

Product Summary

V_{DS} (V)	$R_{DS(on),max}$ (mΩ)	I_D (A)
-30	7.8@ $V_{GS} = -10V$	-55

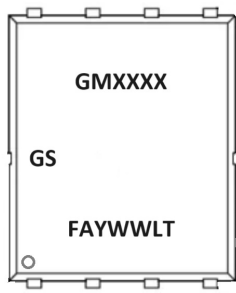
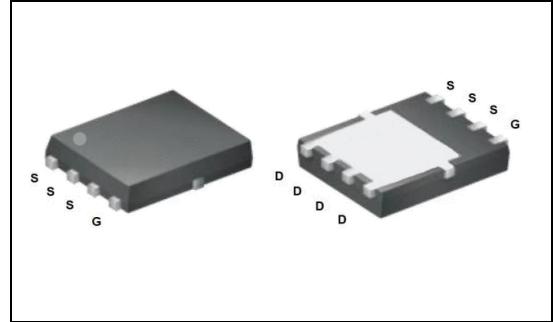
Features

- ❖ Fast Switching
- ❖ Low On-Resistance
- ❖ Low Gate Charge

Application

- ❖ Load Switch
- ❖ Battery protection
- ❖ Uninterruptible power supply

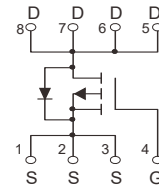
PDFN3030



PDFN3030

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 ($T_a=25^\circ\text{C}$)

Parameters		Symbol	Max	Units
Drain-Source Voltage		V_{DS}	-30	V
Gate-Source Voltage		V_{GS}	± 20	V
Continuous Drain Current ^G	$T_C = +25^\circ\text{C}$	I_D	-55	A
Pulsed Drain Current ^C		I_{DM}	-200	A
Avalanche Current ^C		I_{AS}	-24.5	A
Avalanche Energy ^C	$L=0.5\text{mH}$	E_{AS}	150	mJ
Power Dissipation ^B	$T_C = +25^\circ\text{C}$	P_D	52	W
Operating and Storage Temperature Range		T_J, T_G, T_{STG}	-55 to +150	$^\circ\text{C}$

Thermal Characteristic

Characteristic		Symbol	Typ	Unit
Maximum Junction-to-Ambient ^A	$t \leq 10\text{s}$	$R_{\theta JA}$	24	$^\circ\text{C/W}$
Maximum Junction-to-Ambient ^{A, D}	Steady-State		82	$^\circ\text{C/W}$
Maximum Junction-to-Case	Steady-State	$R_{\theta JC}$	2.4	$^\circ\text{C/W}$

Electrical characteristics (Ta=25°C ± 3°C)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
STATIC PARAMETERS						
BV _{DSS}	Drain-Source Breakdown Voltage	I _D =-250μA, V _{GS} =0V	-30			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =-30V, V _{GS} =0V T _J =55°C			-1 -5	μA
I _{GSS}	Gate-Body leakage current	V _{DS} =0V, V _{GS} = ±20			±100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} I _D =-250μA	-1.1	-1.5	-2.1	V
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =-10V, I _D =-20A V _{GS} =-4.5V, I _D =-16A		6.5 9.8	7.8 11.6	mΩ
g _{FS}	Forward Trans conductance	V _{DS} =-5V, I _D =-20A		70		S
V _{SD}	Diode Forward Voltage	I _S =-1A, V _{GS} =0V		-0.7	-1	V
I _S	Maximum Body-Diode Continuous Current				-55	A
DYNAMIC PARAMETERS						
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =-15V, f=1MHz		3406		pF
C _{oss}	Output Capacitance			369		pF
C _{rss}	Reverse Transfer Capacitance			306		pF
R _g	Gate resistance	f=1MHz		4.8		Ω
SWITCHING PARAMETERS						
Q _g	Total Gate Charge	V _{GS} =-10V, V _{DS} =-15V, I _D =-20A		69.8		nC
Q _{gs}	Gate Source Charge			13.6		nC
Q _{gd}	Gate Drain Charge			14		nC
t _{D(on)}	Turn-On Delay Time	V _{GS} =-10V, V _{DS} =-15V, R _L =0.75Ω, R _{GEN} =3Ω		11.3		ns
t _r	Turn-On Rise Time			71.3		ns
t _{D(off)}	Turn-Off Delay Time			95		ns
t _f	Turn-Off Fall Time			82		ns
t _{rr}	Body Diode Reverse Recovery Time	I _F =-20A, dI/dt=100A/μs		15.2		ns
Q _{rr}	Body Diode Reverse Recovery Charge	I _F =-20A, dI/dt=100A/μs		1.6		nC

A. The value of R_{θJA} is measured with the device mounted on 1in² FR-4 board with 1oz. Copper, in a still air environment with T_A=25°C. The value in any given application depends on the user's specific board design.

B. The power dissipation P_D is based on T_{J(MAX)}=150°C, using junction-to-case thermal resistance and is more useful in setting the upper dissipation limit for cases where additional heatsinking is used.

C. Repetitive rating, pulse width limited by junction temperature T_{J(MAX)}=150°C. Ratings are based on low frequency and duty cycles to keep initial T_J=25°C.

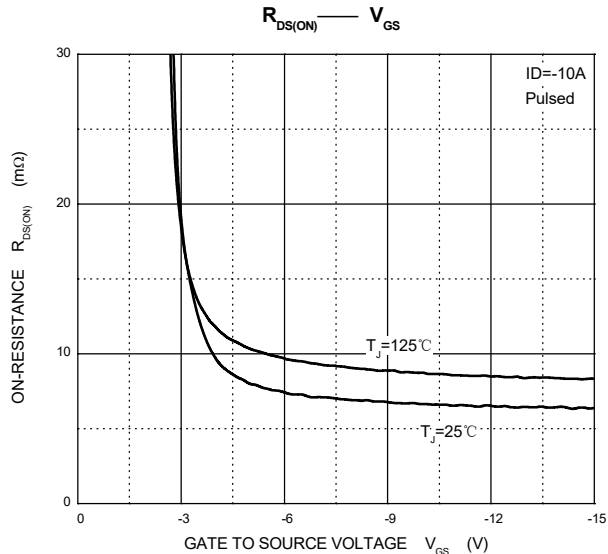
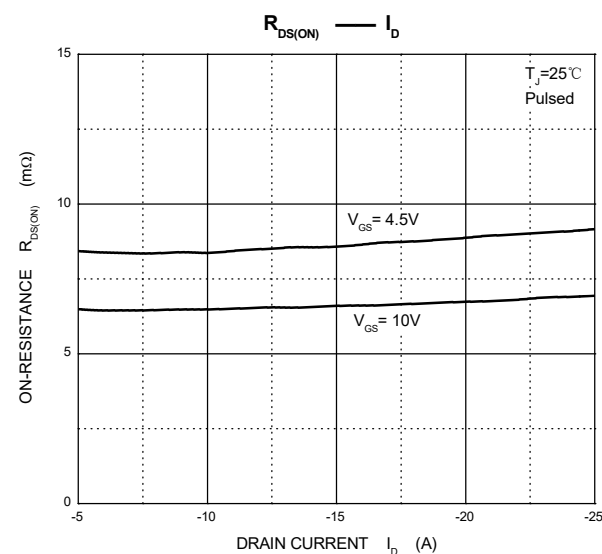
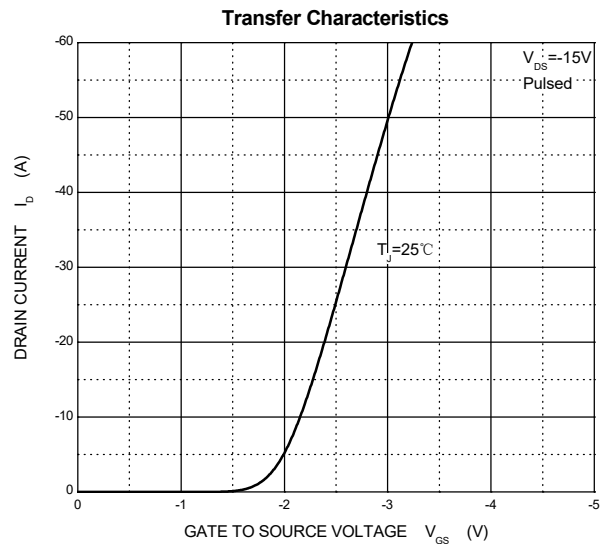
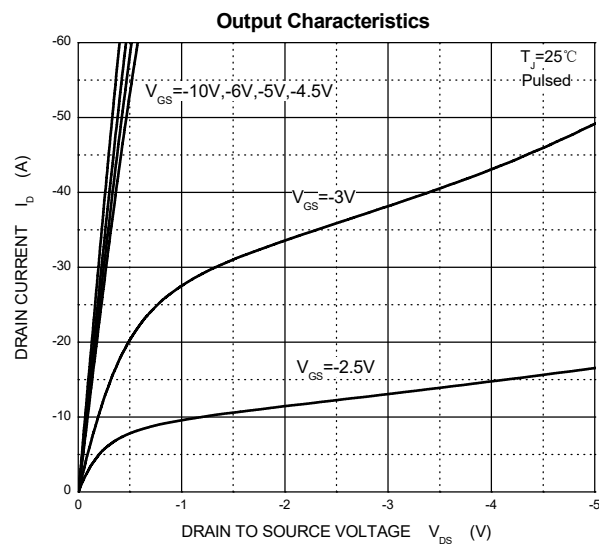
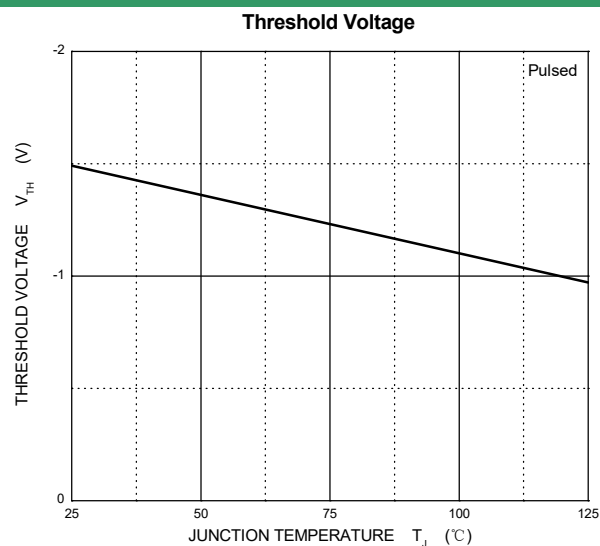
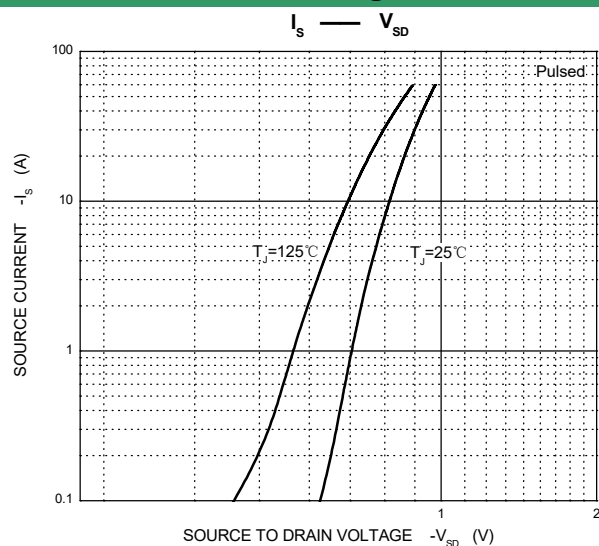
D. The R_{θJA} is the sum of the thermal impedance from junction to case R_{θJC} and case to ambient.

E. The static characteristics in Figures 1 to 6 are obtained using <300μs pulses, duty cycle 0.5% max.

F. These curves are based on the junction-to-case thermal impedance which is measured with the device mounted on 1in² FR-4 board with 1oz. Copper, in a still air environment with T_A=25°C

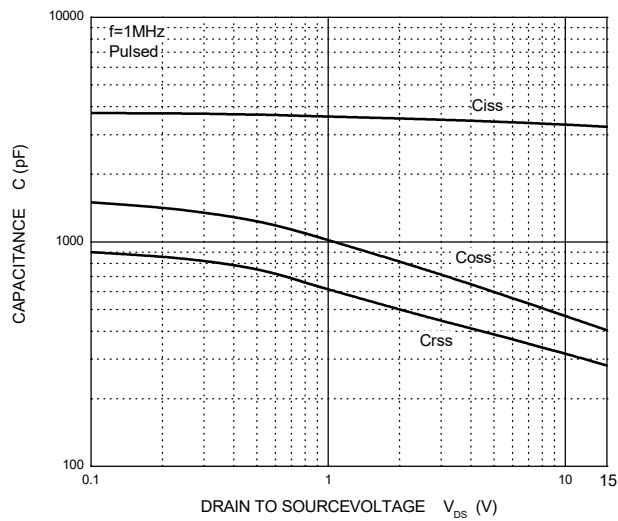
G. The maximum current rating is package limited

Electrical characteristics diagrams

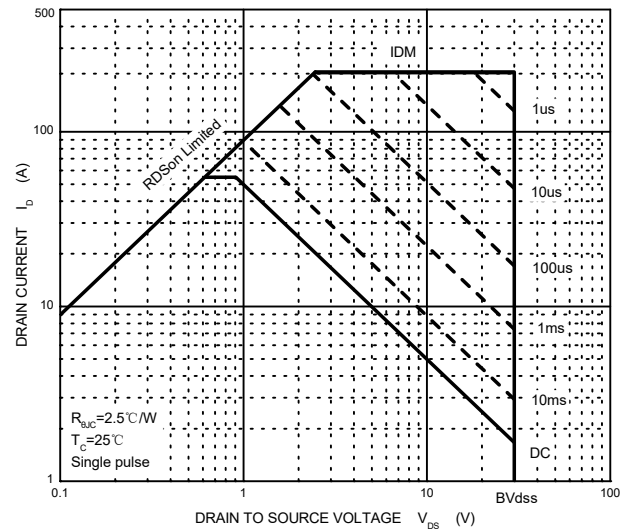


Electrical characteristics diagrams

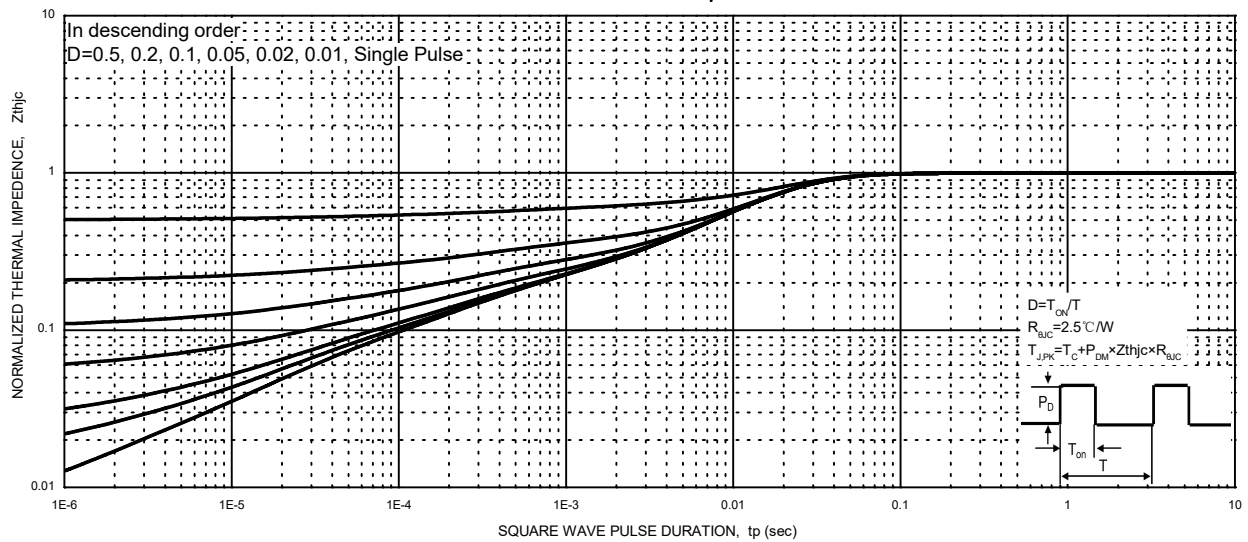
Capacitances



Maximum Forward Biased Safe Operating Area

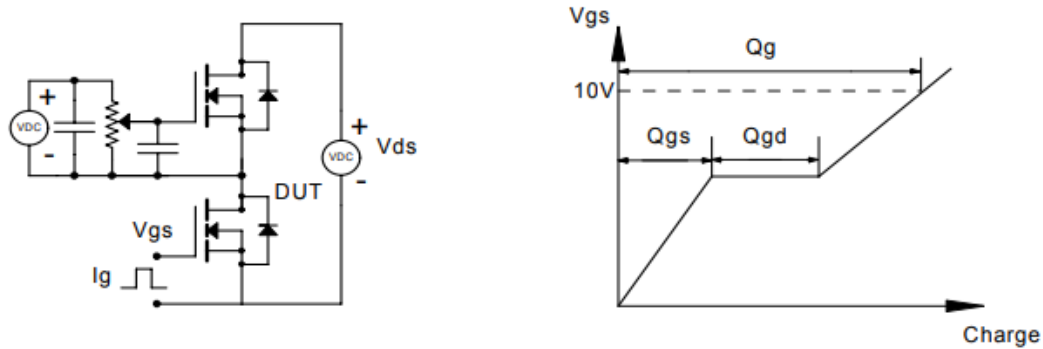


Normalized Transient Thermal Impedance

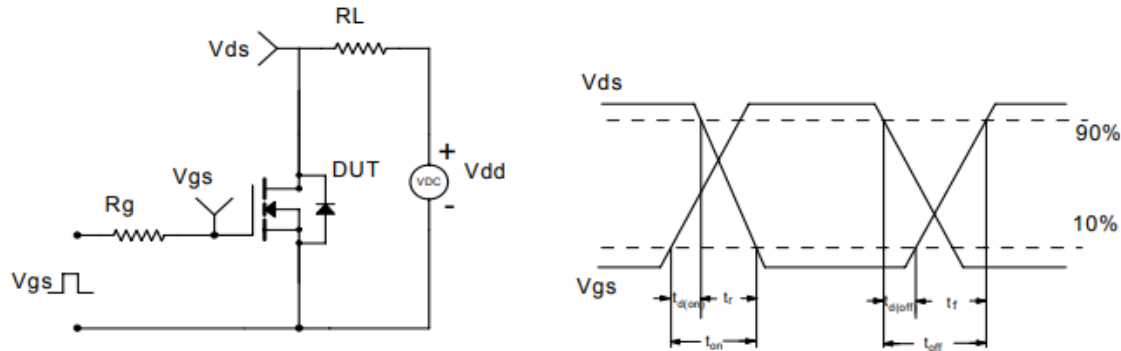


Test Circuit

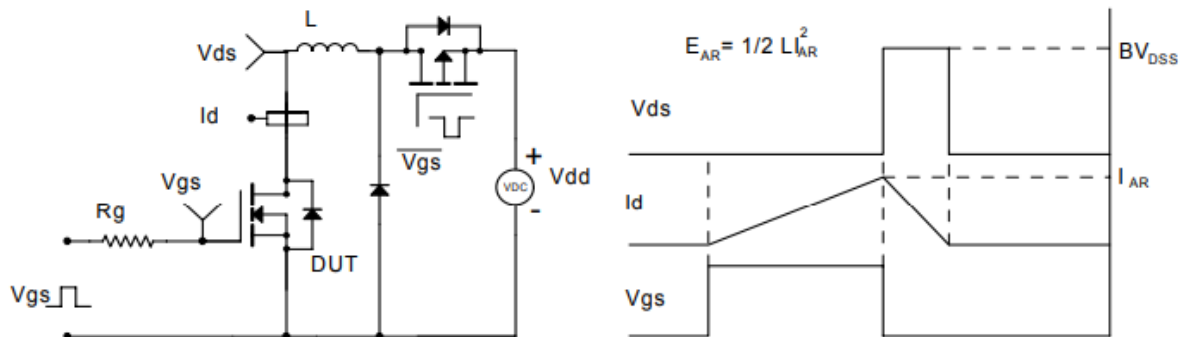
Gate Charge Test Circuit & Waveform



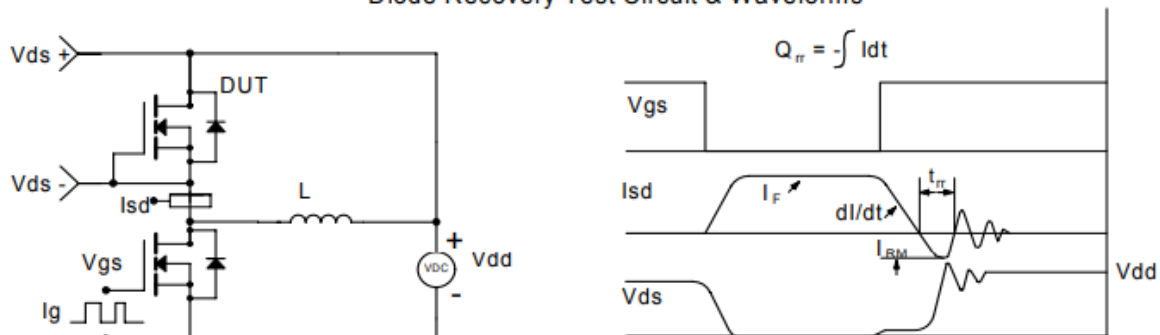
Resistive Switching Test Circuit & Waveforms

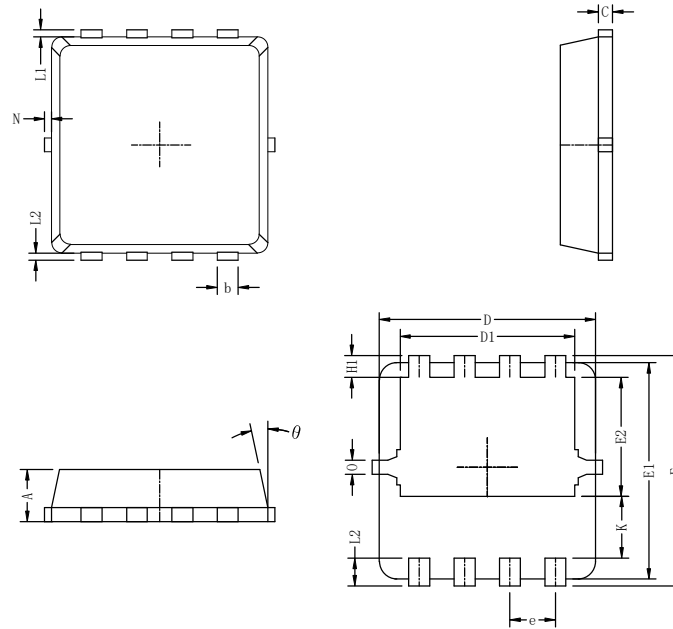


Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Package outline dimensions PDFN3030


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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