

Product Summary

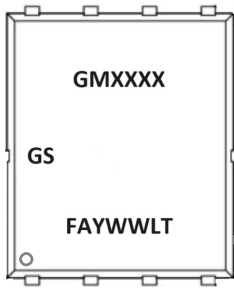
V_{DS} (V)	$R_{DS(on),max}$ (mΩ)	I_D (A)
-30	15@ $V_{GS} = -4.5V$	-35

Features

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

Application

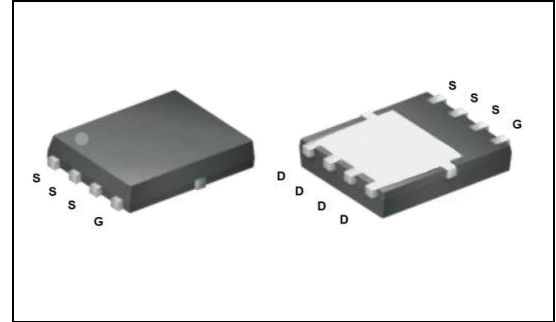
- ❖ Load Switch
- ❖ Battery protection
- ❖ Uninterruptible power supply



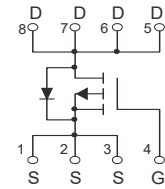
PDFN3333

NOTE:
 LOGO - GS
 GMXXXX- 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 ($T_a=25^\circ C$)

Parameter	Symbol	Limit	Unit
Drain-source voltage	V_{DS}	-30	V
Gate-source voltage	V_{GS}	± 20	
Continuous drain current ($V_{GS}=-4.5V$) ⁽¹⁾	$T_C=25^\circ C$	I_D	A
	$T_C=70^\circ C$	-35 -28	
Pulsed drain current ⁽²⁾	$I_{D,pulse}$	-140	
Power dissipation	$T_C=25^\circ C$	P_D	57 W
	$T_A=25^\circ C$		2.3 W
Operating junction and storage temperature range	T_J, T_{stg}	-55 to 150	$^\circ C$

Thermal Characteristic

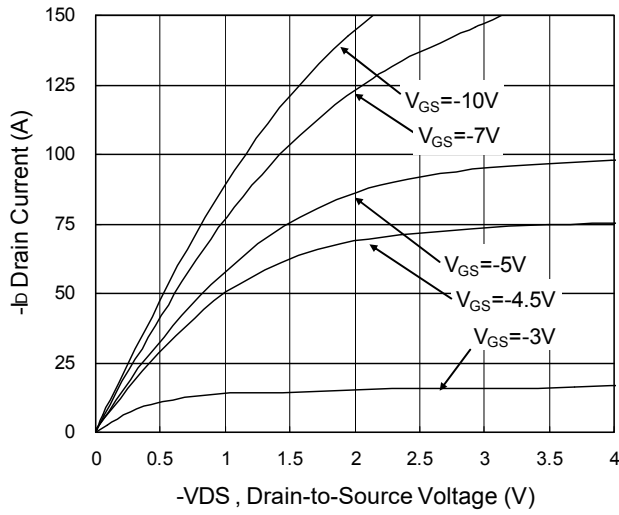
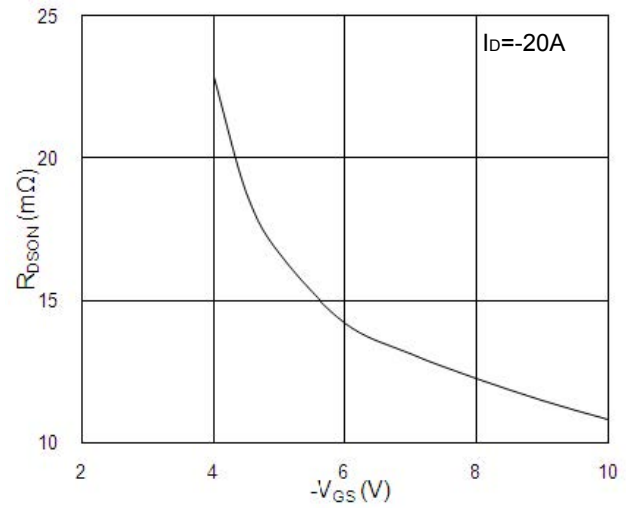
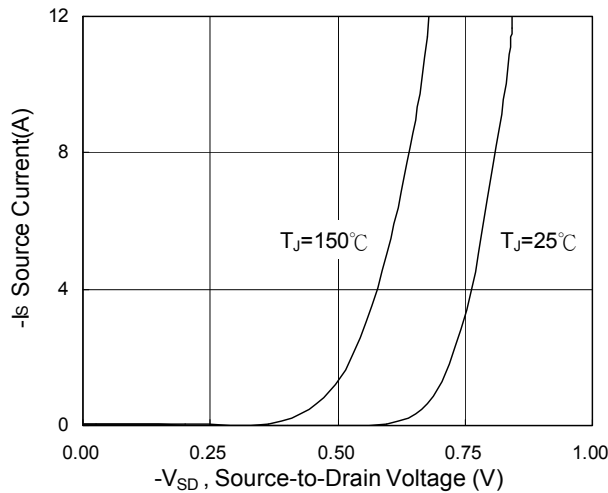
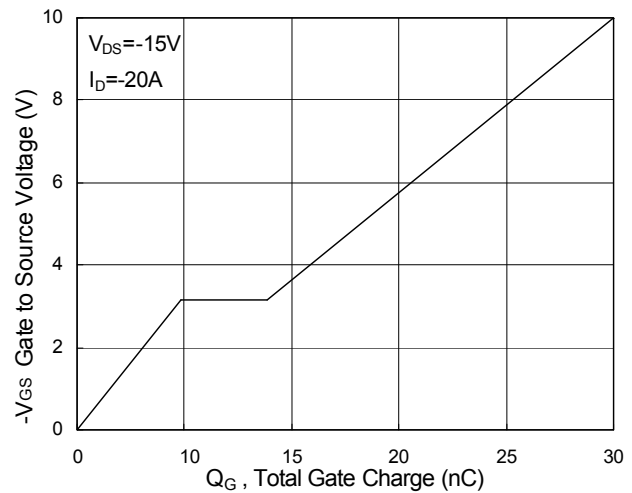
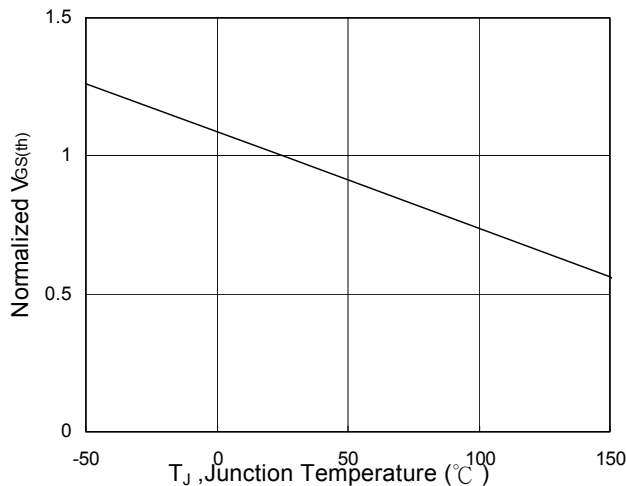
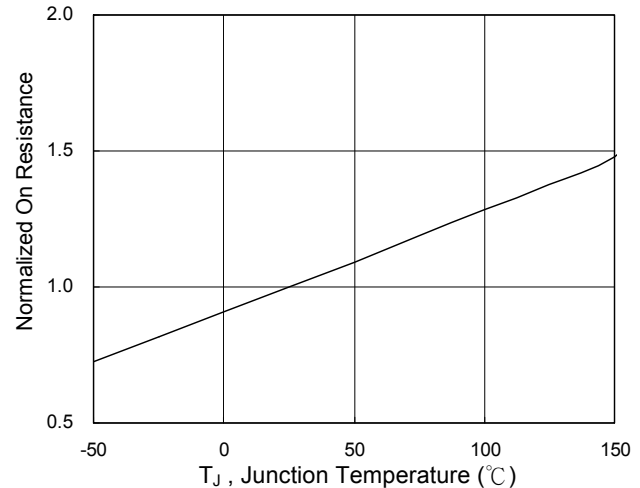
Parameter	Symbol	Max.	Unit
Thermal resistance, junction-to-case	$R_{\theta JC}$	2.2	$^\circ C/W$
Thermal resistance, junction-to-ambient ⁽⁴⁾	$R_{\theta JA}$	60	

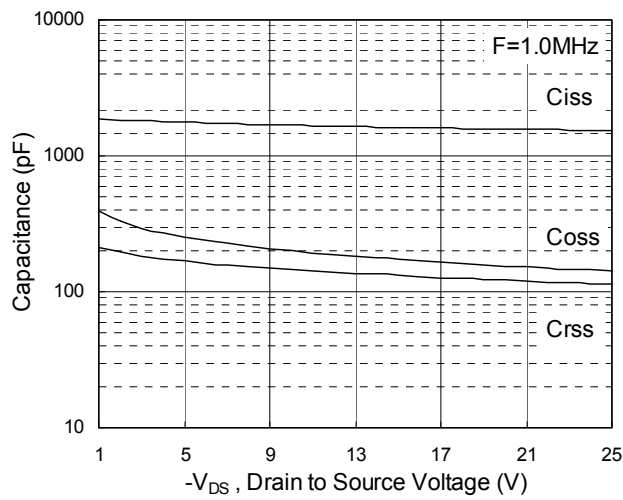
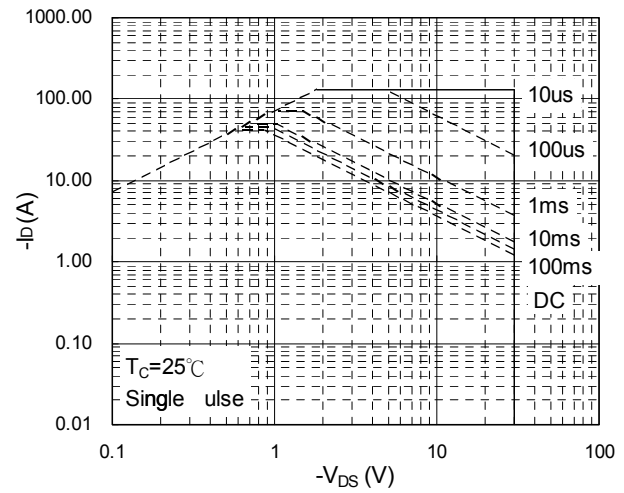
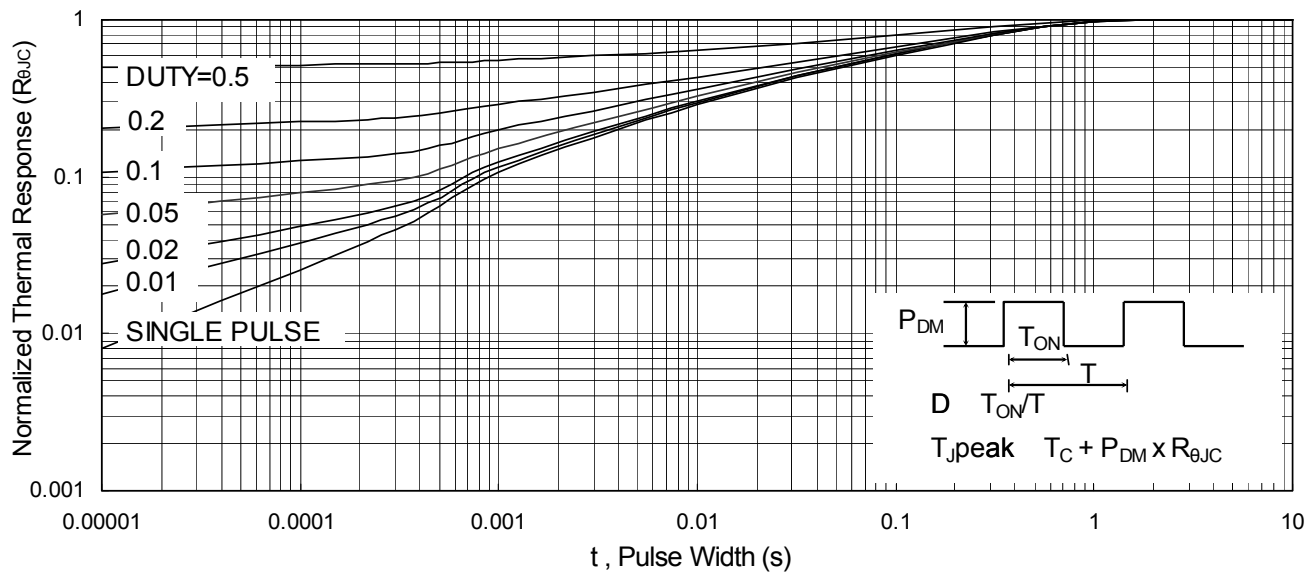
**Electrical characteristics (Ta=25°C ± 3°C)**

Parameter	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Static parameter ⁽⁴⁾						
Drain to source breakdown voltage	V _{(BR)DSS}	V _{GS} = 0 V, I _D = -250 μA	-30			V
Gate-source threshold voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = -250 μA	-1.2	-1.6	-2.0	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} = -24 V, V _{GS} = 0 V			-1	μA
Drain-source on-resistance	R _{DS(on)}	V _{GS} = -10V, I _D = -20 A		12.5	15	mΩ
		V _{GS} = -4.5V, I _D = -20 A		19	23	mΩ
Forward transconductance	g _{fs}	V _{DS} = -5.0V, I _D = -30 A		15		S
Gate resistance	R _g	V _{GS} = 0V, V _{DS} = 0V, f = 1MHz		9		Ω
Dynamic ⁽⁵⁾						
Total gate charge	Q _g	V _{DS} = -15V, I _D = -20A V _{GS} = -10V		30		nC
Gate-source charge	Q _{gs}			3.2		
Gate-drain charge	Q _{gd}			5.1		
Turn-on delay time	t _{d(on)}	V _{GS} = -10V, V _{DS} = -15V I _D = -15 A, R _G = 2.7 Ω		6		ns
Rise time	t _r			41		
Turn-off delay time	t _{d(off)}			51		
Fall time	t _f			30		
Input capacitance	C _{iss}	V _{DS} = -15 V, V _{GS} = 0 V, f = 1 MHz		1380		pF
Output capacitance	C _{oss}			180		
Reverse transfer capacitance	C _{rss}			150		
Reverse Diode Characteristics ⁽⁵⁾						
Diode forward voltage	V _{SD}	V _{GS} = 0 V, I _F = -1 A		0.8	1.1	V
Reverse recovery time	t _{rr}	I _F = -20 A, di/dt = 100 A/μs		14		ns
Reverse recovery charge	Q _{rr}			6.2		nC

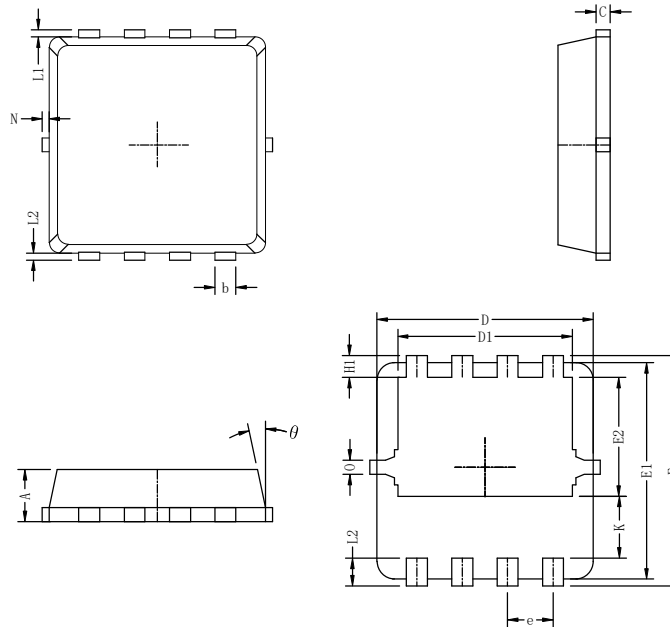
Notes

1. This current is chip limited, which is calculated based on R_{thjc} .
2. This current is calculated on single pulse with 10μs Pulse & Duty Cycle = 1%.
3. Device mounted on FR-4 substrate PC board with 2oz copper in 1inch square cooling area.
4. Short duration pulse test used to minimize self-heating effect.
5. Defined by design, not subject to production.

Electrical characteristics diagrams

Fig.1 Typical Output Characteristics

Fig.2 On-Resistance vs. G-S Voltage

Fig.3 Forward Characteristics of Reverse

Fig.4 Gate-Charge Characteristics

Fig.5 Normalized VGS(th) vs. TJ

Fig.6 Normalized RDS(on) vs. TJ

Electrical characteristics diagrams

Fig.7 Capacitance

Fig.8 Safe Operating Area

Fig.9 Normalized Maximum Transient Thermal Impedance

Package outline dimensions 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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