

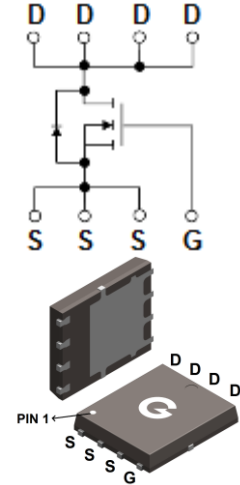
Features

- Advanced shielded-gate technology
- Ultra low $R_{DS(ON)}$ to minimize conduction losses
- Superior thermal resistance
- HBM: AEC-Q101-001: H1C (JESD22-A114-B: 1C)
- 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
TBLS012N04TH-5DL8	PDFN5×6-8L	5000 pcs / Tape & Reel	012N04TH

Maximum Ratings (@ $T_C = 25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-to-Source Voltage	V_{DSS}	40	V
Gate-to-Source Voltage	V_{GSS}	± 20	V
Continuous Drain Current ($T_C = 25^\circ\text{C}$, Silicon limited) ^{*1}	I_D	270	A
Continuous Drain Current ($T_C = 100^\circ\text{C}$, Silicon limited) ^{*1}		190	A
Continuous Drain Current ($T_A = 25^\circ\text{C}$) ^{*2}		43	A
Continuous Drain Current ($T_A = 100^\circ\text{C}$) ^{*2}		30	A
Pulsed Drain Current ($t_p = 10\mu\text{s}$, $T_C = 25^\circ\text{C}$) ^{*1}	I_{DM}	1080	A
Single Pulse Avalanche Energy ^{*3}	E_{AS}	500	mJ
Power Dissipation ($T_C = 25^\circ\text{C}$)	P_D	150	W
Power Dissipation ($T_A = 25^\circ\text{C}$) ^{*2}		3.8	W
Operating Junction Temperature Range	T_J	$-55 \sim +175$	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	$-55 \sim +175$	$^\circ\text{C}$

Thermal Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	-	0.8	1	$^\circ\text{C/W}$
Thermal Resistance Junction-to-Air ^{*2}	$R_{\theta JA}$	-	34	40	$^\circ\text{C/W}$

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 = 1mA	40	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 40V, 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 *4	V _{GS} = 10V, I _D = 75A	-	0.95	1.2	mΩ
		V _{GS} = 7V, I _D = 75A	-	1.2	1.6	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = 250μA	2	3	4	V
R _G	Gate Resistance	V _{GS} = 0V, f = 1MHz	-	4.9	-	Ω
Dynamic Characteristics						
C _{ISS}	Input Capacitance	V _{GS} = 0V V _{DS} = 25V f = 300KHz	-	5593	-	pF
C _{OSS}	Output Capacitance		-	1652	-	
C _{RSS}	Reverse Transfer Capacitance		-	7	-	
Switching Characteristics						
t _{d(ON)}	Turn-on Delay Time	V _{DD} = 30V V _{GS} = 15V R _G = 3.3Ω I _D = 40A	-	25	-	ns
t _r	Turn-on Rise Time		-	95	-	
t _{d(OFF)}	Turn-Off Delay Time		-	145	-	
t _f	Turn-Off Fall Time		-	109	-	
Q _G	Total Gate-Charge	V _{DD} = 32V V _{GS} = 10V I _D = 75A	-	67	-	nC
Q _{GS}	Gate to Source Charge		-	24	-	
Q _{GD}	Gate to Drain (Miller) Charge		-	7	-	
Source-Drain Diode Characteristics						
V _{SD}	Diode Forward Voltage *4	I _S = 75A, V _{GS} = 0V	-	0.83	1.2	V
t _{rr}	Reverse Recovery Time	I _S = 40A, V _{GS} = 0V di/dt = 100A/μs	-	130	-	ns
Q _{rr}	Reverse Recovery Charge		-	215	-	nC

Notes:

- The entire application environment impacts the thermal resistance values shown, they are not constants and are only valid for the particular conditions noted. De-rating will be required based on the actual environmental conditions
- The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper
- The E_{AS} data shows Max. rating. The test condition is $V_{DD} = 30V, V_{GS} = 10V, L = 0.5mH$
- The data tested by pulsed, pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$

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

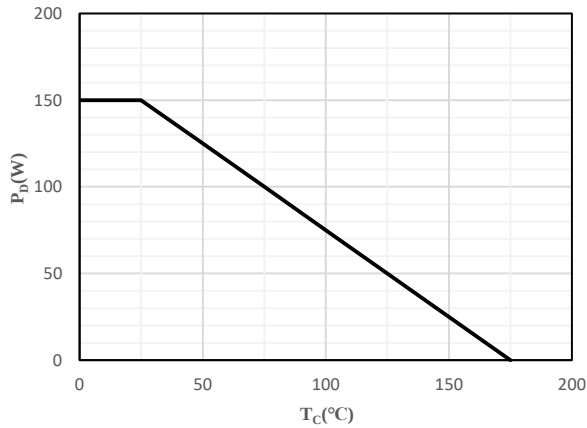


Fig 1 Power Dissipation

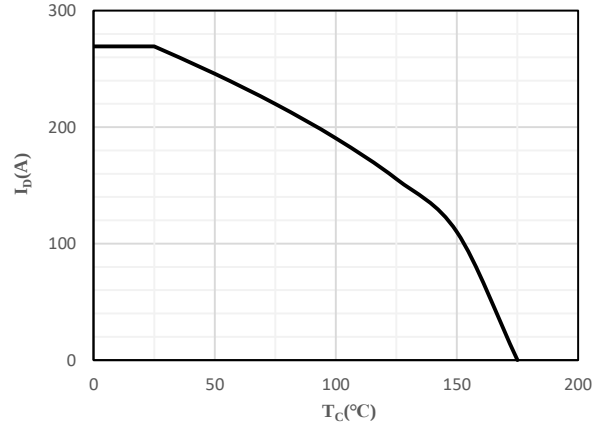


Fig 2 Drain Current

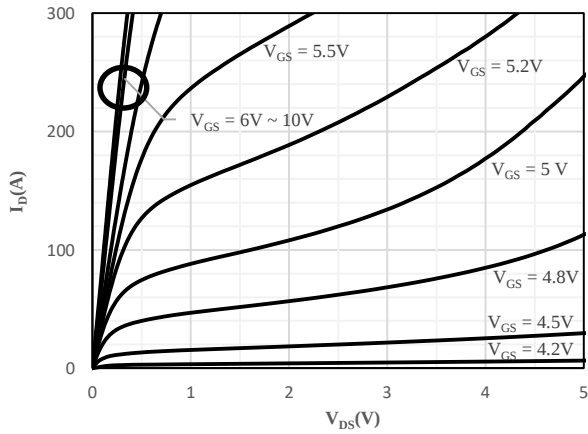


Fig 3 Typical Output Characteristics

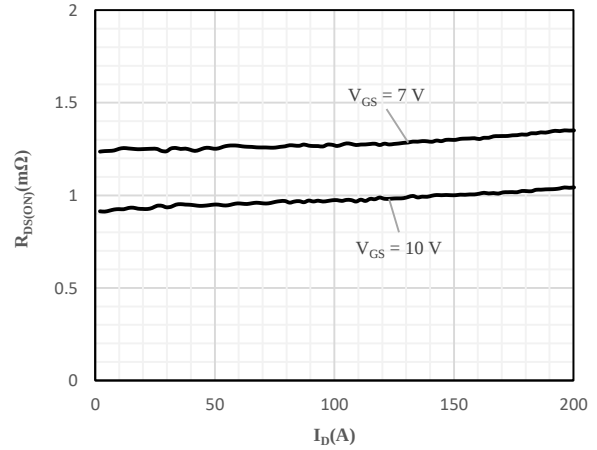


Fig 4 On-Resistance vs. Drain Current and Gate Voltage

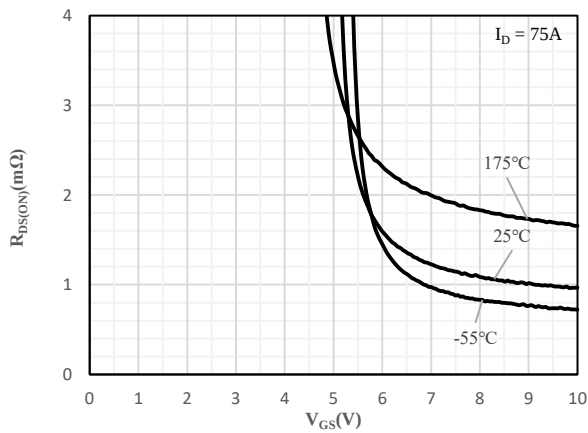


Fig 5 On-Resistance vs. Gate-Source Voltage

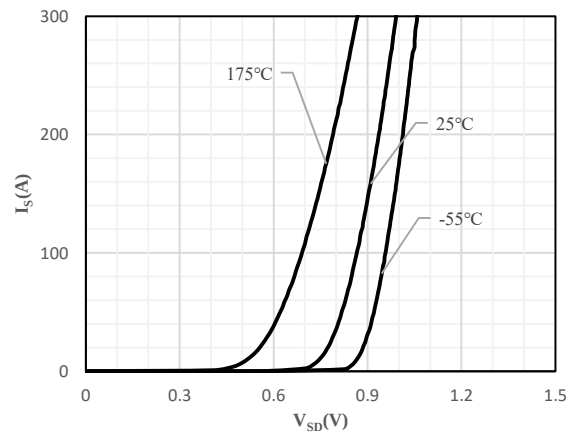


Fig 6 Body-Diode Characteristics

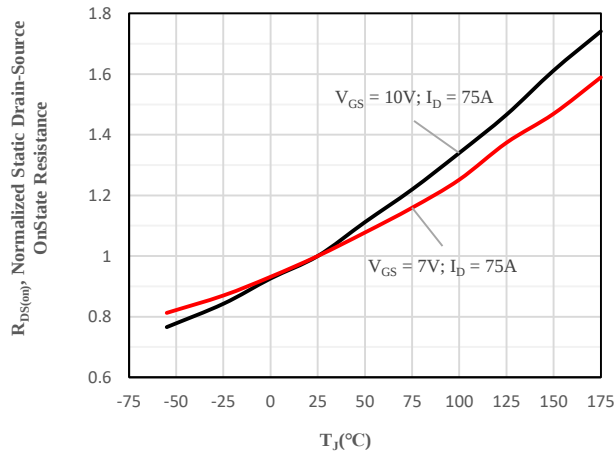


Fig 7 Normalized On-Resistance vs. Junction Temperature

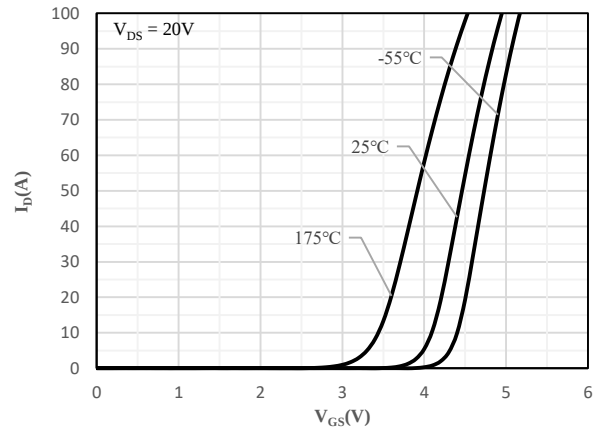


Fig 8 Transfer Characteristics

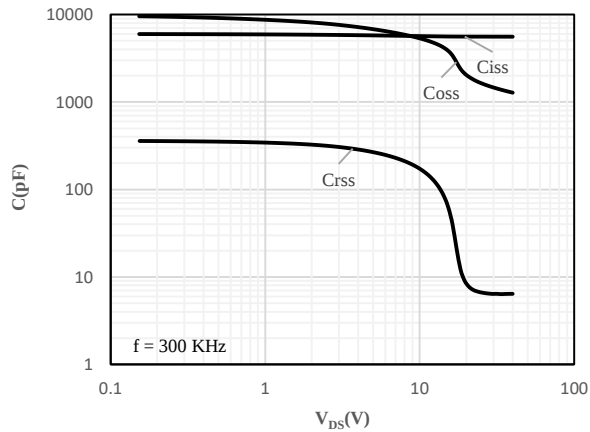


Fig 9 Capacitance Characteristics

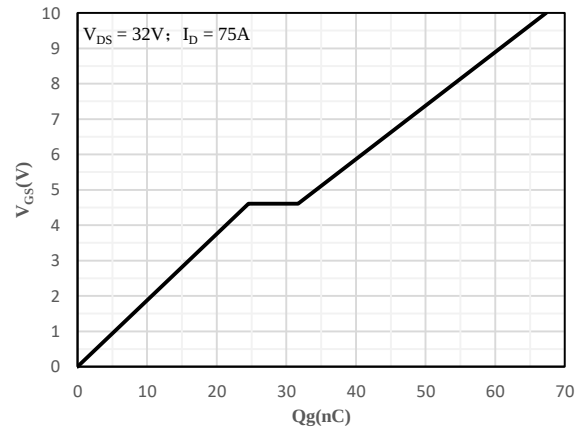


Fig 10 Gate-Charge Characteristics

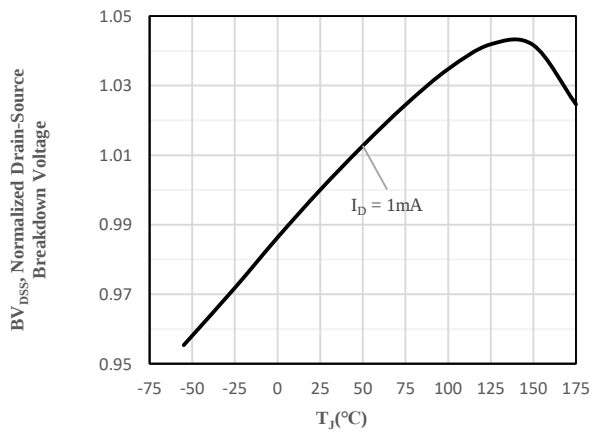


Fig 11 Normalized Breakdown Voltage vs. Junction Temperature

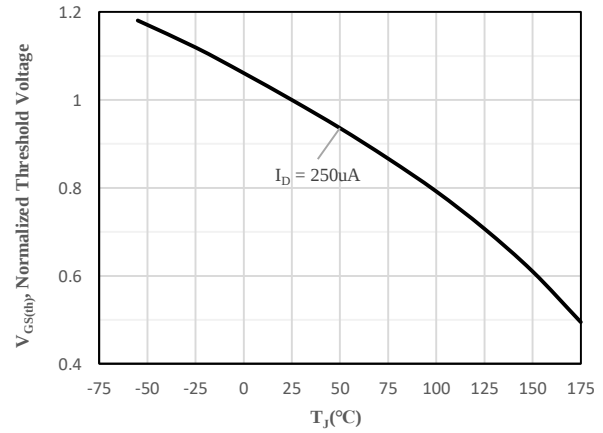
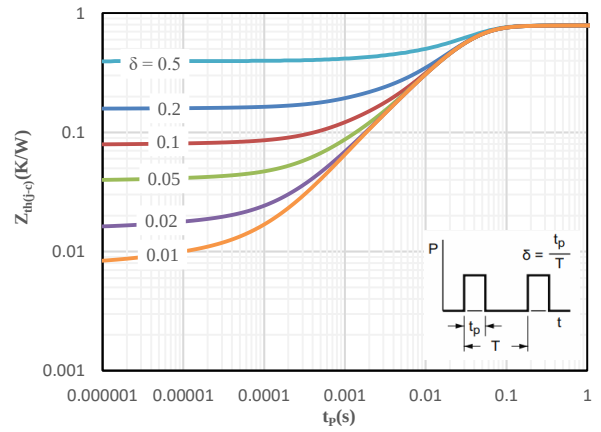
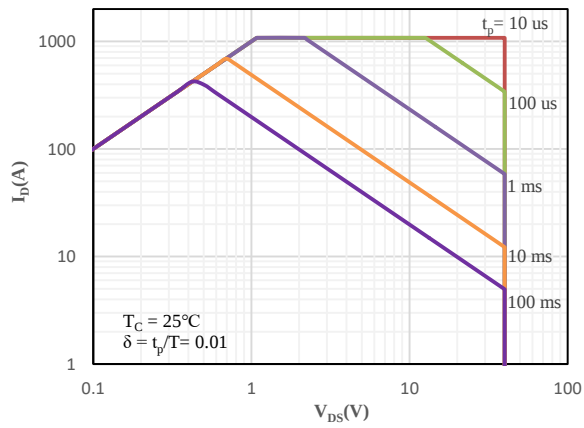
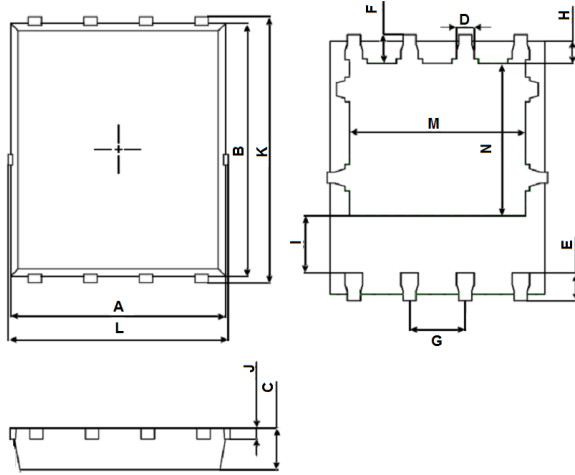


Fig 12 Normalized $V_{GS(th)}$ vs. Junction Temperature



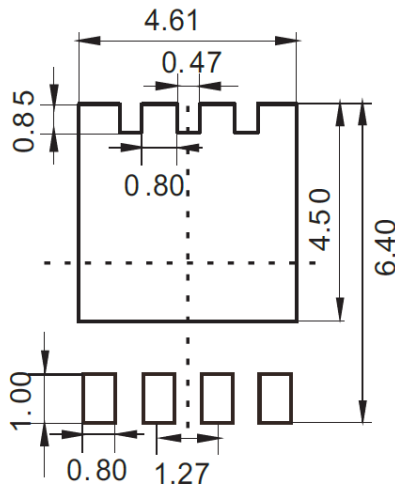
Package Outline Dimensions (Unit: mm)



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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