

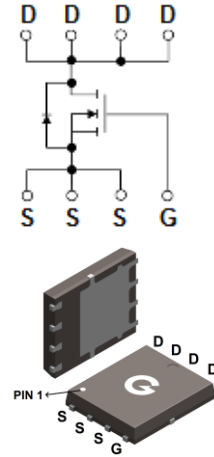
Features

- Ultra-low on-resistance and gate-charge
- Advanced shielded-gate technology
- HBM: AEC-Q101-001: H1B (JESD22-A114-B: 1B)
- Halogen free
- Qualified to AEC-Q101 standards for high reliability

HF

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
TQBL031N06T-5DL8	PDFN5×6-8L	5000 pcs / Tape & Reel	031N06T

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

Parameter	Symbol	Value	Unit
Drain-to-Source Voltage	V _{DSS}	60	V
Gate-to-Source Voltage	V _{GSS}	±20	V
Continuous Drain Current (T _C = 25°C)	I _D	130	A
Continuous Drain Current (T _C = 100°C)		92	A
Continuous Drain Current (T _A = 25°C) *1		28	A
Continuous Drain Current (T _A = 100°C) *1		20	A
Pulsed Drain Current (t _p = 10μs, T _C = 25°C)	I _{DM}	670	A
Single Pulse Avalanche Energy *3	E _{AS}	218	mJ
Power Dissipation (T _C = 25°C, R _{θJC} = 0.9°C/W)	P _D	167	W
Operating Junction Temperature Range	T _J	-55 ~ +175	°C
Storage Temperature Range	T _{STG}	-55 ~ +175	°C

Thermal Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal Resistance Junction-to-Case	R _{θJC}	-	0.9	1.4	°C/W
Thermal Resistance Junction-to-Air *1	R _{θJA}	-	23	30	°C/W

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	60	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 60V, V _{GS} = 0V	-	-	1	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} = ±20V, V _{DS} = 0V	-	-	±100	nA
On Characteristics						
R _{DS(ON)}	Drain-Source On-resistance *2	V _{GS} = 10V, I _D = 20A	-	2.7	3.1	mΩ
		V _{GS} = 4.5V, I _D = 20A	-	3.5	4.4	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = 250μA	1	1.7	2.5	V
R _g	Gate Resistance	V _{GS} = 0V, f = 1MHz	-	1	-	Ω
Dynamic Characteristics						
C _{ISS}	Input Capacitance	V _{GS} = 0V V _{DS} = 25V f = 1.0MHz	-	3146	-	pF
C _{OSS}	Output Capacitance		-	1400	-	
C _{RSS}	Reverse Transfer Capacitance		-	50	-	
Switching Characteristics						
t _{d(ON)}	Turn-on Delay Time	V _{DD} = 30V V _{GS} = 15V I _D = 15A R _G = 3.3Ω	-	11	-	ns
t _r	Turn-on Rise Time		-	38	-	
t _{d(OFF)}	Turn-Off Delay Time		-	50	-	
t _f	Turn-Off Fall Time		-	25	-	
Q _G	Total Gate-Charge	V _{DD} = 30V V _{GS} = 10V I _D = 30A	-	53	-	nC
Q _{GS}	Gate to Source Charge		-	8	-	
Q _{GD}	Gate to Drain (Miller) Charge		-	9	-	
Source-Drain Diode Characteristics						
V _{SD}	Diode Forward Voltage *2	I _S = 30A, V _{GS} = 0V	-	0.8	1.2	V
t _{rr}	Reverse Recovery Time	I _S = 30A, V _{GS} = 0V di/dt = 100A/μs	-	60	-	ns
Q _{rr}	Reverse Recovery Charge		-	86	-	nC

Notes:

1. The data tested by surface mounted on a 1 inch² FR-4 board with 20Z copper
2. The data tested by pulsed, pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
3. The E_{AS} data shows Max. rating. The test condition is $V_{DD} = 30V, V_{GS} = 10V, L = 0.5mH$

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

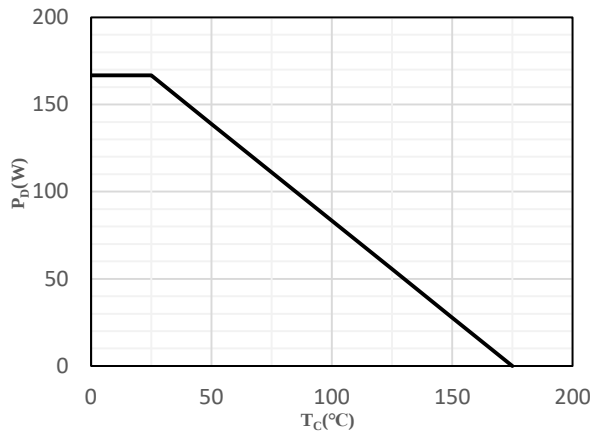


Fig 1 Power Dissipation

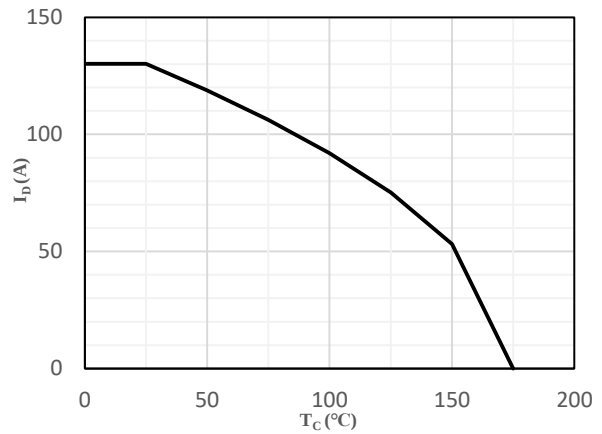


Fig 2 Drain Current

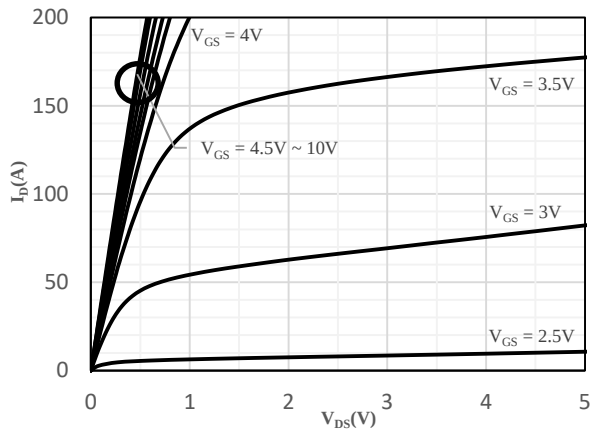


Fig 3 Typical Output Characteristics

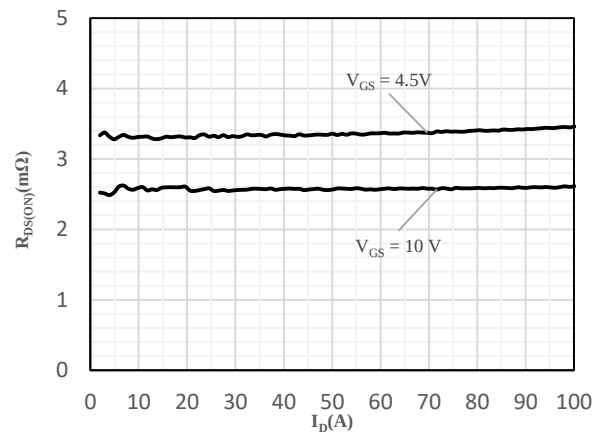


Fig 4 On-Resistance vs. Drain Current
and Gate Voltage

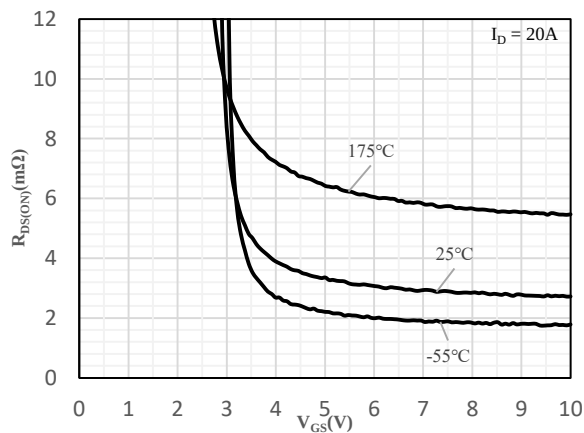


Fig 5 On-Resistance vs. Gate-Source Voltage

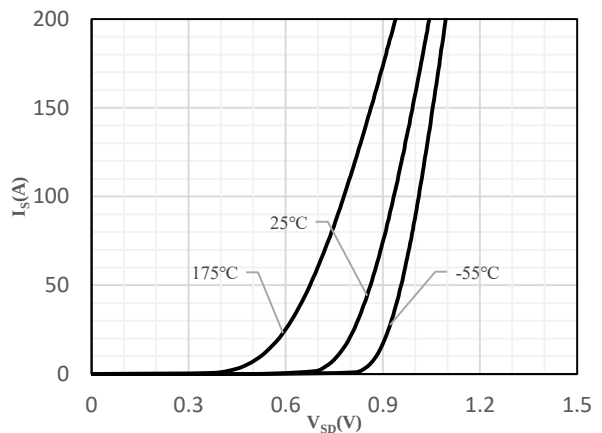


Fig 6 Body-Diode Characteristics

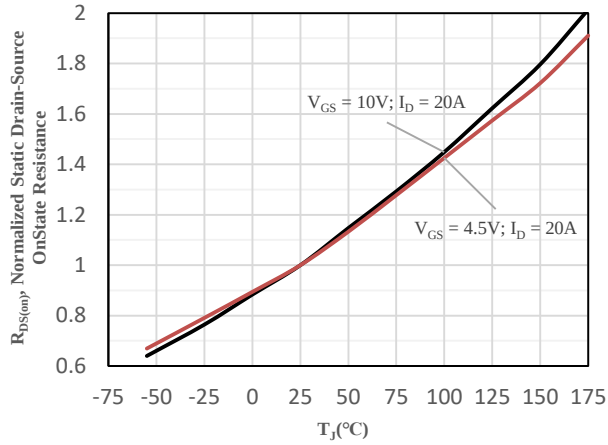


Fig 7 Normalized On-Resistance vs. Junction Temperature

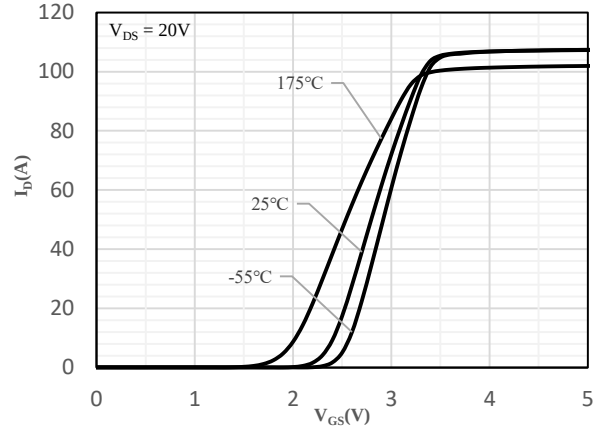


Fig 8 Transfer Characteristics

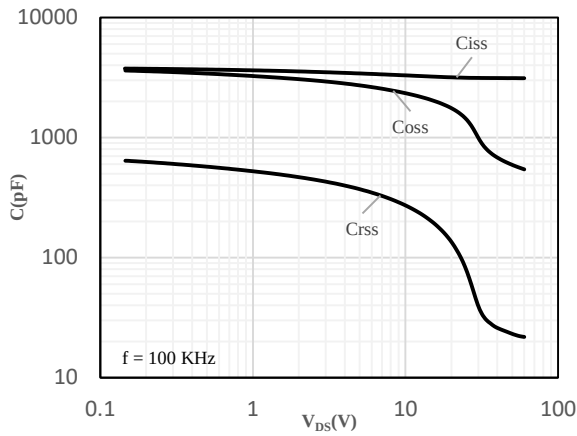


Fig 9 Capacitance Characteristics

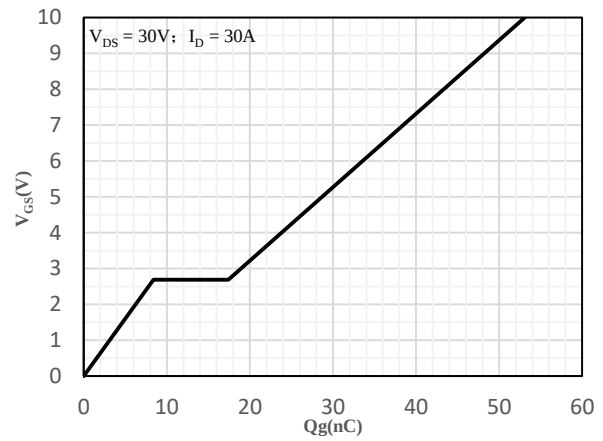


Fig 10 Gate-Charge Characteristics

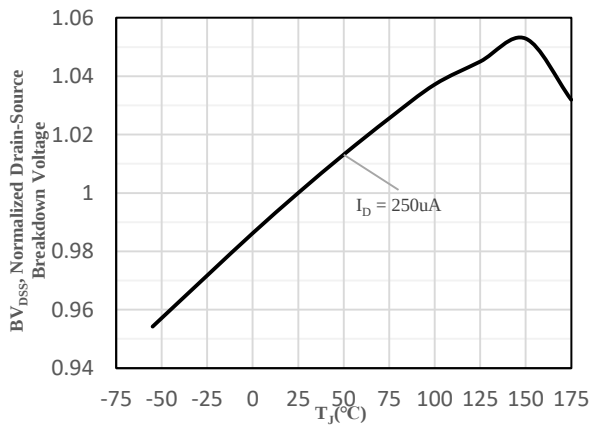


Fig 11 Normalized Breakdown Voltage vs. Junction Temperature

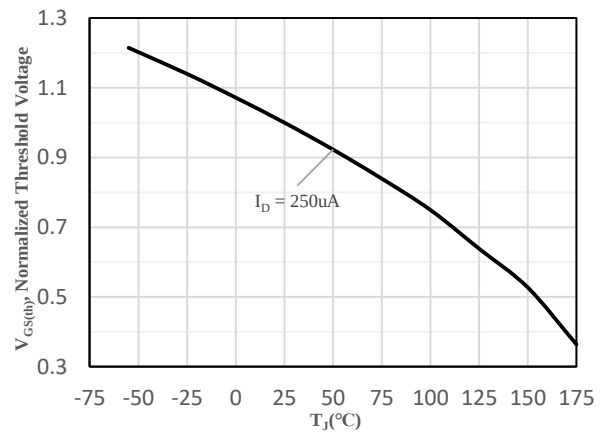
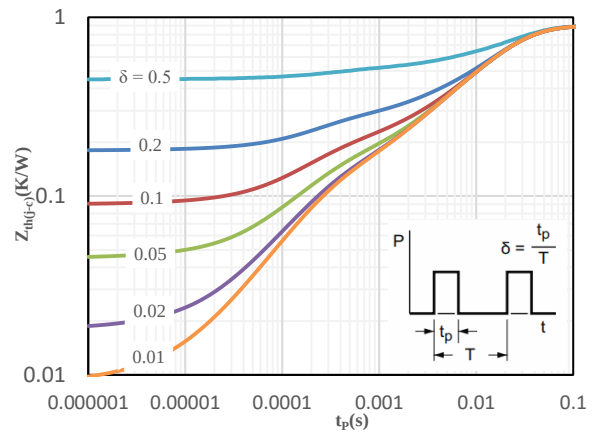
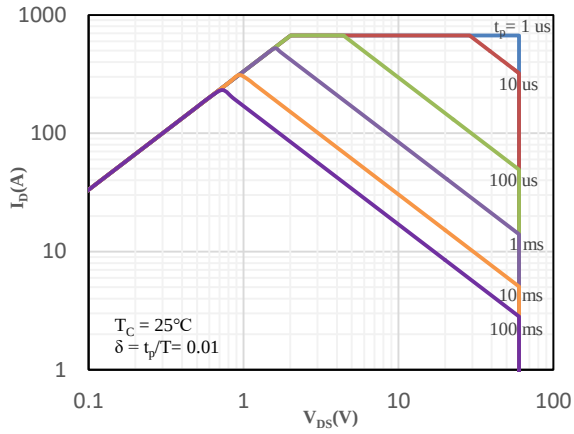
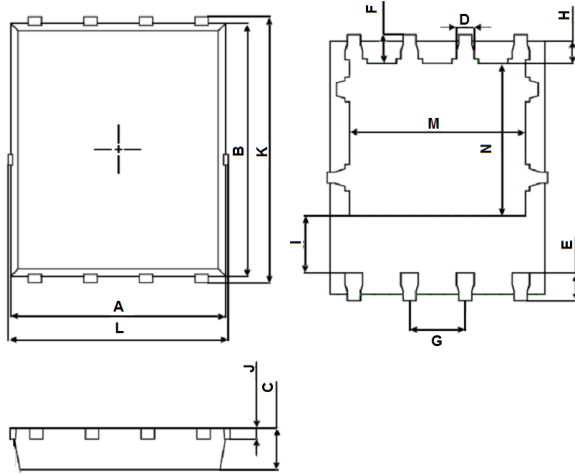


Fig 12 Normalized $V_{GS(th)}$ vs. Junction Temperature



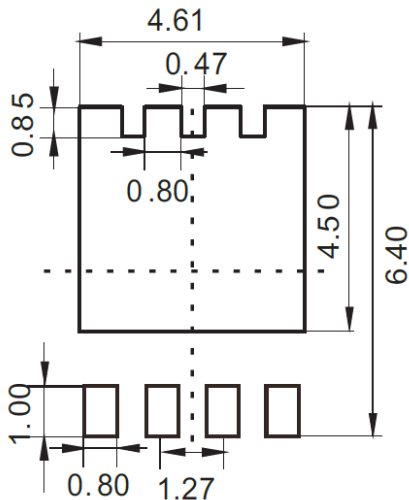
Package Outline Dimensions (Unit: mm)



PDFN5×6-8L		
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)

PDFN5×6-8L



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