

Product Summary

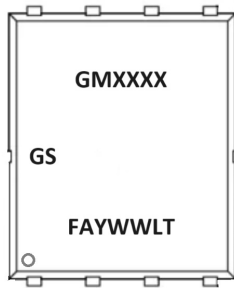
V_{DS} (V)	$R_{DS(on),max}$ (mΩ)	I_D (A)
30	8.8 @ $V_{GS} = 10V$	50 ⁽¹⁾

Features

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

Application

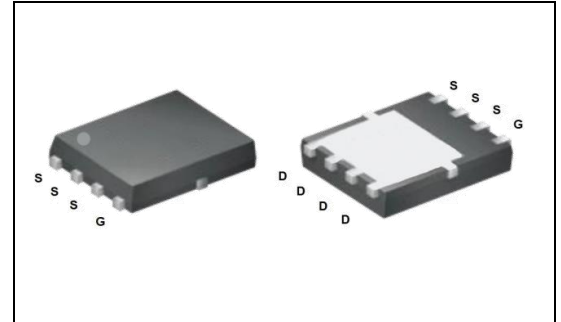
- High Frequency Point-of-Load Synchronous Buck Converter for MB/NB/UMPC/VGA
- Networking DC-DC Power System
- Load Switch



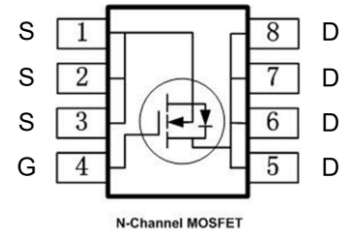
PDFN3333

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°C ⁽¹⁾	I _D	50	A
	T _C =100°C ⁽¹⁾		37	
Pulsed drain current ²		I _{D,pulse}	100	
Avalanche energy, single pulse ³		E _{AS}	50	mJ
Power dissipation ⁴	T _C =25°C	P _D	26	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 ¹	$R_{\theta JC}$	4.7	°C/W
Thermal resistance, junction-to-ambient ¹	$R_{\theta JA}$	70	

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	1.1	1.5	1.9	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 = 30 A		6.3	8.8	mΩ
	R _{DS(on)}	V _{GS} = 4.5 V, I _D = 30 A		8.2	11	mΩ
Forward transconductance ⁽⁵⁾	g _{fs}	V _{DS} = 5 V, I _D = 30 A		40		S
Gate resistance	R _g	f = 1 MHz		1.0		Ω
Dynamic ⁽⁵⁾						
Total gate charge V _{GS} = 10V	Q _g	V _{DS} = 15 V, I _D = 15 A, V _{GS} = 10 V		10		nC
Gate-source charge	Q _{gs}			3.5		
Gate-drain charge	Q _{gd}			4.2		
Turn-on delay time	t _{d(on)}	V _{DS} = 15 V, I _D = 1 A, V _{GS} = 10 V, R _{GEN} = 6 Ω		9		ns
Rise time	t _r			11		
Turn-off delay time	t _{d(off)}			29		
Fall time	t _f			7		
Input capacitance	C _{iss}	V _{DS} = 15 V, V _{GS} = 0 V, f = 1 MHz		1200		pF
Output capacitance	C _{oss}			185		
Reverse transfer capacitance	C _{rss}			113		
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 = 15 A, di/dt = 100 A/μs		15		ns
Reverse recovery charge	Q _{rr}			7		nC

Notes

1. The data tested by surface mounted on a 1 inch² FR-4 board with 20Z copper, t_s ≤ 10sec.
2. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%
3. The E_{AS} data shows Max. rating . The test condition is V_{DD}=25V, V_{GS}=10V, L=0.1mH, I_{AS}=20A
4. The power dissipation is limited by 150°C junction temperature.
5. Guaranteed by design, not subject to production testing.

Typical Performance Characteristics

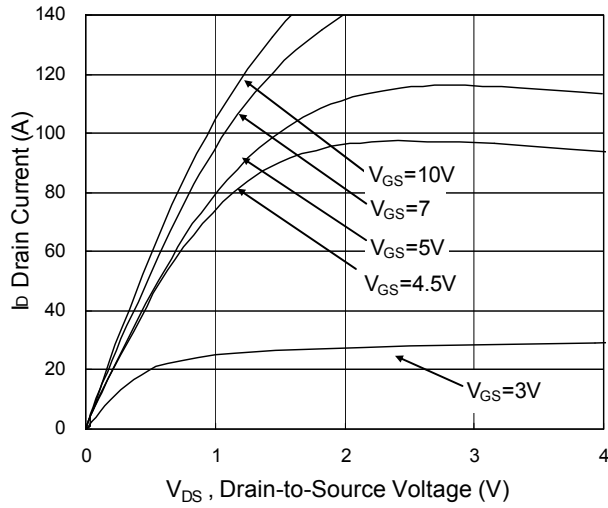


Fig.1 Typical Output Characteristics

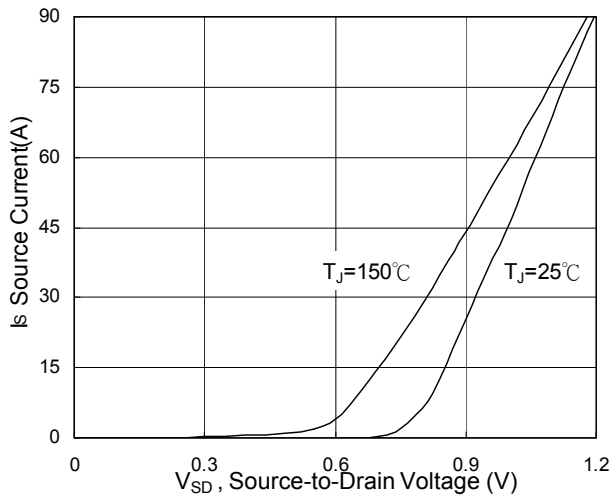


Fig.3 Forward Characteristics of Reverse

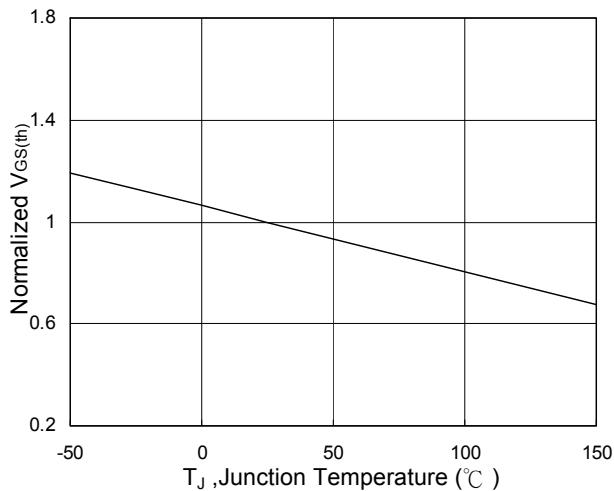


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

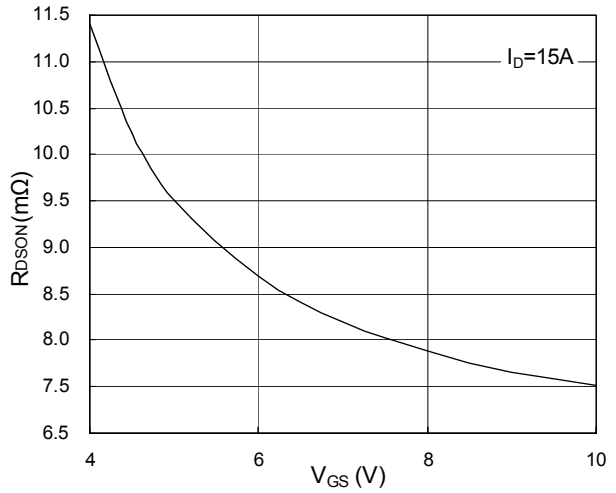


Fig.2 On-Resistance vs. Gate-Source

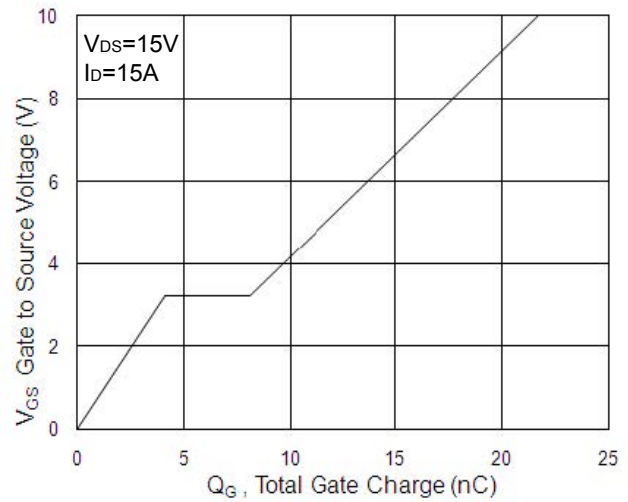


Fig.4 Gate-Charge Characteristics

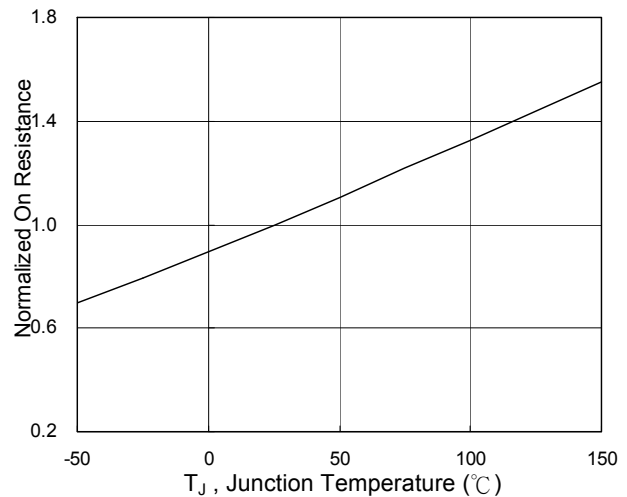


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

Typical Performance Characteristics

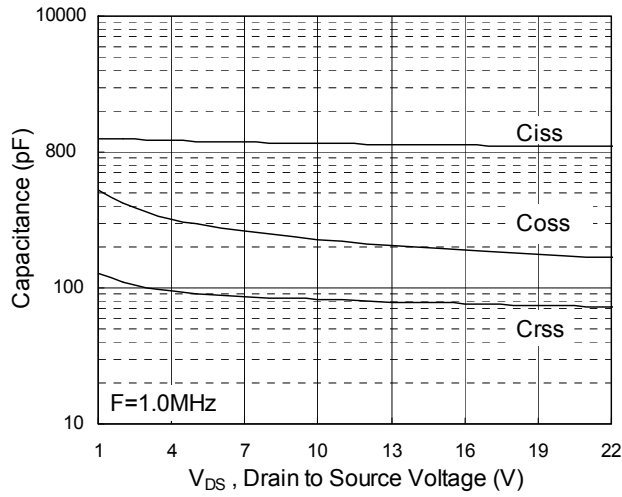


Fig.7 Capacitance

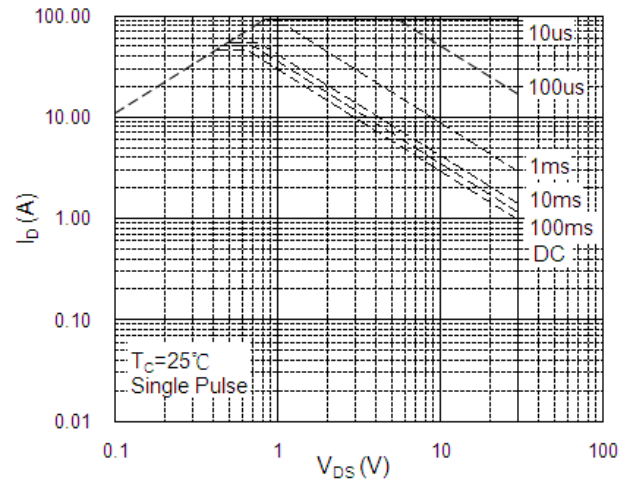


Fig.8 Safe Operating Area

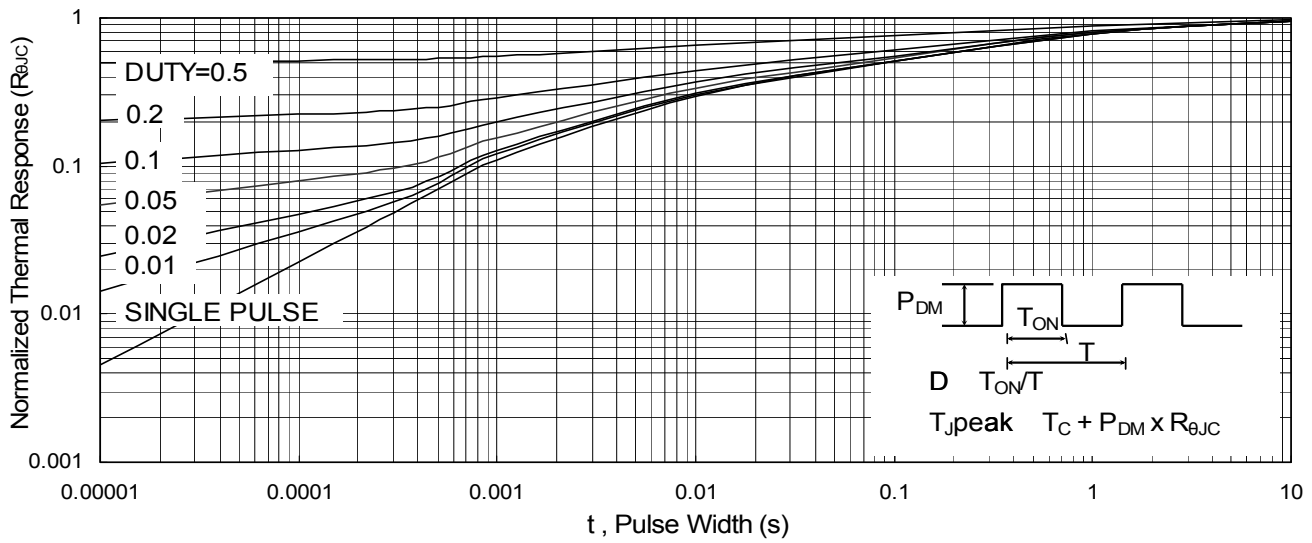
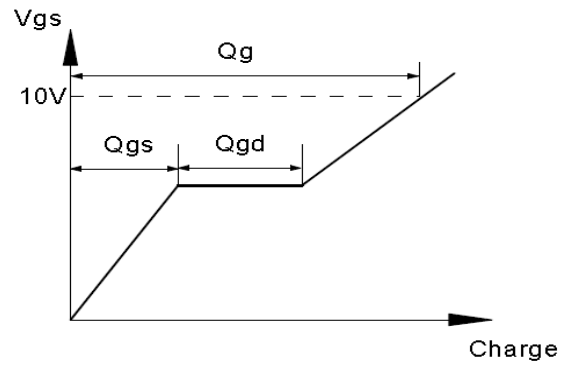
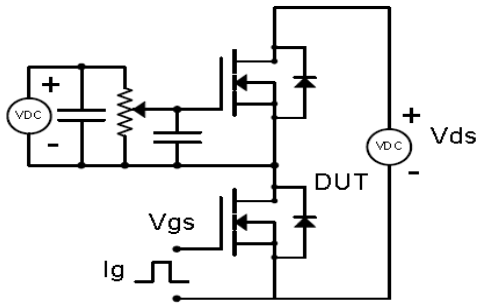


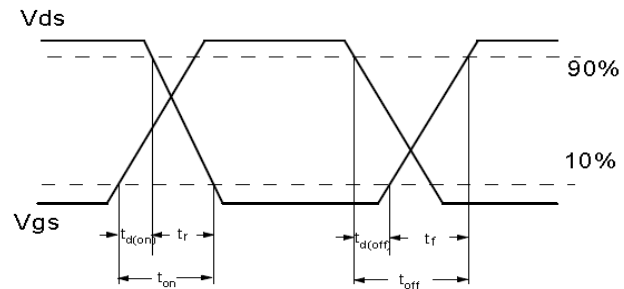
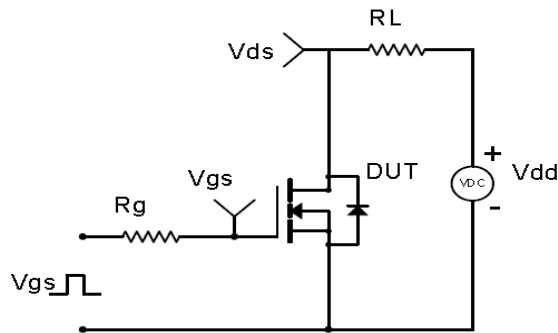
Fig.9 Normalized Maximum Transient Thermal Impedance

Test Circuit & Waveform

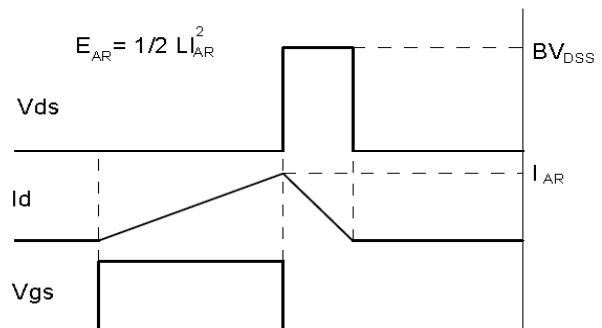
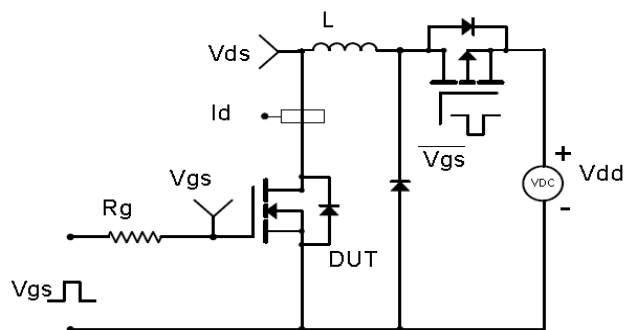
Gate Charge Test Circuit & Waveform



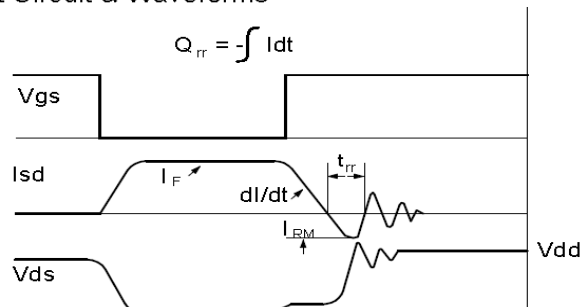
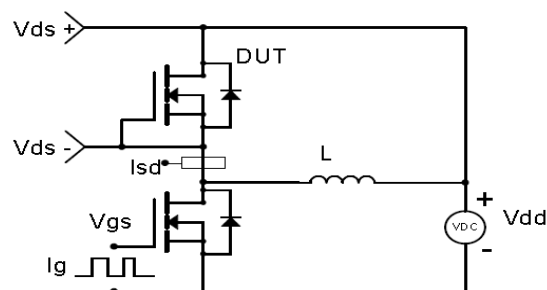
Resistive Switching Test Circuit & Waveforms



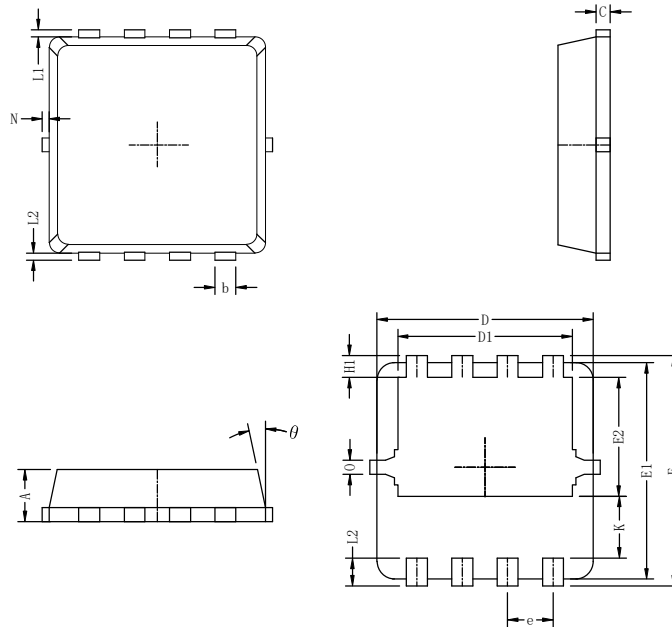
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Outline Drawing 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
0	0.2 REF.		

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