

Features

- Advanced Shielded-Gate Trench technology
- Ultra-low on-resistance and gate-charge
- HBM: JESD22-A114-B: 1B
- RoHS compliant with Halogen-free

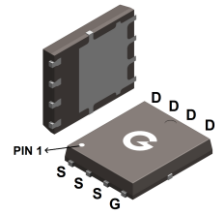
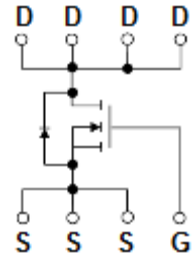
HF

Applications

- High-frequency DC-to-DC convertors
- Motor controllers
- Battery management and protection
- Server power

Mechanical Data

- Case: PDFN5×6-8L
- Molding Compound: UL Flammability Classification Rating 94V-0
- Terminals: Matte tin-plated leads; solderability-per MIL-STD-202, Method 208



PDFN5×6-8L

Ordering Information

Part Number	Package	Shipping Quantity	Marking Code
BL030N03T-5DL8	PDFN5×6-8L	5000 pcs / Tape & Reel	030N03T

Maximum Ratings (@ T_C = 25°C unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-to-Source Voltage	V _{DSS}	30	V
Gate-to-Source Voltage	V _{GSS}	±20	V
Continuous Drain Current (T _C = 25°C)	I _D	135	A
Continuous Drain Current (T _C = 100°C)		85	
Continuous Drain Current (T _A = 25°C) *1		30	
Continuous Drain Current (T _A = 100°C) *1		19	
Pulsed Drain Current (t _p = 10μs, T _C = 25°C)	I _{DM}	600	A
Single Pulse Avalanche Energy (L = 0.1mH) *2	E _{AS}	28	mJ

Thermal Characteristics

Parameter	Symbol	Value	Unit
Power Dissipation (T _C = 25°C)	P _D	83	W
Thermal Resistance Junction-to-Air *1	R _{θJA}	30	°C/W
Thermal Resistance Junction-to-Case	R _{θJC}	1.5	°C/W
Operating Junction Temperature Range	T _J	-55 ~ +150	°C
Storage Temperature Range	T _{STG}	-55 ~ +150	°C

Electrical Characteristics (@ $T_J = 25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
V _{DSS}	Drain-Source Breakdown Voltage	V _{GS} = 0V, I _D = 250μA	30	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 30V, V _{GS} = 0V	-	-	1	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} = ±20V, V _{DS} = 0V	-	-	±100	nA
On Characteristics *3						
R _{DS(ON)}	Static Drain-Source On-resistance	V _{GS} = 10V, I _D = 20A	-	2.5	3.1	mΩ
		V _{GS} = 5V, I _D = 20A	-	3.4	4.6	
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = 250μA	1	1.6	2.5	V
R _G	Gate Resistance	V _{GS} = 0V, f = 1MHz	-	3.5	-	Ω
Dynamic Characteristics						
C _{ISS}	Input Capacitance	V _{GS} = 0V V _{DS} = 15V f = 1.0MHz	-	2472	-	pF
C _{OSS}	Output Capacitance		-	1186	-	
C _{RSS}	Reverse Transfer Capacitance		-	64	-	
Switching Characteristics						
t _{d(ON)}	Turn-on Delay Time	V _{DD} = 15V, V _{GS} = 10V R _G = 3.0Ω, I _D = 20A	-	14	-	ns
t _r	Turn-on Rise Time		-	6	-	
t _{d(OFF)}	Turn-Off Delay Time		-	28	-	
t _f	Turn-Off Fall Time		-	14	-	
Q _G	Total Gate-Charge	V _{DD} = 15V	-	36.5	-	nC
Q _{GS}	Gate to Source Charge	V _{GS} = 10V	-	8	-	
Q _{GD}	Gate to Drain (Miller) Charge	I _D = 20A	-	5.5	-	
Source-Drain Diode Characteristics						
V _{SD}	Diode Forward Voltage	I _{SD} = 20A, V _{GS} = 0V	-	0.8	1.2	V
t _{rr}	Body Diode Reverse Recovery Time	I _F = 20A, V _{GS} = 0V di/dt = 100A/us	-	95	-	ns
Q _{rr}	Body Diode Reverse Recovery charge		-	105	-	nC

Notes:

1. Surface mounted on 1 inch² FR-4 board with 20Z copper
2. The E_{AS} test condition is $V_{DD} = 20V, L = 0.1mH, V_{GS} = 10V$, Starting $T_J = 25^\circ\text{C}$
3. Pulse width $\leq 300\mu s$; duty cycle $\leq 2\%$

Ratings and Characteristics Curves (@ $T_A = 25^\circ\text{C}$ unless otherwise specified)

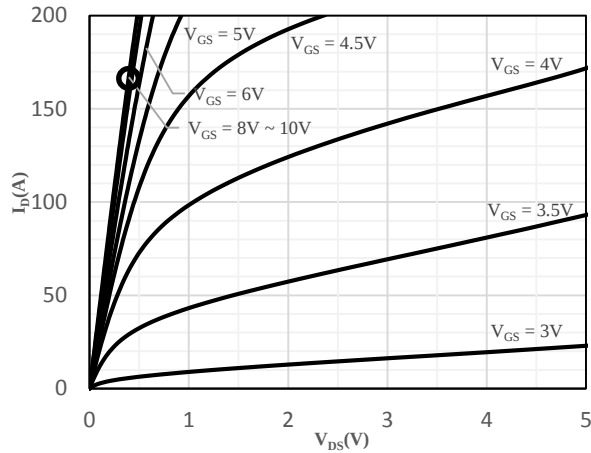


Fig 1 Typical Output Characteristics

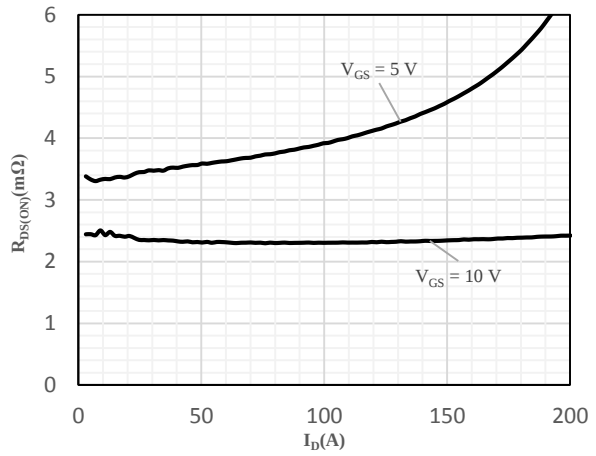


Fig 2 On-Resistance vs. Drain Current
and Gate Voltage

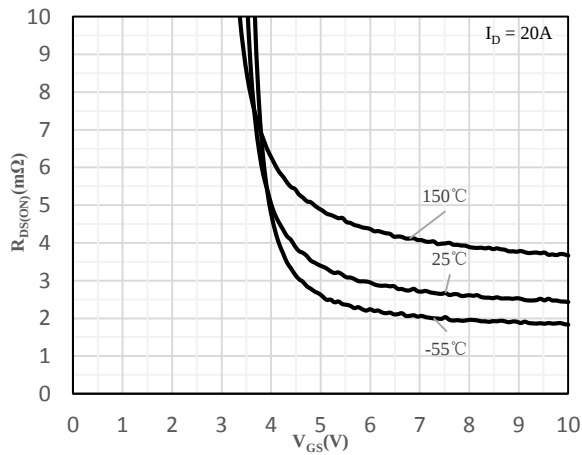


Fig 3 On-Resistance vs. Gate-Source Voltage

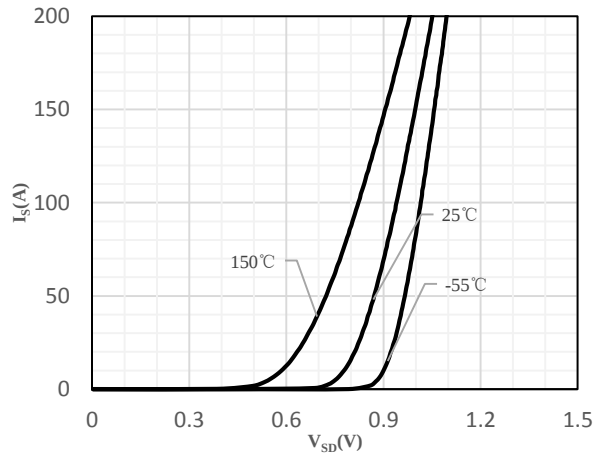


Fig 4 Body-Diode Characteristics

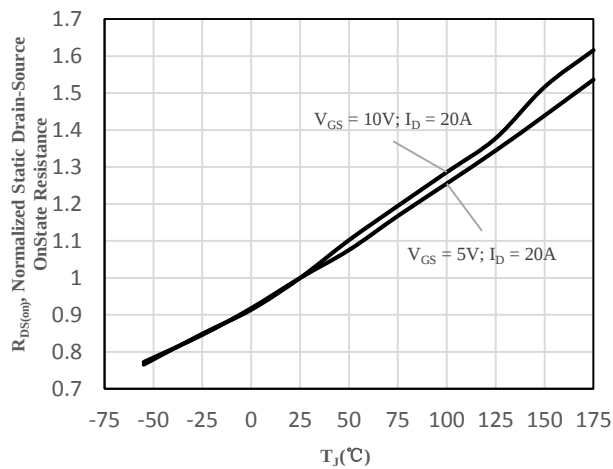


Fig 5 Normalized On-Resistance vs. Junction
Temperature

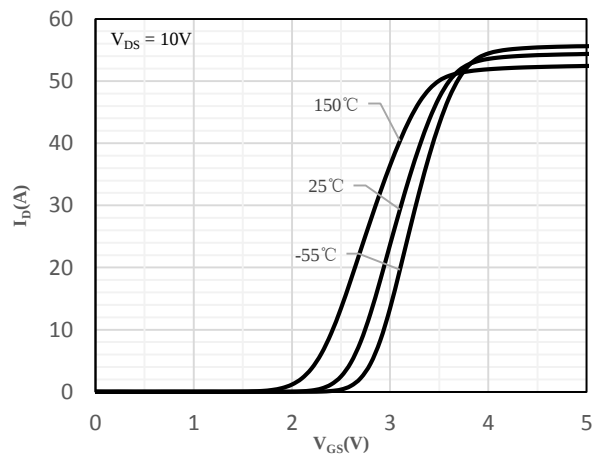


Fig 6 Transfer Characteristics

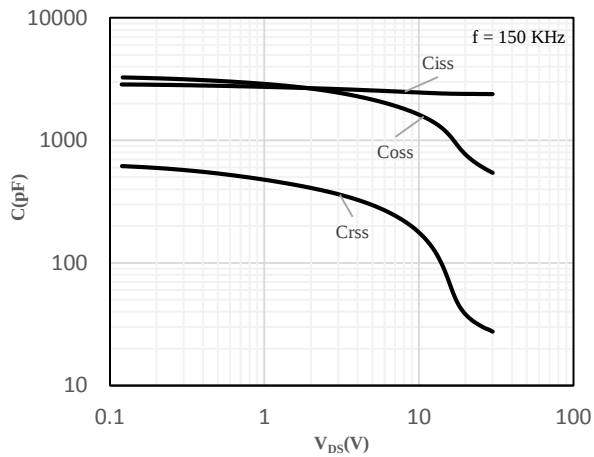


Fig 7 Capacitance Characteristics

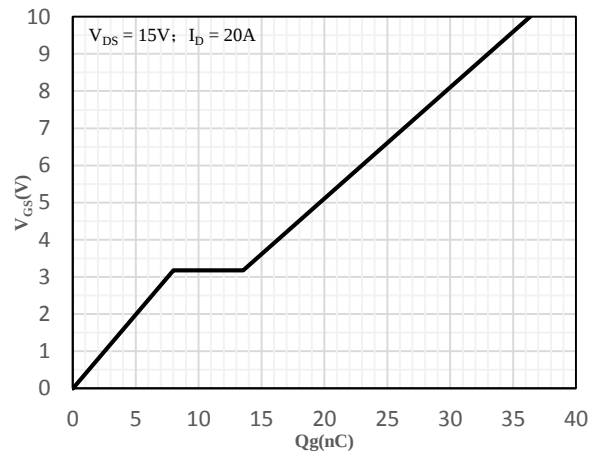
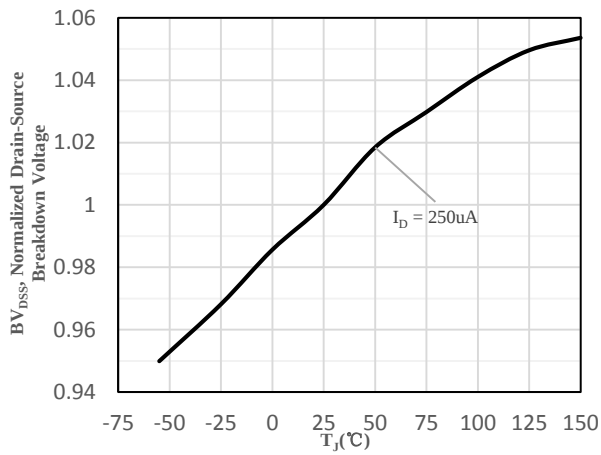


Fig 8 Gate-Charge Characteristics



**Fig 9 Normalized Breakdown Voltage
vs. Junction Temperature**

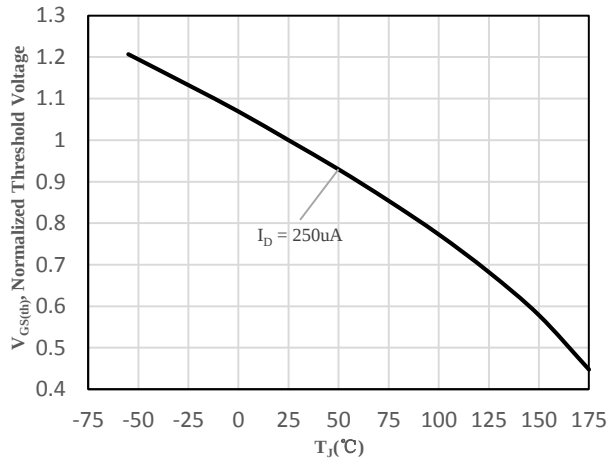


Fig 10 Normalized $V_{GS(th)}$ vs. Junction Temperature

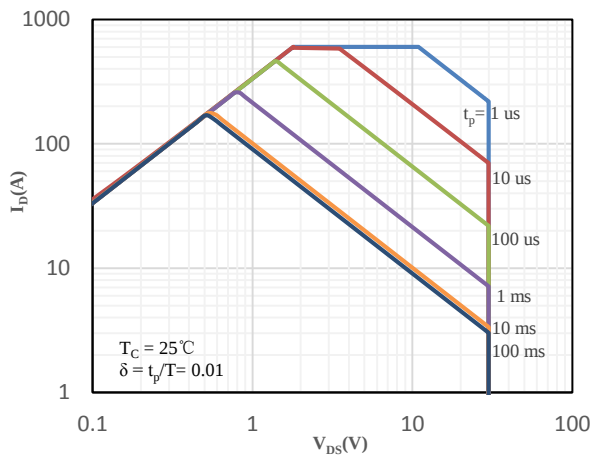


Fig 11 Safe Operation Area

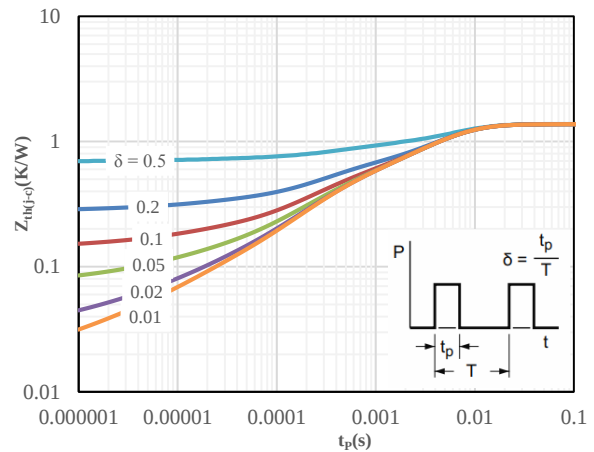
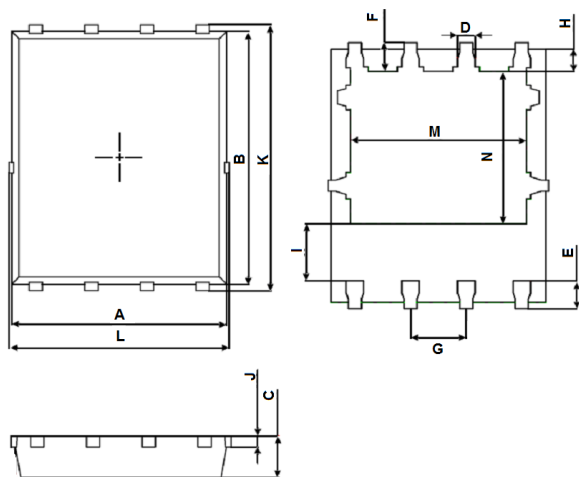


Fig 12 Maximum transient thermal impedance

Package Outline Dimensions (Unit: mm)



PDFN5x6-8L		
Dimension	Min.	Max.
A	4.824	4.976
B	5.674	5.826
C	0.900	1.000
D	0.350	0.450
E	0.559	0.711
F	0.574	0.726
G	1.250	1.290
H	0.424	0.576
I	1.190	1.390
J	0.154	0.354
K	5.974	6.126
L	4.944	5.096
M	3.910	4.110
N	3.375	3.575

Mounting Pad Layout (Unit: mm)

PDFN5x6-8L

