

Product Summary

V_{DS} (V)	$R_{DS(on),max}$ (mΩ)	I_D (A)
30	6.4 @ $V_{GS} = 10V$	43 ⁽¹⁾

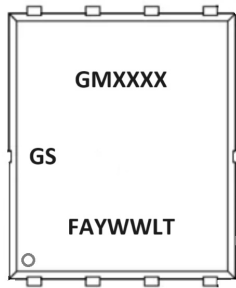
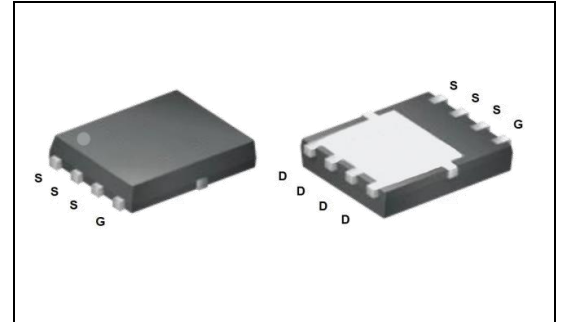
Features

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

Application

- DC/DC conversion
- Power switch
- PWM Application

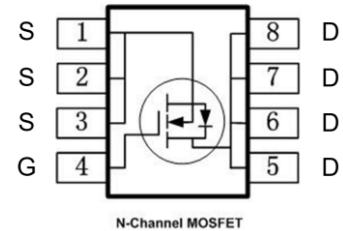
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PDFN3333

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

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	$T_C=25^{\circ}C^{(1)}$	43	A
	$T_C=100^{\circ}C^{(1)}$	27	
Pulsed drain current ⁽²⁾	$I_{D,pulse}$	125	
Avalanche energy, single pulse ⁽³⁾	E_{AS}	9.5	mJ
Power dissipation	$T_C=25^{\circ}C$	P_D	19.2 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	$R_{\theta JC}$	6.5	°C/W
Thermal resistance, junction-to-ambient ⁽⁴⁾	$R_{\theta JA}$	60	

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		4.7	6.4	mΩ
	R _{DS(on)}	V _{GS} = 4.5 V, I _D = 30 A		6.5	7.2	mΩ
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 = 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		46		ns
Reverse recovery charge	Q _{rr}			37		nC

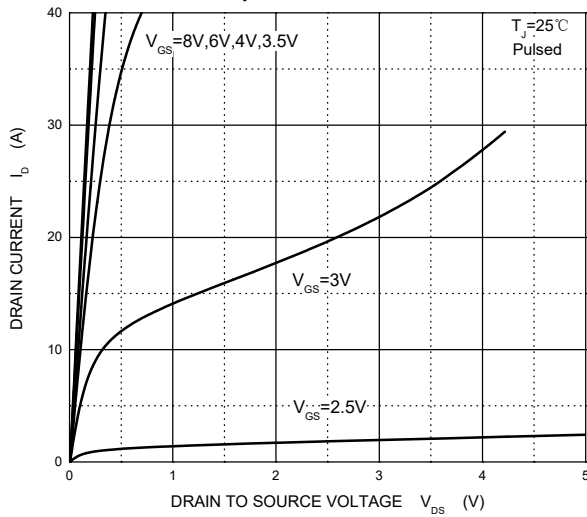
Notes

- (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.

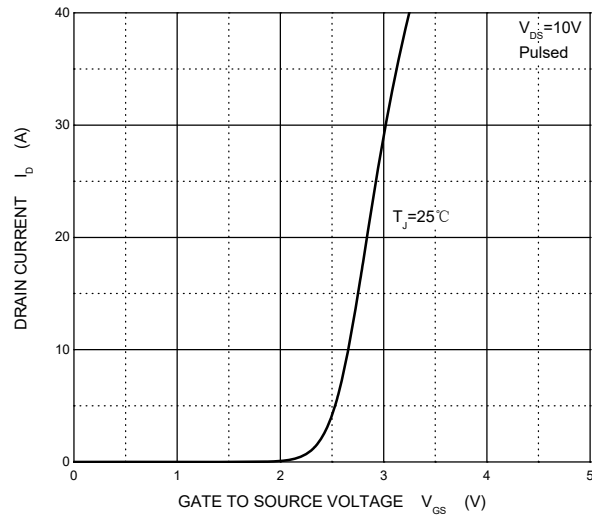


Typical Performance Characteristics

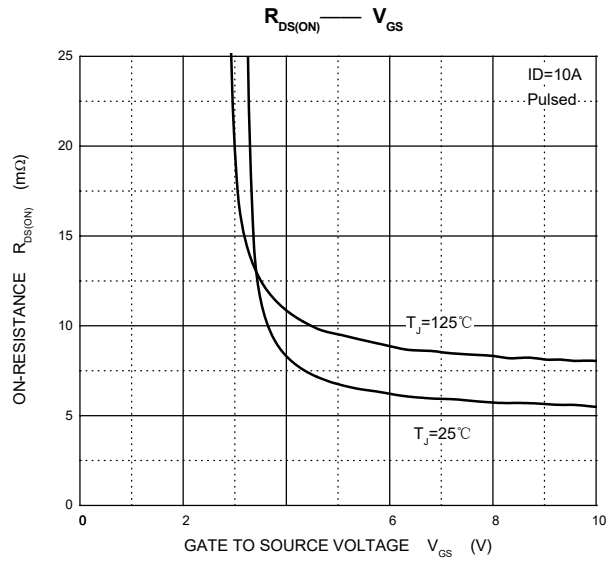
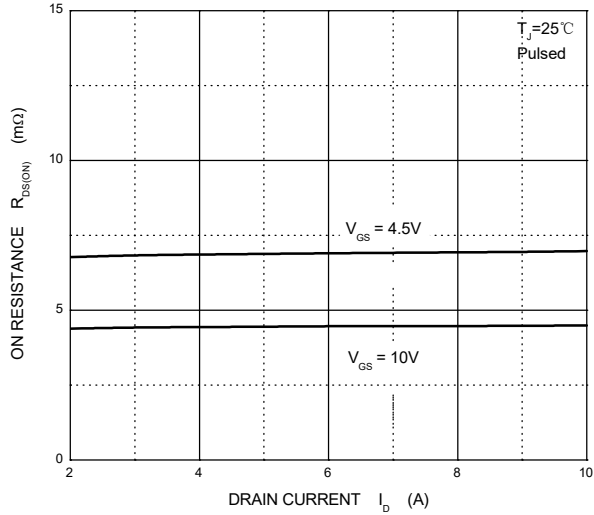
Output Characteristics



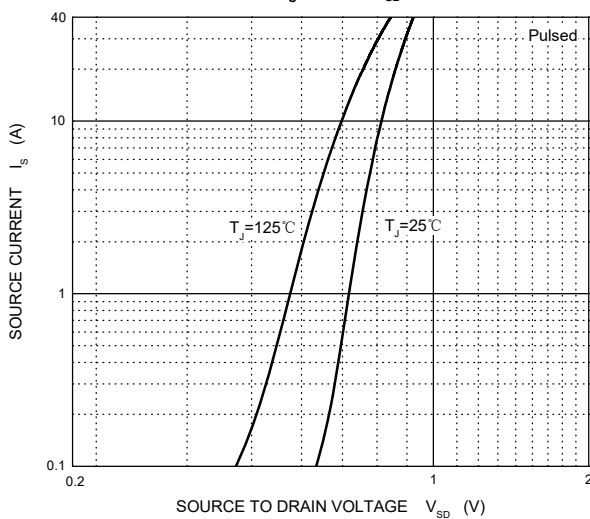
Transfer Characteristics



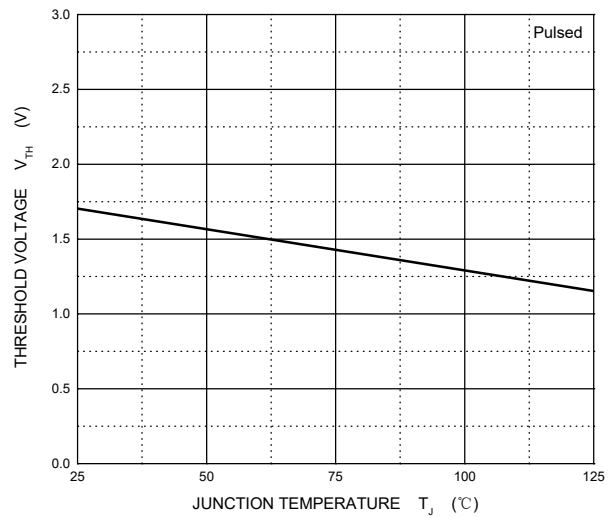
On Resistance vs. Drain Current



I_S — V_{SD}

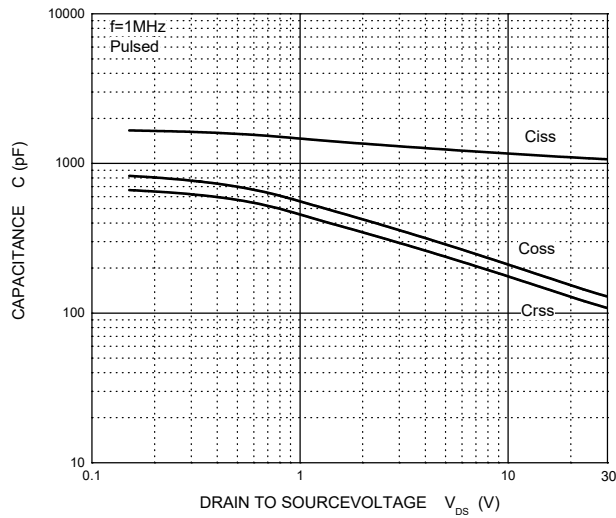


Threshold Voltage

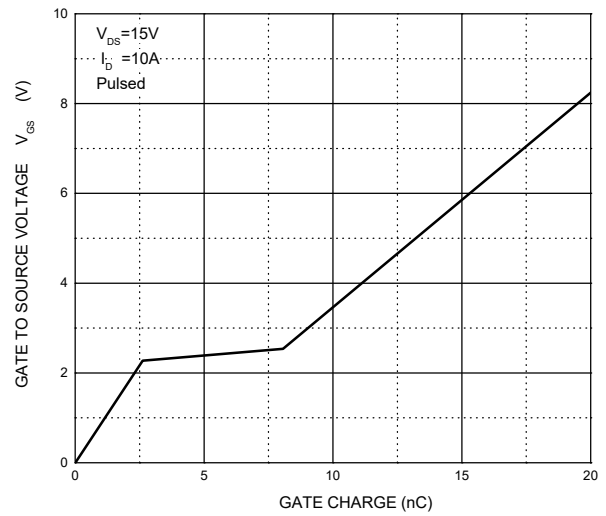


Typical Performance Characteristics

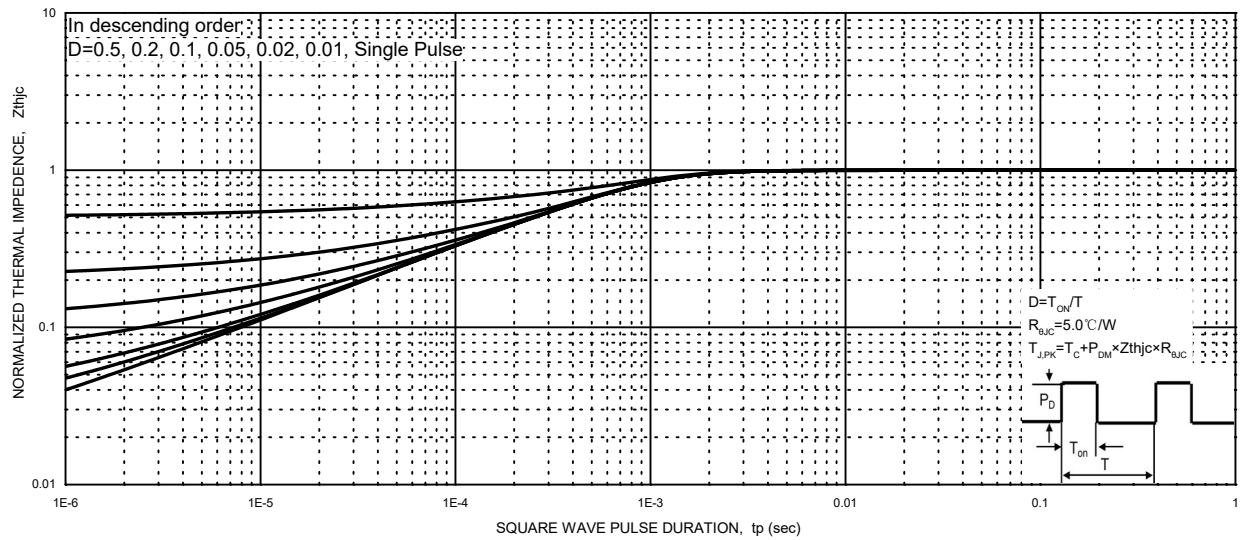
Capacitances



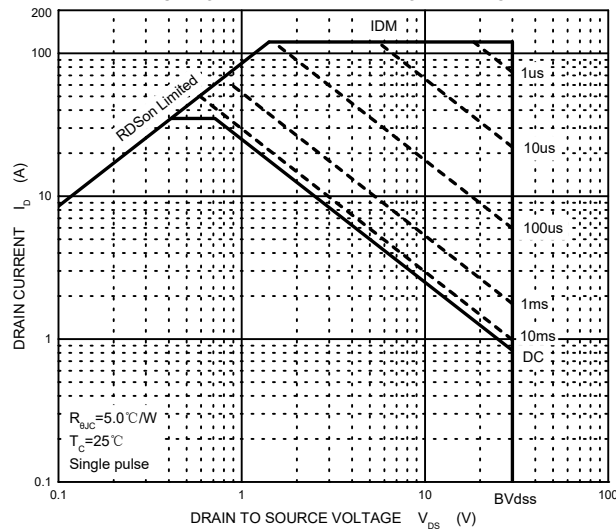
Gate Charge



NORMALIZED TRANSIENT THERMAL IMPEDANCE

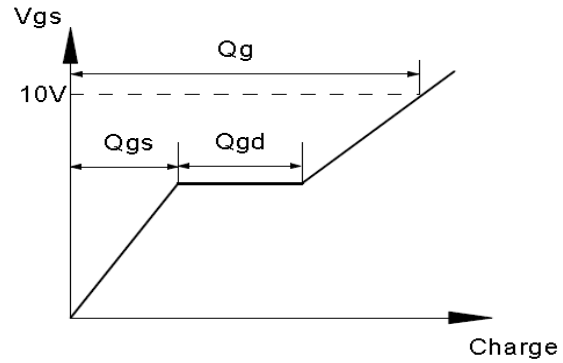
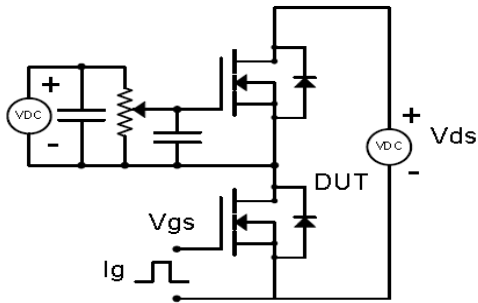


MAXIMUM FORWARD BIASED SAFE OPERATING AREA

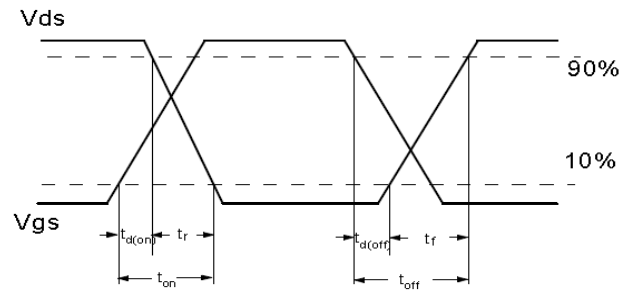
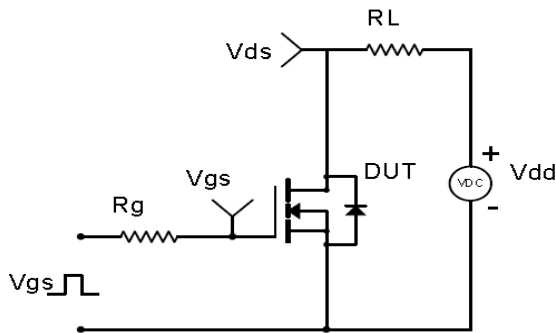


Test Circuit & Waveform

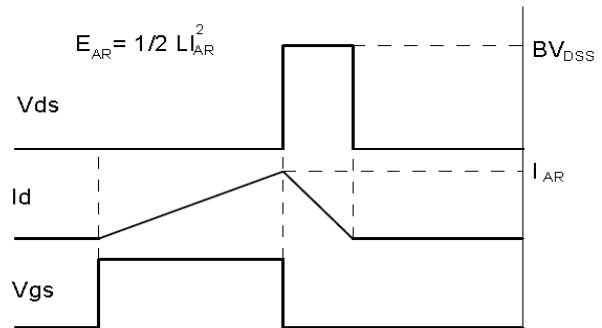
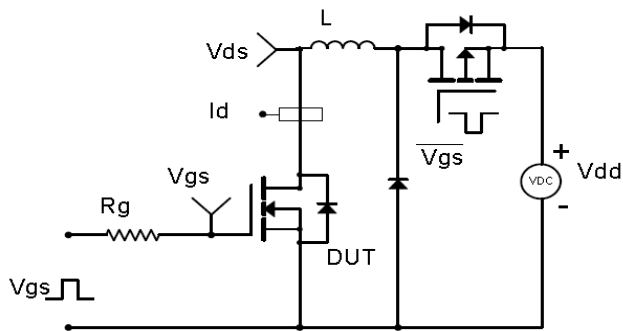
Gate Charge Test Circuit & Waveform



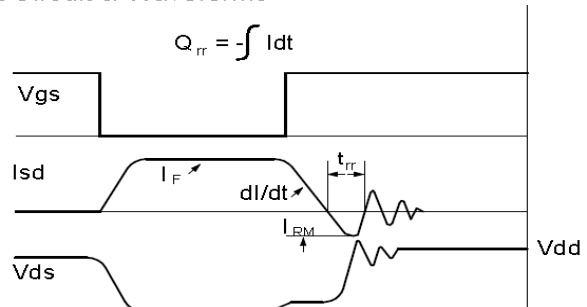
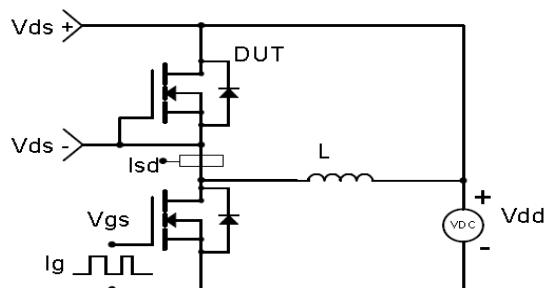
Resistive Switching Test Circuit & Waveforms



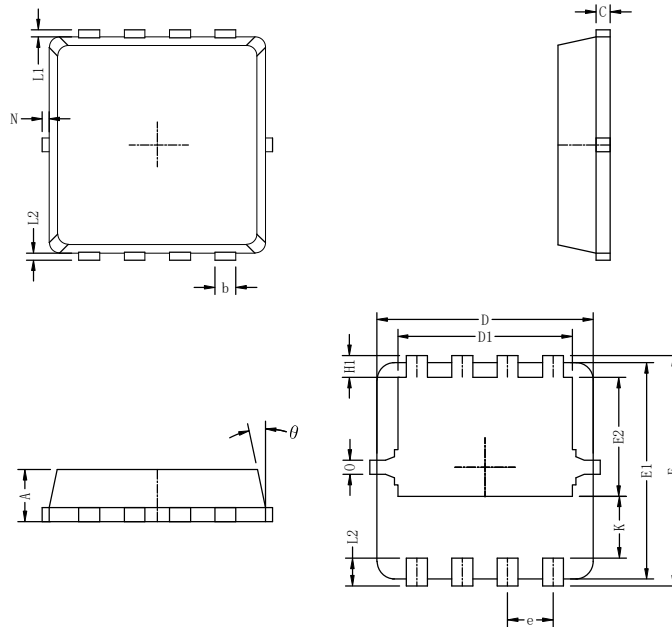
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Outline Drawing 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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