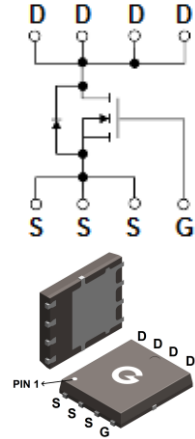


Features

- Advanced shielded-gate trench technology
- Low gate charge minimize switching loss
- Fast recovery body diode
- HBM: AEC-Q101-001: H1A (JESD22-A114-B: 1A)
- RoHS compliant with Halogen-free
- Qualified to AEC-Q101 Standards

HF



PDFN5×6-8L

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

Ordering Information

Part Number	Package	Shipping Quantity	Marking Code
TQBL250N10T-5DL8	PDFN5×6-8L	5000 pcs / Tape & Reel	250N10T

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

Parameter	Symbol	Value	Unit
Drain-to-Source Voltage	V _{DSS}	100	V
Gate-to-Source Voltage	V _{GSS}	±20	V
Continuous Drain Current (T _C = 25°C)	I _D	32	A
Continuous Drain Current (T _C = 100°C)		22	A
Continuous Drain Current (T _A = 25°C)		8	A
Continuous Drain Current (T _A = 100°C)		6	A
Pulsed Drain Current (t _p = 10μs, T _C = 25°C)	I _{DM}	160	A
Single Pulse Avalanche Energy *3	E _{AS}	51	mJ
Power Dissipation (T _C = 25°C)	P _D	57	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}	-	2.32	2.6	°C/W
Thermal Resistance Junction-to-Air *1	R _{θJA}	-	26	35	°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	100	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 100V, V _{GS} = 0V	-	-	1	μA
		V _{DS} = 80V, V _{GS} = 0V, T _J = 125°C	-	-	100	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 = 14A	-	16	25	mΩ
		V _{GS} = 4.5V, I _D = 14A	-	22	35	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = 250μA	1.1	2	2.5	V
g _{fs}	Forward Threshold Voltage	V _{DS} = 5V, I _D = 15A	-	29	-	S
R _G	Gate Resistance	V _{GS} = 0V, f = 1MHz	-	1.7	-	Ω
Dynamic Characteristics						
C _{ISS}	Input Capacitance	V _{GS} = 0V V _{DS} = 30V f = 1.0MHz	-	941	-	pF
C _{OSS}	Output Capacitance		-	419	-	
C _{RSS}	Reverse Transfer Capacitance		-	30	-	
Switching Characteristics						
t _{d(ON)}	Turn-on Delay Time	V _{DD} = 50V V _{GS} = 15V I _D = 14A R _G = 2.2Ω	-	8	-	ns
t _r	Turn-on Rise Time		-	32	-	
t _{d(OFF)}	Turn-Off Delay Time		-	24	-	
t _f	Turn-Off Fall Time		-	24	-	
Q _G	Total Gate-Charge	V _{DS} = 50V V _{GS} = 10V I _D = 14A	-	19.4	-	nC
Q _{GS}	Gate to Source Charge		-	2.7	-	
Q _{GD}	Gate to Drain (Miller) Charge		-	5.1	-	
Source-Drain Diode Characteristics						
V _{SD}	Diode Forward Voltage *2	I _{SD} = 14A, V _{GS} = 0V	-	0.88	1.2	V
t _{rr}	Reverse Recovery Time	I _{SD} = 14A, V _{GS} = 0V	-	40.5	-	ns
Q _{rr}	Reverse Recovery Charge	dI _{SD} /d _t = 100A/μs	-	48	-	nC

Notes:

- The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper
- The data tested by pulsed, pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
- The E_{AS} data shows Max. rating. The test condition is $V_{DD} = 50V, V_{GS} = 10V, L = 0.5mH$

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

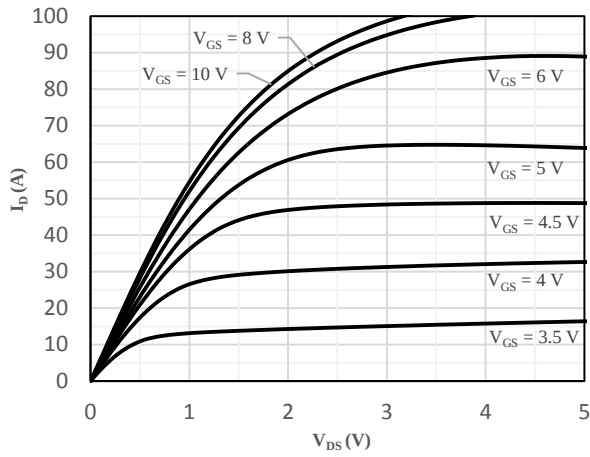


Fig 1 Typical Output Characteristics

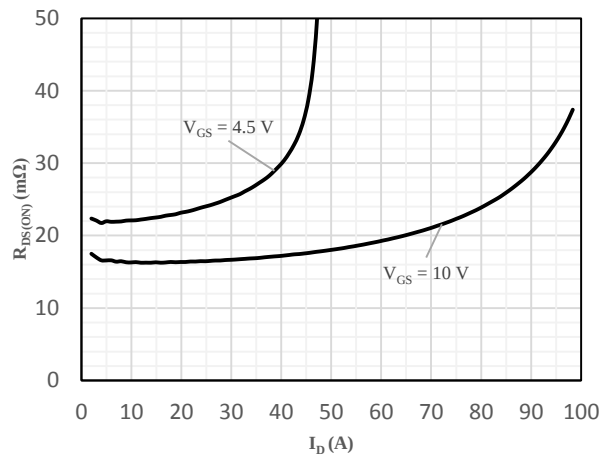


Fig 2 On-Resistance vs. Drain Current
and Gate Voltage

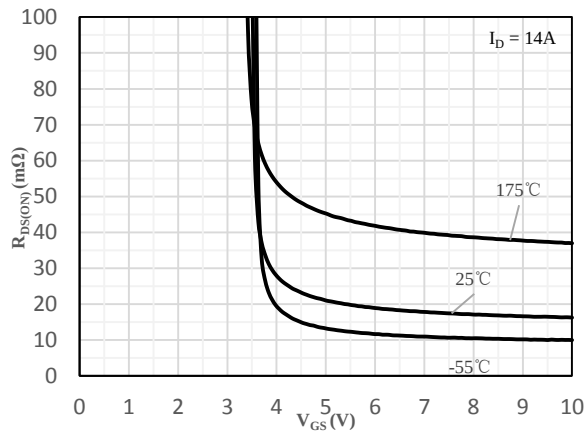


Fig 3 On-Resistance vs. Gate-Source Voltage

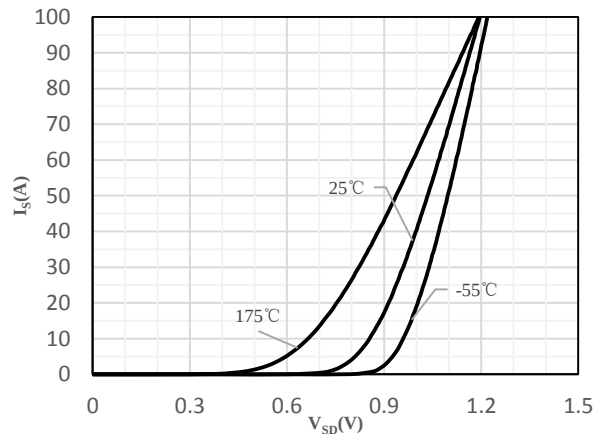


Fig 4 Body-Diode Characteristics

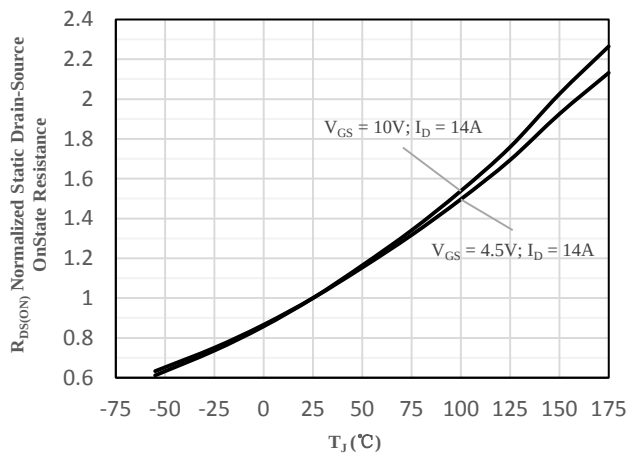


Fig 5 Normalized On-Resistance vs. Junction
Temperature

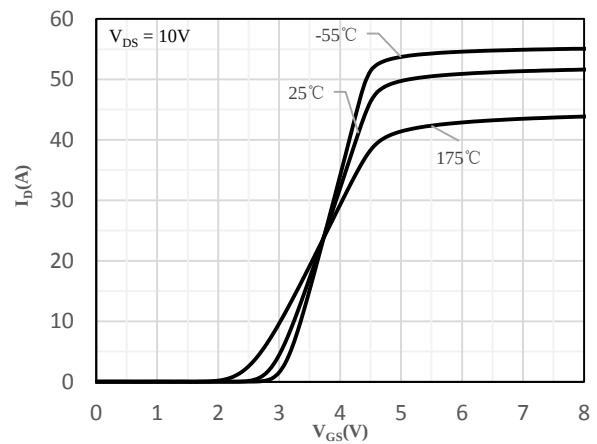


Fig 6 Transfer Characteristics

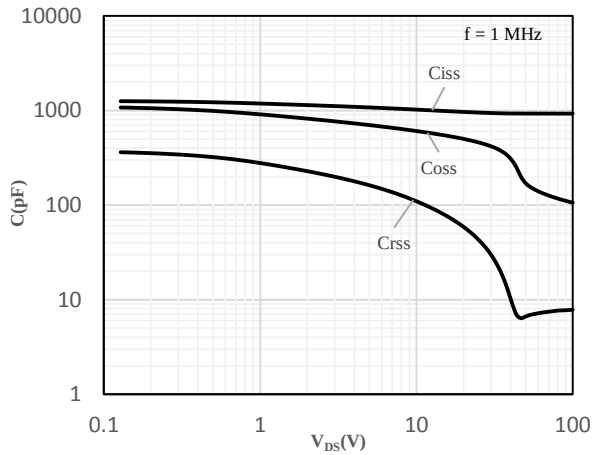


Fig 7 Capacitance Characteristics

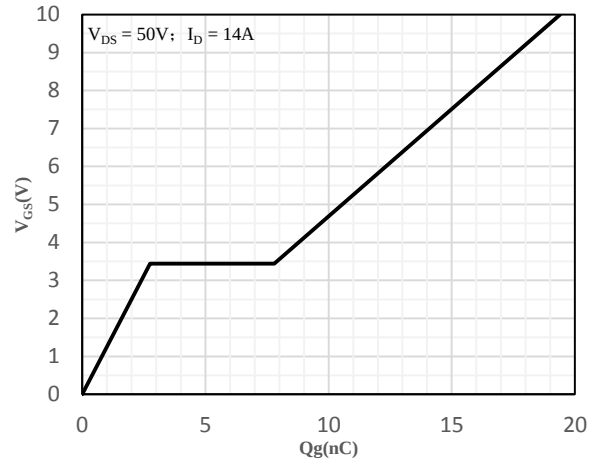


Fig 8 Gate-Charge Characteristics

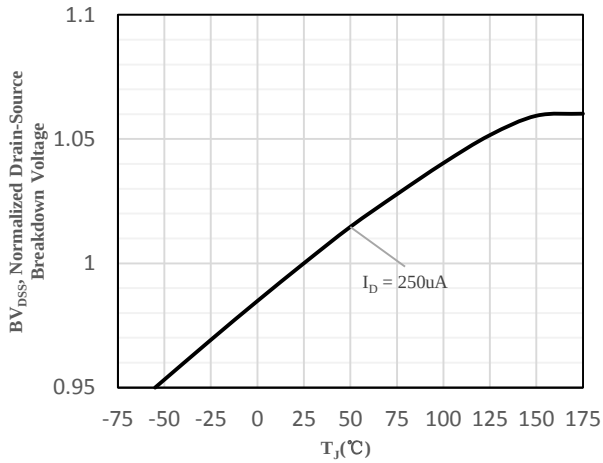


Fig 9 Normalized Breakdown Voltage
vs. Junction Temperature

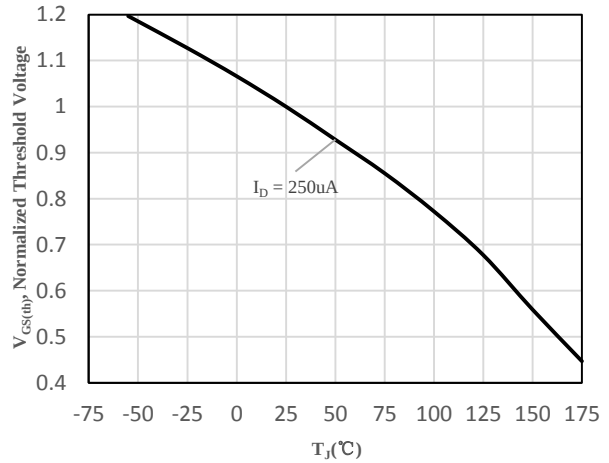


Fig 10 Normalized $V_{GS(th)}$ vs. Junction Temperature

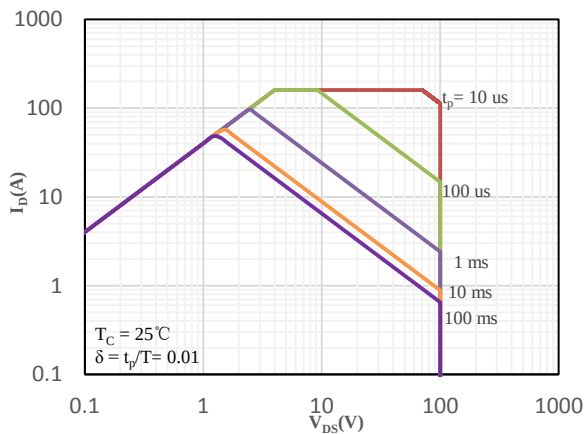


Fig 11 Safe Operation Area

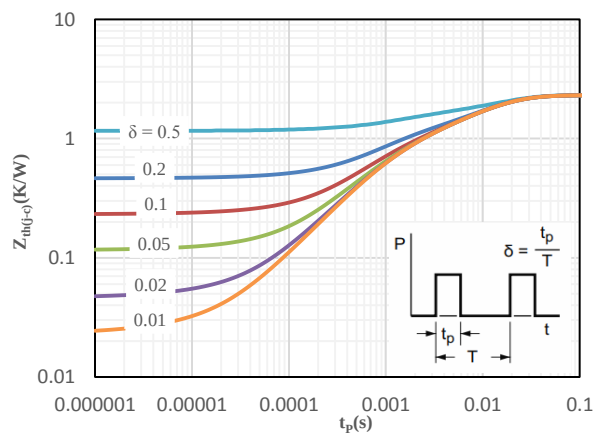
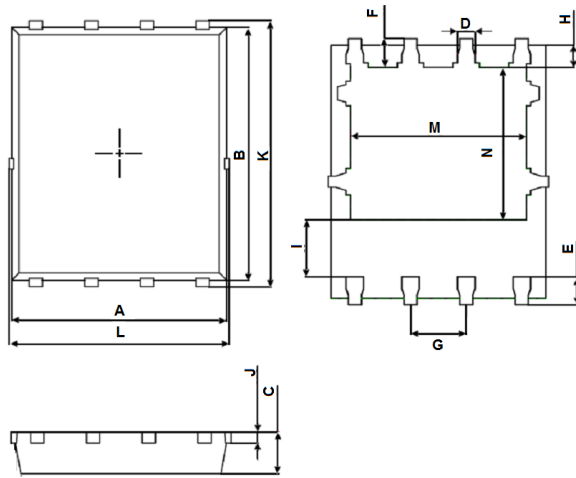


Fig 12 Maximum transient thermal impedance

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

