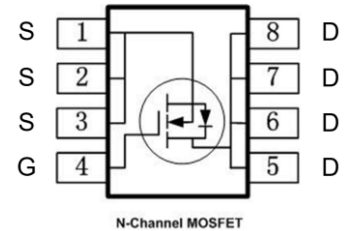
PDFN3333

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

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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	$T_C=25^{\circ}C^{(1)}$	90	A
	$T_C=100^{\circ}C^{(1)}$	58	
Pulsed drain current ⁽²⁾	$I_{D,pulse}$	360	
Avalanche energy, single pulse ⁽³⁾	E_{AS}	90	mJ
Power dissipation	$T_C=25^{\circ}C$	P_D	74.8 W
Operating junction and storage temperature range	T_J, T_{stg}	-55 to 150	°C

Thermal Characteristic

Parameter	Symbol	Typ.	Unit
Thermal resistance, junction-to-case	$R_{\theta JC}$	1.67	°C/W
Thermal resistance, junction-to-ambient ⁽⁴⁾	$R_{\theta JA}$	46	

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		3.6	4.8	mΩ
	R _{DS(on)}	V _{GS} = 4.5 V, I _D = 30 A		5.7	7.0	mΩ
Gate resistance	R _g	f = 1 MHz		4.2		Ω
Dynamic ⁽⁵⁾						
Total gate charge V _{GS} = 10V	Q _g	V _{DS} = 15 V, I _D = 30 A, V _{GS} = 10 V		42		nC
Gate-source charge	Q _{gs}			4		
Gate-drain charge	Q _{gd}			14		
Turn-on delay time	t _{d(on)}	V _{DS} = 15 V, I _D = 30 A, V _{GS} = 10 V, R _{GEN} = 3 Ω		13		ns
Rise time	t _r			26		
Turn-off delay time	t _{d(off)}			43		
Fall time	t _f			16		
Input capacitance	C _{iss}	V _{DS} = 15 V, V _{GS} = 0 V, f = 1 MHz		1950		pF
Output capacitance	C _{oss}			240		
Reverse transfer capacitance	C _{rss}			215		
Reverse Diode Characteristics ⁽⁵⁾						
Diode forward voltage	V _{SD}	V _{GS} = 0 V, I _F = 2 A		0.7	1.2	V
Reverse recovery time	t _{rr}	I _F = 20 A, di/dt = 100 A/μs		16		ns
Reverse recovery charge	Q _{rr}			5		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 = 0.5 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

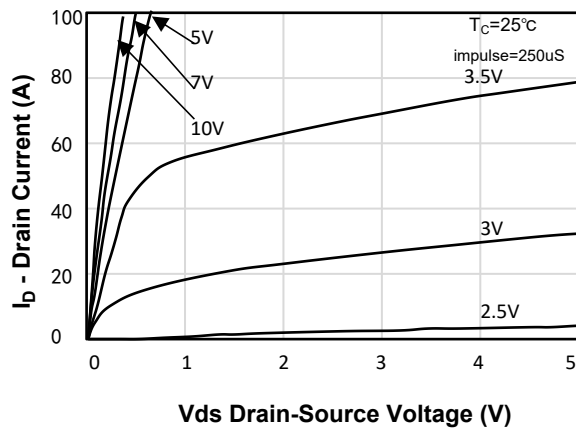


Figure 1. On-Region Characteristics

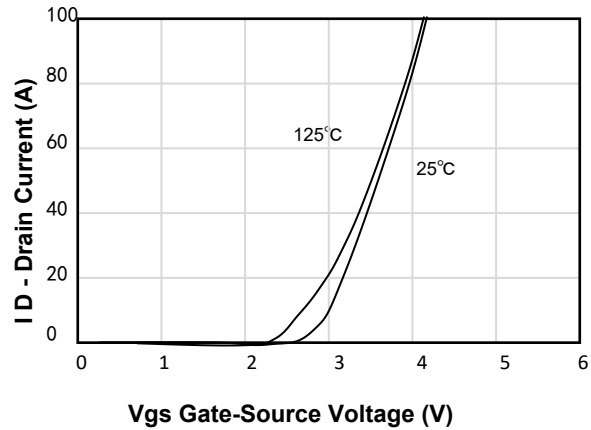


Figure 2. Transfer Characteristics

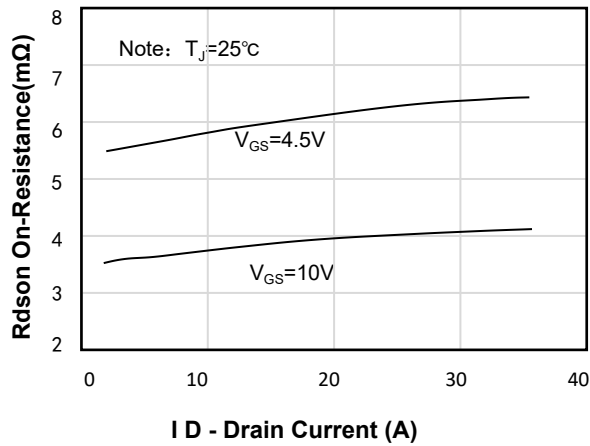


Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

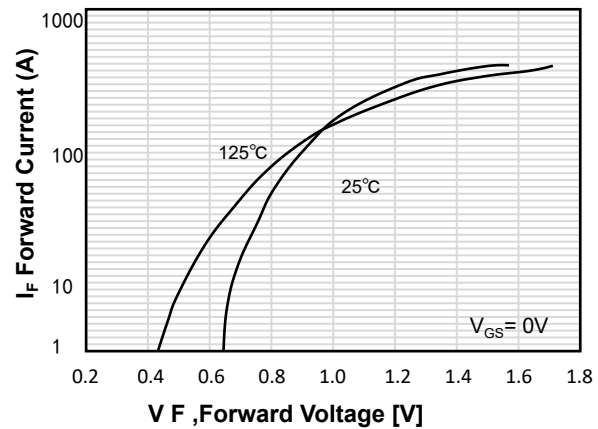


Figure 4. Body Diode Forward Voltage Variation with Source Current and Temperature

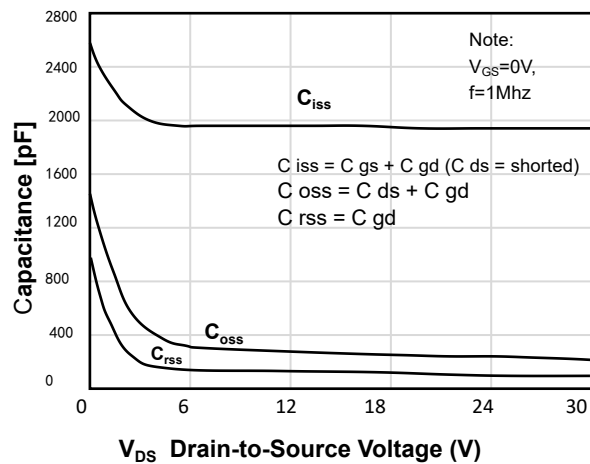


Figure 5. Capacitance Characteristics

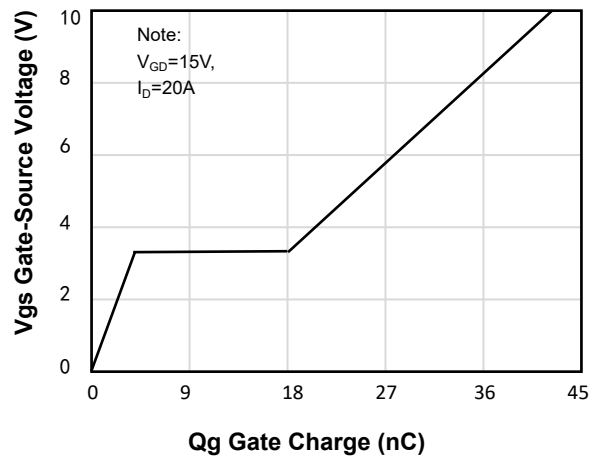


Figure 6. Gate Charge Characteristics

Typical Performance Characteristics

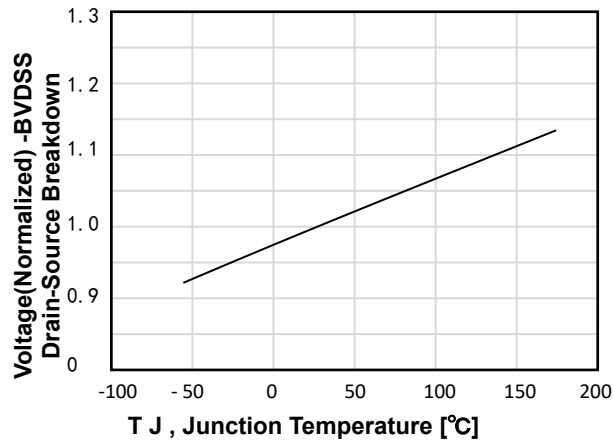


Figure 7. Breakdown Voltage Variation vs Temperature

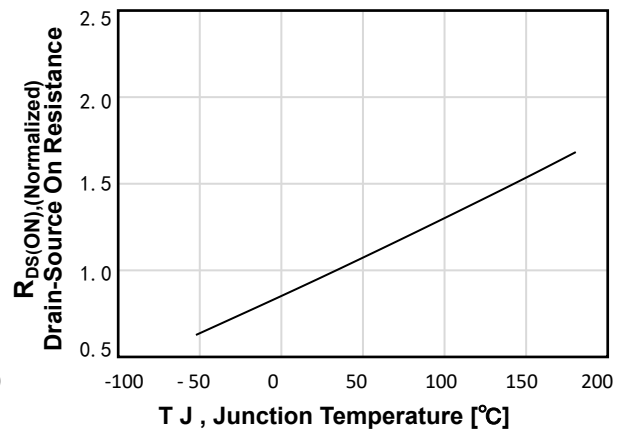


Figure 8. On-Resistance Variation vs Temperature

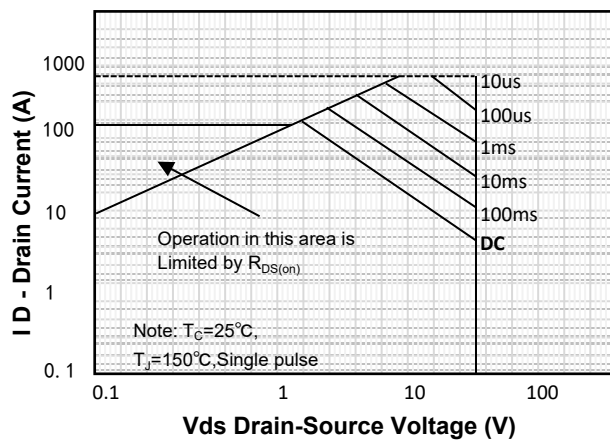


Figure 9. Maximum Safe Operating Area

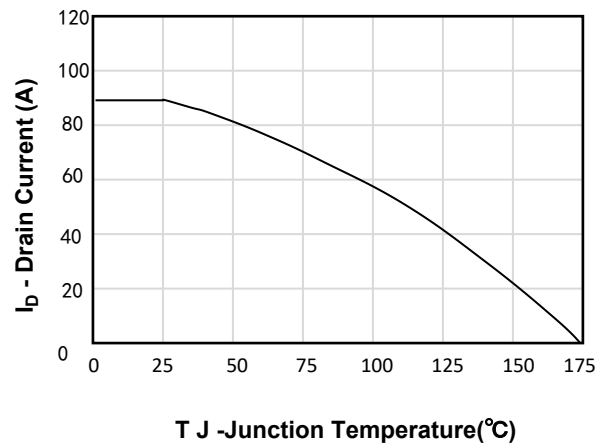


Figure 10. Maximum Continuous Drain Current vs Temperature

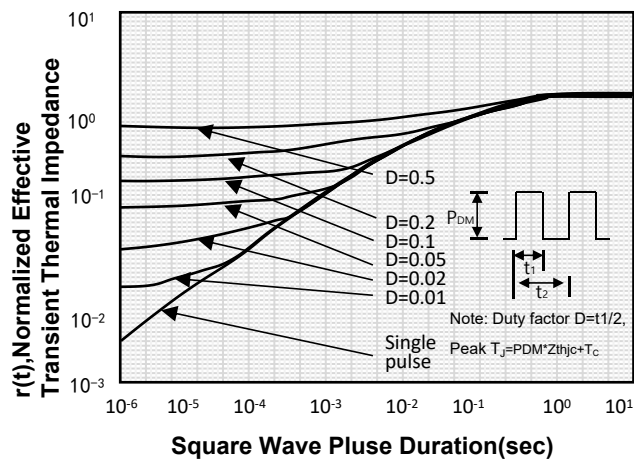
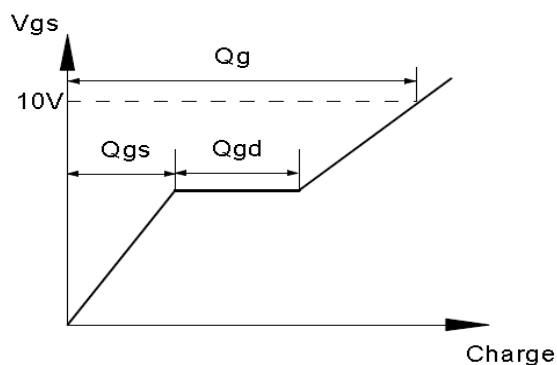
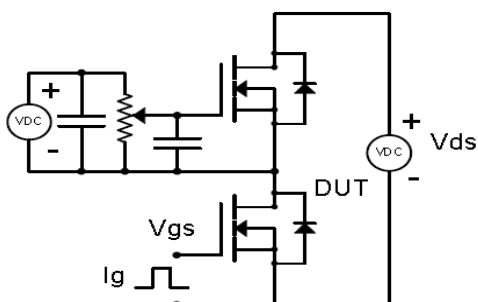


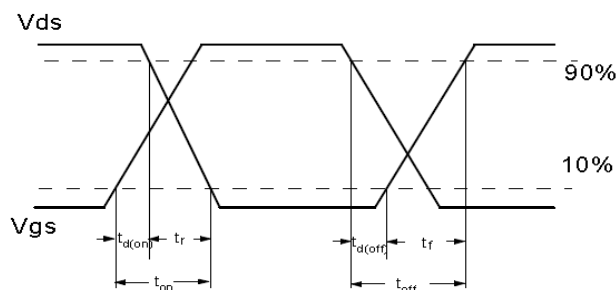
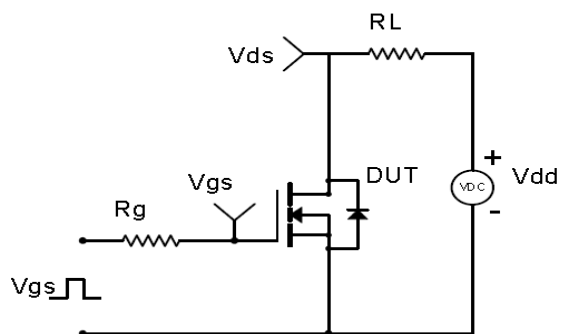
Figure 11. Transient Thermal Response Curve

Test Circuit & Waveform

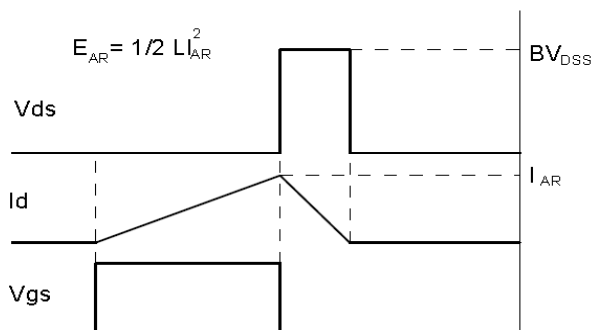
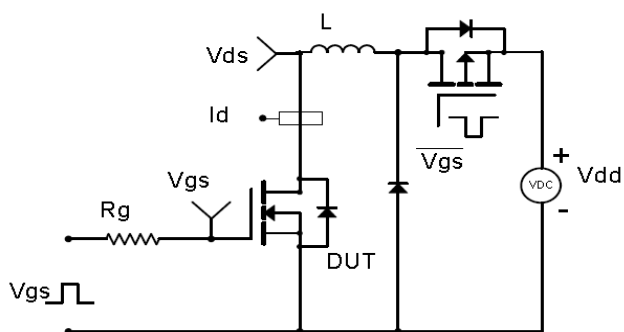
Gate Charge Test Circuit & Waveform



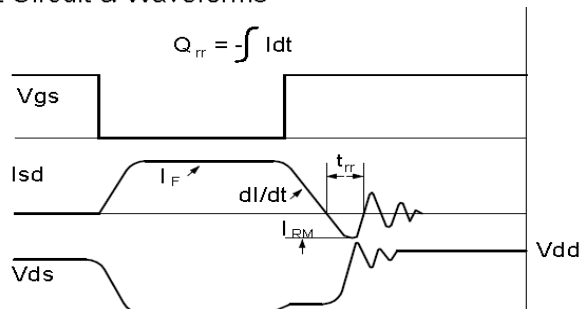
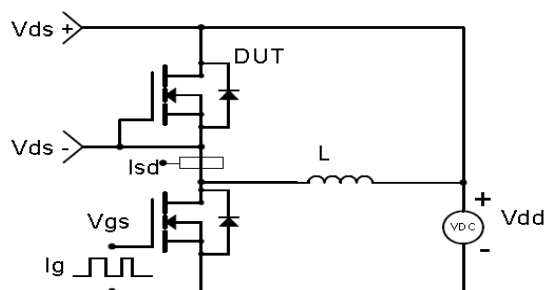
Resistive Switching Test Circuit & Waveforms



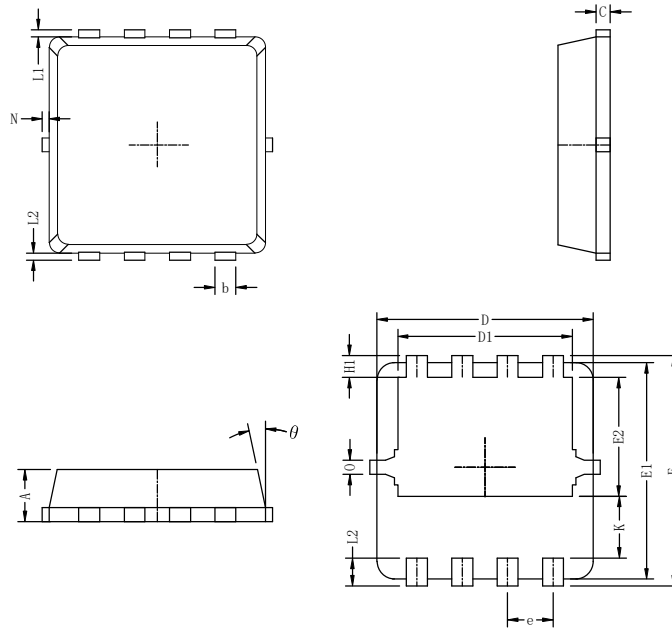
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Outline Drawing PDFN3333



Symbols	Millimeters		
	MIN.	NOM.	MAX.
A	0.65	0.75	0.85
b	0.25	0.30	0.35
C	0.15	0.20	0.25
D	3.00	3.10	3.20
D1	2.40	2.50	2.60
E	3.20	3.30	3.40
E1	3.00	3.10	3.20
E2	1.60	1.70	1.80
e	0.65 BSC.		
H1	0.21	0.31	0.41
H2	0.30	0.40	0.50
K	0.78	0.88	0.98
L1/L2	0.10 REF.		
θ	11°	12°	13°
N	0	-	0.15
O	0.2 REF.		

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