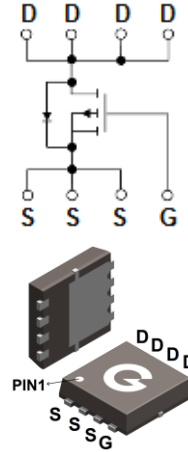


Features

- Advanced trench technology
- Low $R_{DS(ON)}$
- Fast switching speed
- HBM: AEC-Q101-001: H2 (JESD22-A114-B: 2)
- RoHS compliant with Halogen-free
- Qualified to AEC-Q101 Standards

HF



PDFN3×3-8L

Mechanical Data

- Case: PDFN3×3-8L
- Molding Compound, UL Flammability Classification Rating 94V-0
- Terminals: Matte Tin Plated Leads, Solderable Per MIL-STD-202, Method 208

Ordering Information

Part Number	Package	Shipping Quantity	Marking Code
TBL500P06X-3DL8	PDFN3×3-8L	5000 pcs / Tape & Reel	500P06X

Maximum Ratings (@ $T_C = 25^\circ\text{C}$ 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 ($T_C = 25^\circ\text{C}$)	I_D	-18	A
Continuous Drain Current ($T_C = 100^\circ\text{C}$)		-13	
Continuous Drain Current ($T_A = 25^\circ\text{C}$) ^{*1}		-6.1	
Continuous Drain Current ($T_A = 100^\circ\text{C}$) ^{*1}		-4.2	
Pulsed Drain Current ($t_p = 10\mu\text{s}$, $T_C = 25^\circ\text{C}$)	I_{DM}	-108	A
Single Pulse Avalanche Energy ($L = 0.5\text{mH}$) ^{*4}	E_{AS}	45	mJ
Power Dissipation ($T_C = 25^\circ\text{C}$)	P_D	33	W
Power Dissipation ($T_A = 25^\circ\text{C}$) ^{*1}		2.8	
Power Dissipation ($T_A = 25^\circ\text{C}$) ^{*2}		1.2	
Operating Junction Temperature Range	T_J	-55 to +175	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-55 to +175	$^\circ\text{C}$

Thermal Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	-	3	4.5	$^\circ\text{C/W}$
Thermal Resistance Junction-to-Air ^{*1}	$R_{\theta JA}$	-	36	54	$^\circ\text{C/W}$
Thermal Resistance Junction-to-Air ^{*2}		-	90	125	

Electrical Characteristics (@ $T_A = 25^\circ\text{C}$ 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 *3	V _{GS} = -10V,I _D = -7A	-	32	50	mΩ
		V _{GS} = -4.5V,I _D = -7A	-	40	70	
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = -250μA	-1	-1.5	-3	V
R _G	Gate Resistance	V _{GS} = 0V, f = 1MHz	-	10	-	Ω
Dynamic Characteristics						
C _{ISS}	Input Capacitance	V _{GS} = 0V V _{DS} = -30V f = 1.0MHz	-	1902	-	pF
C _{OSS}	Output Capacitance		-	104	-	
C _{RSS}	Reverse Transfer Capacitance		-	83	-	
Switching Characteristics						
t _{d(ON)}	Turn-on Delay Time *5	V _{DD} = -30V V _{GS} = -10V R _G = 3Ω I _D = -5A	-	4.3	-	ns
t _r	Turn-on Rise Time *5		-	6.3	-	
t _{d(OFF)}	Turn-Off Delay Time *5		-	46.7	-	
t _f	Turn-Off Fall Time *5		-	25.3	-	
Q _G	Total Gate-Charge	V _{DD} = -30V I _D = -5A V _{GS} = -10V	-	37	-	nC
Q _{GS}	Gate to Source Charge		-	5.5	-	
Q _{GD}	Gate to Drain (“Miller”) Charge		-	6	-	
Source-Drain Diode Characteristics						
V _{SD}	Diode Forward Voltage *3	I _{SD} = -1A, V _{GS} = 0V	-	-0.7	-1.2	V
t _{rr}	Reverse Recovery Time	I _{SD} = -5A, V _{GS} = 0V di/dt = 100A/μs	-	28	-	ns
Q _{rr}	Reverse Recovery Charge		-	17	-	nC

Notes:

1. The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper
2. The data tested by surface mounted on a minimum recommended FR-4 board
3. The data tested by pulsed, pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
4. The E_{AS} data shows Max. rating. The test condition is $V_{DD} = -30V, V_{GS} = -10V, L = 0.5mH$
5. Guaranteed by design, not subject to production

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

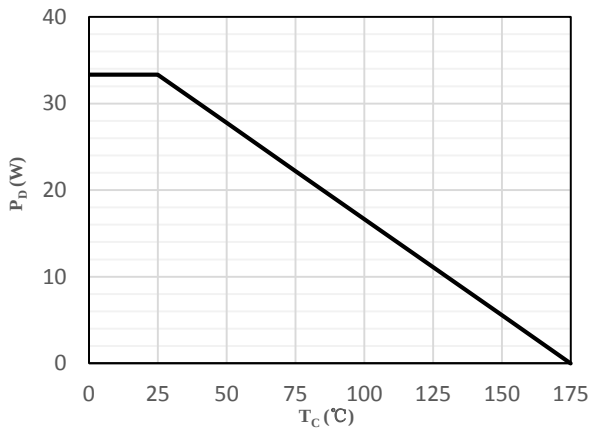


Fig 1 Power Dissipation

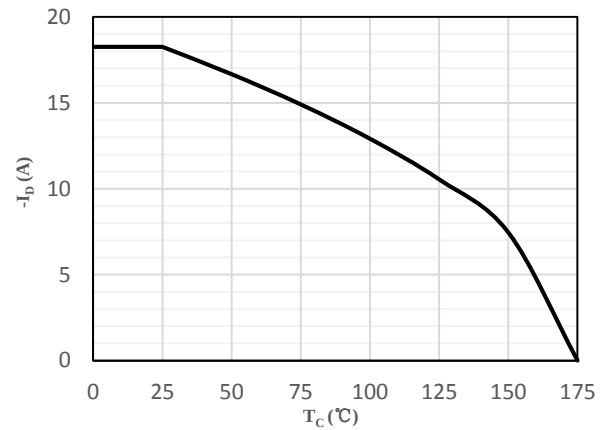


Fig 2 Drain Current

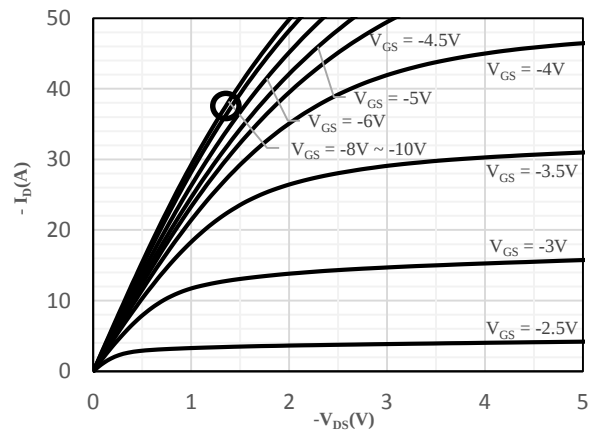


Fig 3 Typical Output Characteristics

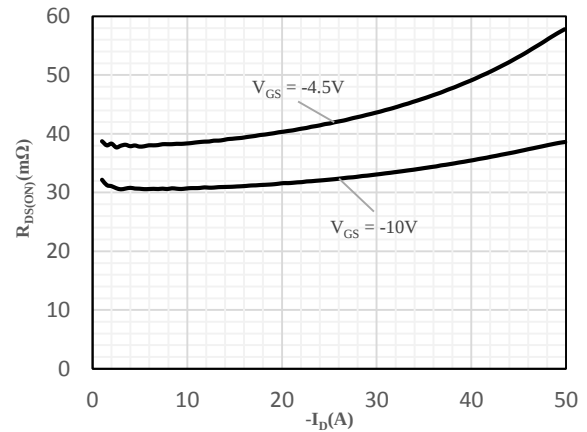


Fig 4 On-Resistance vs. Drain Current and Gate Voltage

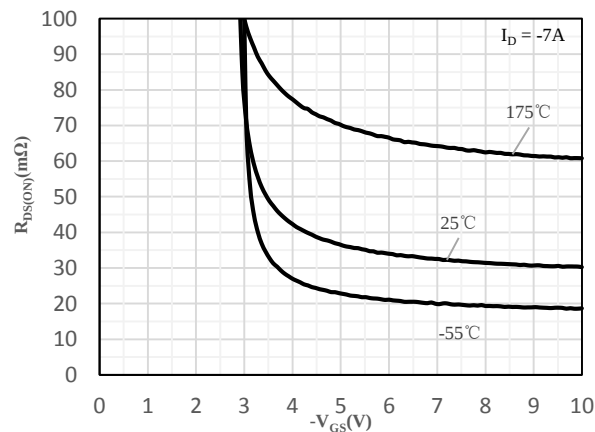


Fig 5 On-Resistance vs. Gate-Source Voltage

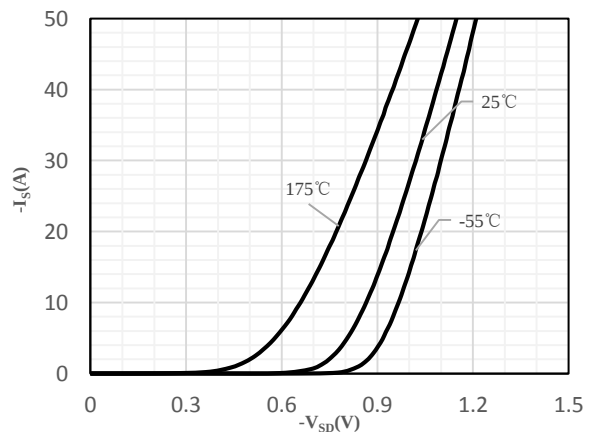


Fig 6 Body-Diode Characteristics

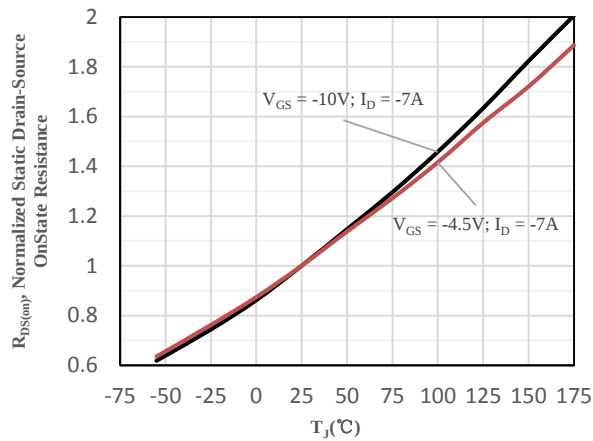


Fig 7 Normalized On-Resistance vs. Junction Temperature

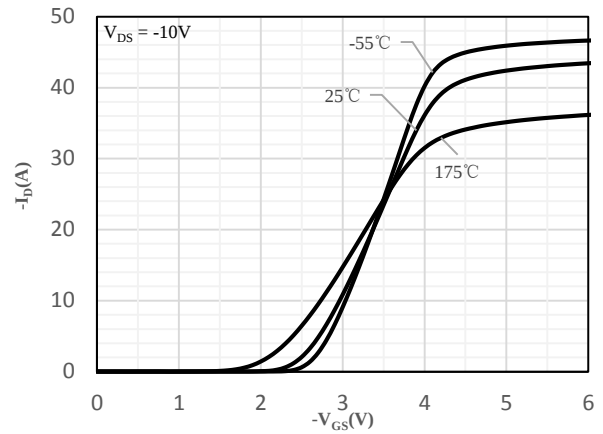


Fig 8 Transfer Characteristics

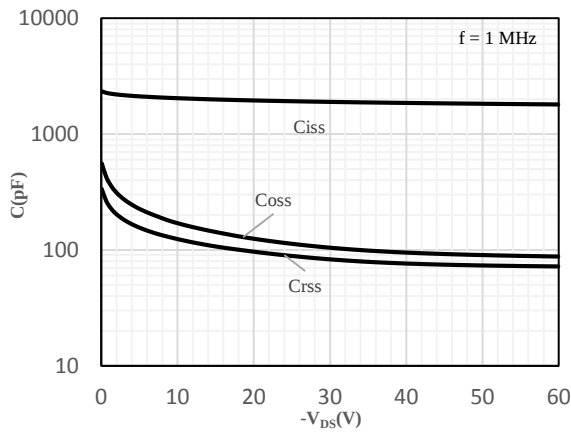


Fig 9 Capacitance Characteristics

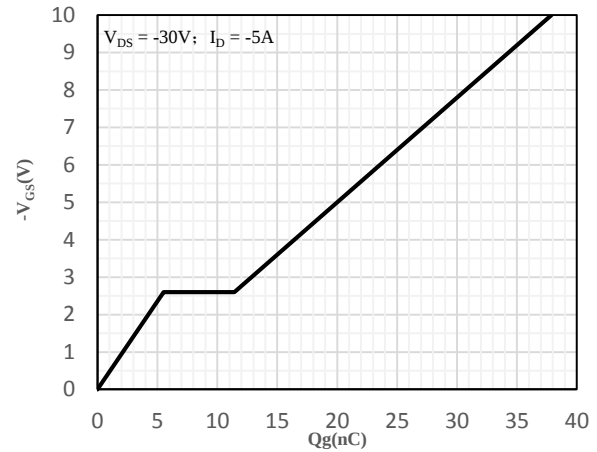


Fig 10 Gate-Charge Characteristics

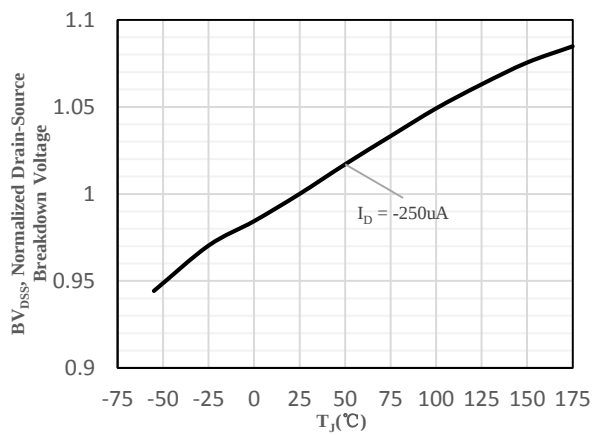


Fig 11 Normalized Breakdown Voltage vs. Junction Temperature

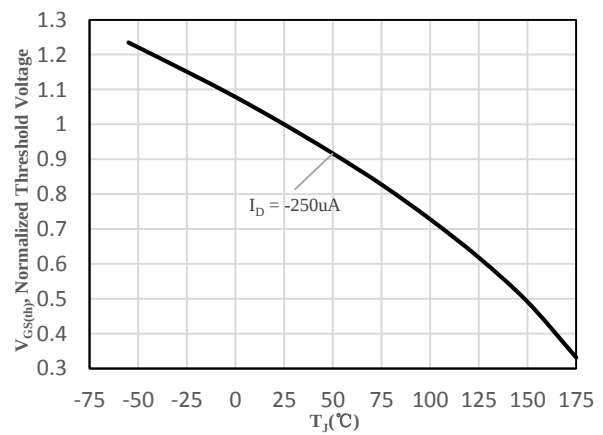


Fig 12 Normalized $V_{GS(th)}$ vs. Junction Temperature

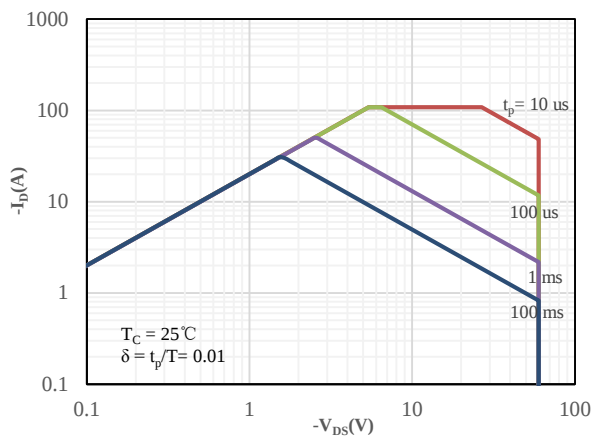


Fig 13 Safe Operation Area

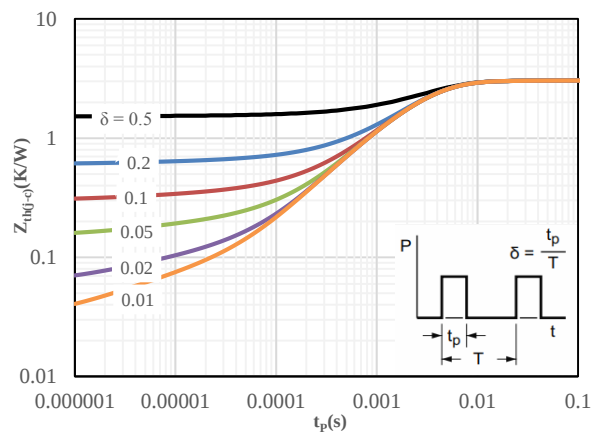
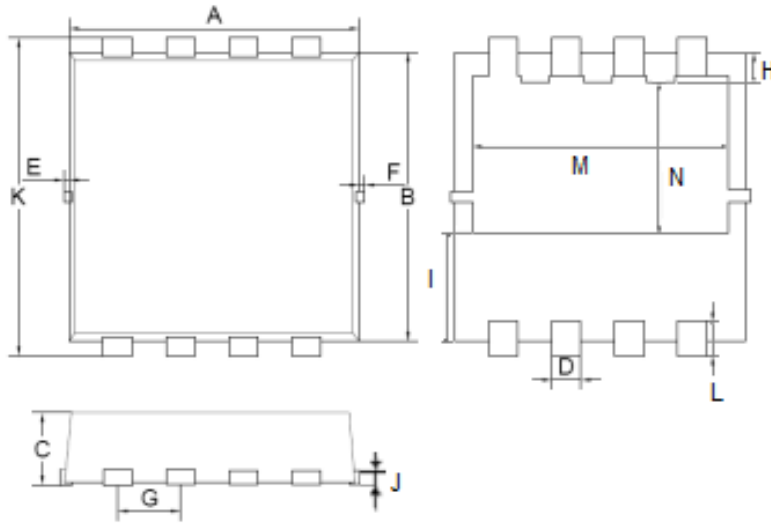


Fig 14 Maximum transient thermal impedance

Package Outline Dimensions (Unit: mm)



PDFN3x3-8L		
Dimension	Min.	Max.
A	2.90	3.10
B	2.90	3.10
C	0.65	0.85
D	0.20	0.40
E	0.00	0.10
F	0.00	0.10
G	0.55	0.75
H	0.20	0.40
I	0.70	1.10
J	0.10	0.20
K	3.15	3.45
L	0.20	0.40
M	2.35	2.55
N	1.500	1.900

Mounting Pad Layout (Unit: mm)

PDFN3x3-8L

