

Product Summary

V_{DS} (V)	$R_{DS(on),max}$ (mΩ)	I_D (A)
-20	5.5@ $V_{GS} = -4.5V$	-50

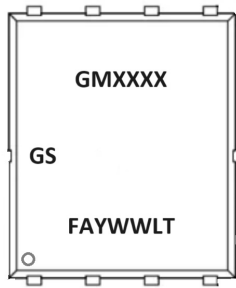
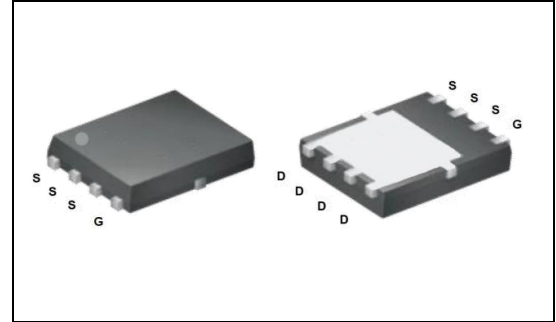
Features

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

Application

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

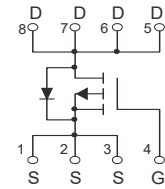
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NOTE:
 LOGO - GS
 GMXXXX- Part number code
 F - Fab location code
 A - Assembly location code
 Y - Year code
 WW - Week code
 L&T - Assembly lot code

Equivalent circuit



Absolute Maximum Rating ($T_A=25^\circ\text{C}$)

Parameter	Symbol	Limit	Unit
Drain-source voltage	V_{DS}	-20	V
Gate-source voltage	V_{GS}	± 12	
Continuous drain current ($V_{GS}=-4.5V$) ⁽¹⁾	I_D	-50	A
	I_D	-18	
Pulsed drain current ⁽²⁾	$I_{D,pulse}$	-100	
Power dissipation	P_D	30	W
	P_D	19	W
Operating junction and storage temperature range	T_J, T_{stg}	-55 to 150	$^\circ\text{C}$

Thermal Characteristic

Parameter	Symbol	Max.	Unit
Thermal resistance, junction-to-case	$R_{\theta JC}$	4.2	$^\circ\text{C/W}$
Thermal resistance, junction-to-ambient ⁽⁴⁾	$R_{\theta JA}$	75	

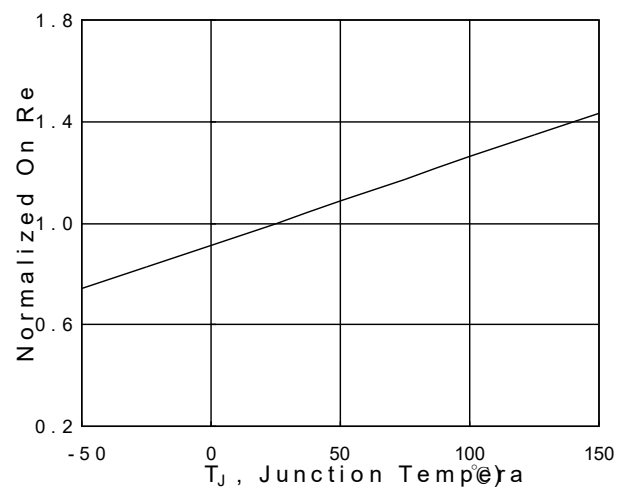
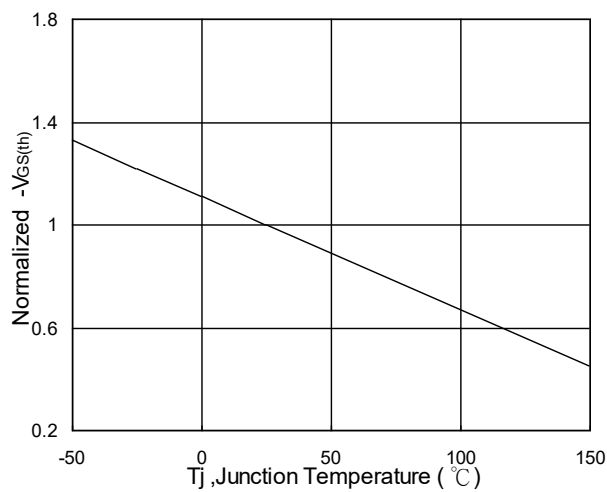
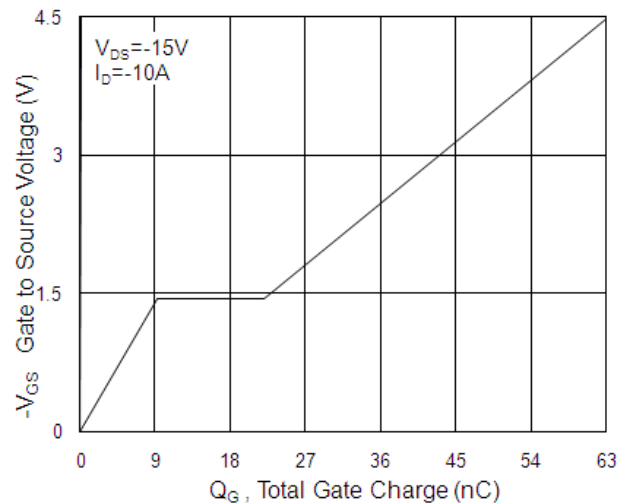
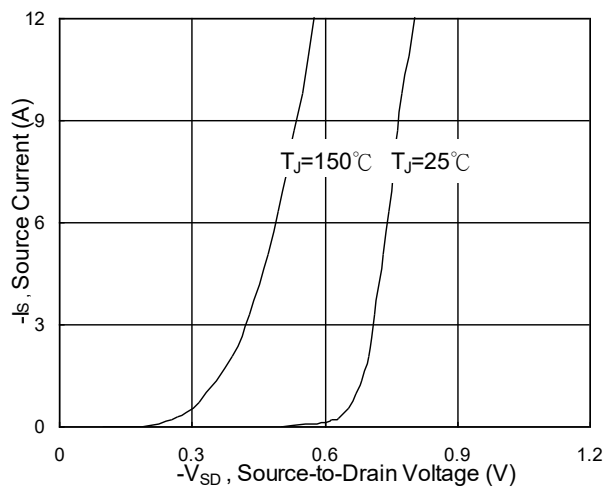
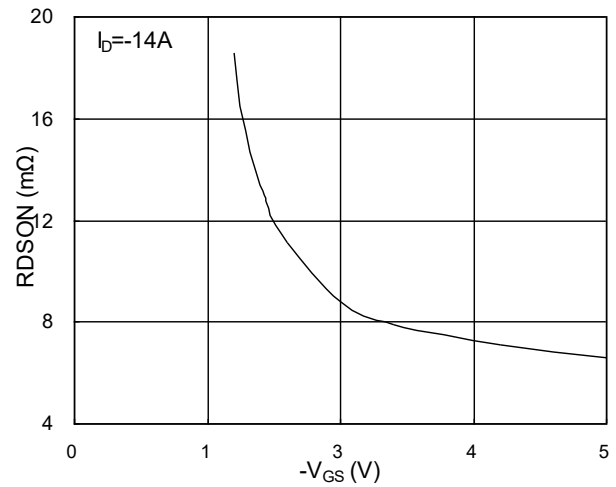
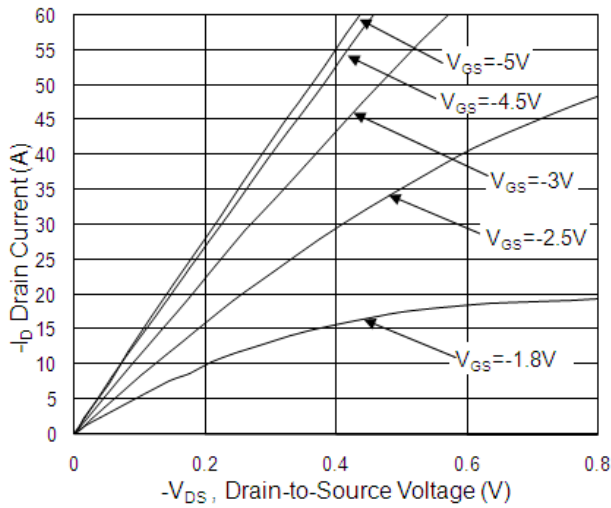
**Electrical characteristics (Ta=25°C ± 3°C)**

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	-20			V
Gate-source threshold voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = -250 μA	-0.45	-0.65	-0.9	V
Gate-body leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ±12 V			±100	nA
Zero gate voltage drain current	I _{DSS}	V _{DS} = -20 V, V _{GS} = 0 V			-1	μA
Drain-source on-resistance	R _{DS(on)}	V _{GS} = -4.5V, I _D = -15 A		4.8	5.5	mΩ
	R _{DS(on)}	V _{GS} = -2.5V, I _D = -15 A		6.1	6.5	mΩ
Forward transconductance	g _{fs}	V _{DS} = -5.0V, I _D = -8A		15		S
Gate resistance	R _g	V _{GS} = 0V, V _{DS} = 0V, f = 1MHz		5.9		Ω
Dynamic ⁽⁵⁾						
Total gate charge	Q _g	V _{DS} = -15V, I _D = -10A V _{GS} = -4.5V		59		nC
Gate-source charge	Q _{gs}			9		
Gate-drain charge	Q _{gd}			11.5		
Turn-on delay time	t _{d(on)}	V _{GS} = -4.5V, V _{DS} = -10V I _D = -10 A, R _{GEN} = 3.3Ω		16.4		ns
Rise time	t _r			73.7		
Turn-off delay time	t _{d(off)}			186		
Fall time	t _f			179		
Input capacitance	C _{iss}	V _{DS} = -15 V, V _{GS} = 0 V, f = 1 MHz		5576		pF
Output capacitance	C _{oss}			518		
Reverse transfer capacitance	C _{rss}			428		
Reverse Diode Characteristics ⁽⁵⁾						
Diode forward voltage	V _{SD}	I _S = -2.0A, V _{GS} = 0V		-0.6	-1.0	V
Diode Forward Current	I _s	T _A = 25°C			-10.7	A
Reverse Recovery Time	t _{rr}	I _F =-10A , dI/dt=100A/μs , T _J =25°C		29		ns
Reverse Recovery Charge	Q _{rr}			18.6		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



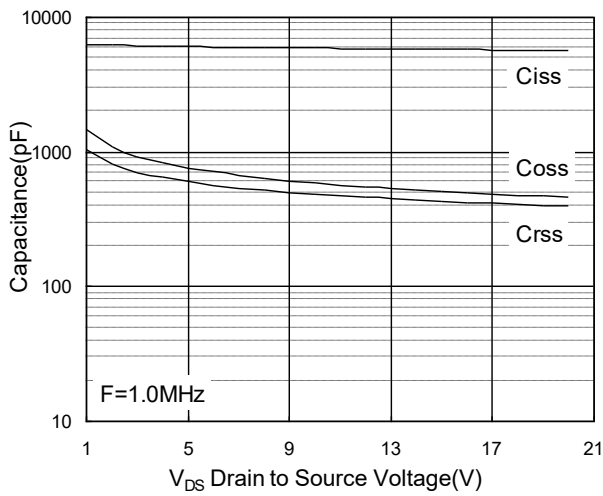


Fig.7 Capacitance

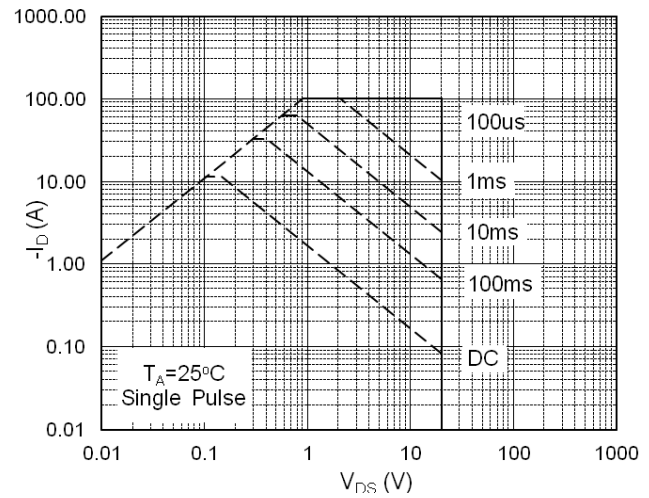


Fig.8 Safe Operating Area

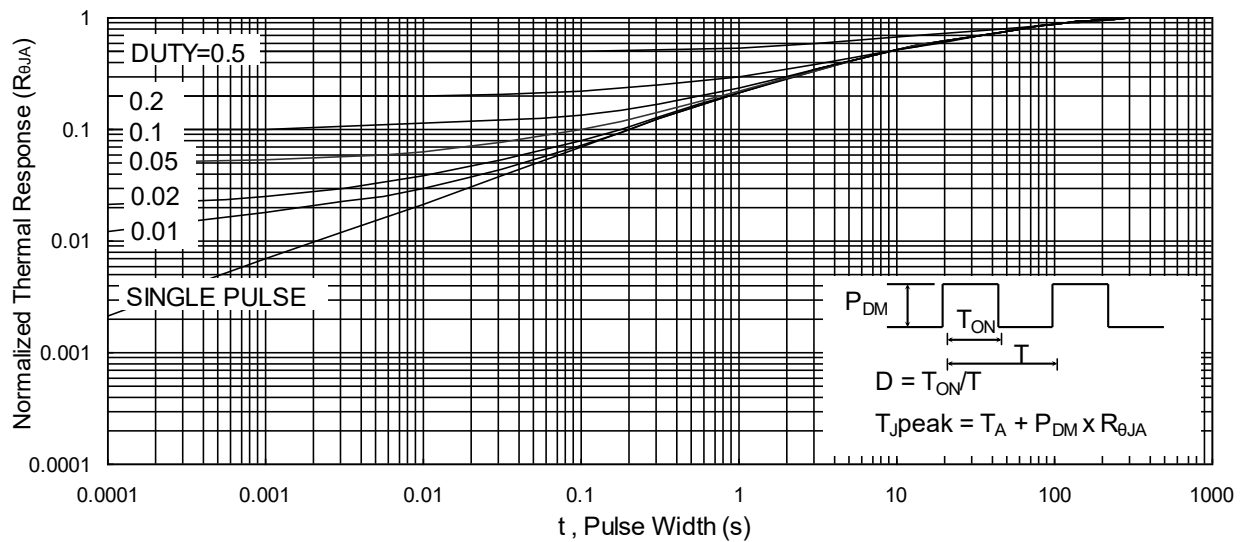
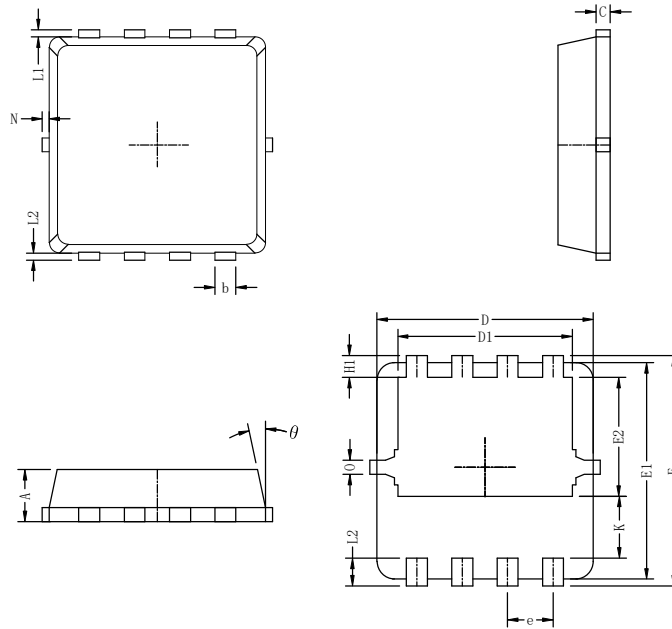


Fig.9 Normalized Maximum Transient Thermal Impedance

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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