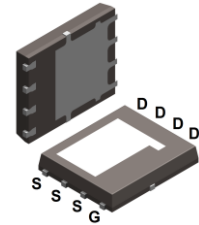
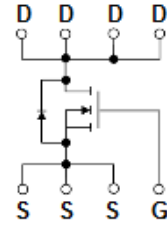


Features

- Advanced dual-side cooled package
- Ultra low $R_{DS(ON)}$ to minimize conduction losses
- Superior thermal resistance
- HBM: AEC-Q101-001: H2 (JESD22-A114-B: 2)
- RoHS compliant with Halogen-free
- Qualified to AEC-Q101 Standards

HF



PDFN5x6DSC

Mechanical Data

- Case: PDFN5x6DSC
- 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
TBLS009N04THSC	PDFN5x6DSC	5000 pcs / Tape & Reel	00904

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

Parameter	Symbol	Value	Unit
Drain-to-Source Voltage	V_{DS}	40	V
Gate-to-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ($T_C = 25^\circ\text{C}$, Silicon limited) *1	I_D	320	A
Continuous Drain Current ($T_C = 100^\circ\text{C}$, Silicon limited) *1		226	A
Continuous Drain Current ($T_A = 25^\circ\text{C}$) *2		51	A
Continuous Drain Current ($T_A = 100^\circ\text{C}$) *2		36	A
Pulsed Drain Current ($t_p = 10\mu\text{s}$, $T_C = 25^\circ\text{C}$) *1	I_{DM}	1280	A
Single Pulse Avalanche Energy *3	E_{AS}	600	mJ
Power Dissipation ($T_C = 25^\circ\text{C}$)	P_D	167	W
Power Dissipation ($T_A = 25^\circ\text{C}$) *2		4.3	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, Bottom	$R_{\theta JC}$	-	0.85	0.9	$^\circ\text{C/W}$
Thermal Resistance Junction-to-Case, Top		-	-	1.0	$^\circ\text{C/W}$
Thermal Resistance Junction-to-Air *2	$R_{\theta JA}$	-	23	35	$^\circ\text{C/W}$

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

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
V _{DS}	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	-	0.6	0.9	mΩ
		V _{GS} = 6V,I _D = 75A	-	0.95	1.4	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = 250μA	2	2.8	4	V
R _G	Gate Resistance	V _{GS} = 0V, f = 1MHz	-	1.9	-	Ω
Dynamic Characteristics						
C _{ISS}	Input Capacitance	V _{GS} = 0V	-	6518	-	pF
C _{OSS}	Output Capacitance	V _{DS} = 25V	-	1697	-	
C _{RSS}	Reverse Transfer Capacitance	f = 300KHz	-	137	-	
Switching Characteristics						
t _{d(ON)}	Turn-on Delay Time	V _{DD} = 30V	-	36	-	ns
t _r	Turn-on Rise Time	V _{GS} = 15V	-	97	-	
t _{d(OFF)}	Turn-Off Delay Time	I _D = 40A	-	115	-	
t _f	Turn-Off Fall Time	R _G = 3.3Ω	-	100	-	
Q _G	Total Gate-Charge	V _{DD} = 32V	-	108	-	nC
Q _{GS}	Gate to Source Charge	V _{GS} = 10V	-	25	-	
Q _{GD}	Gate to Drain (Miller) Charge	I _D = 75A	-	26	-	
Source-Drain Diode Characteristics						
V _{SD}	Diode Forward Voltage *4	I _S = 75A, V _{GS} = 0V	-	0.8	1.2	V
t _{rr}	Reverse Recovery Time	I _S = 40A, V _{GS} = 0V	-	88	-	ns
Q _{rr}	Reverse Recovery Charge	di/dt = 100A/μs	-	145	-	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)

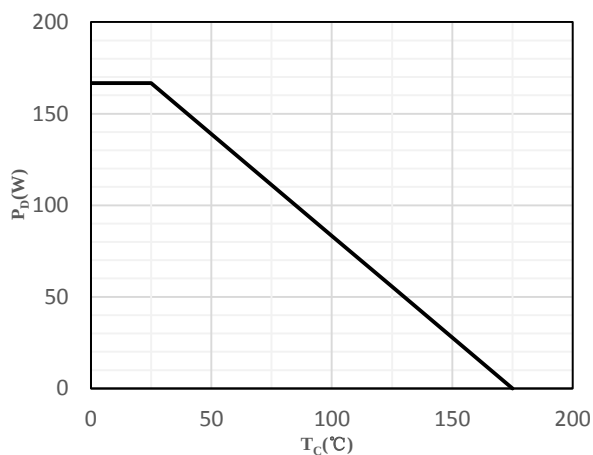


Fig 1 Power Dissipation

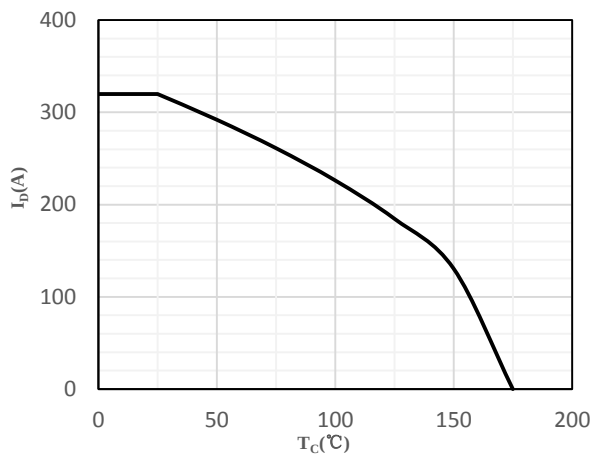


Fig 2 Drain Current

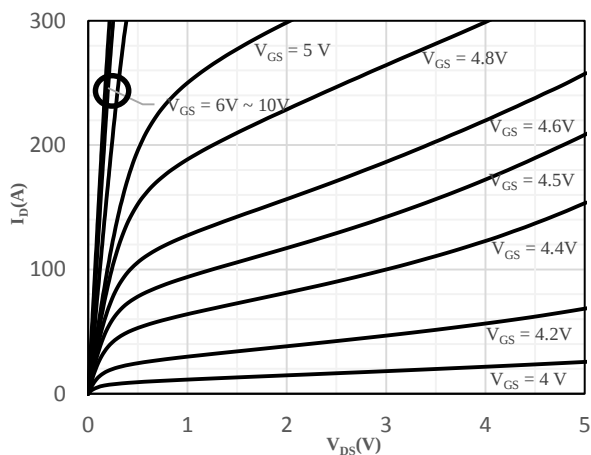


Fig 3 Typical Output Characteristics

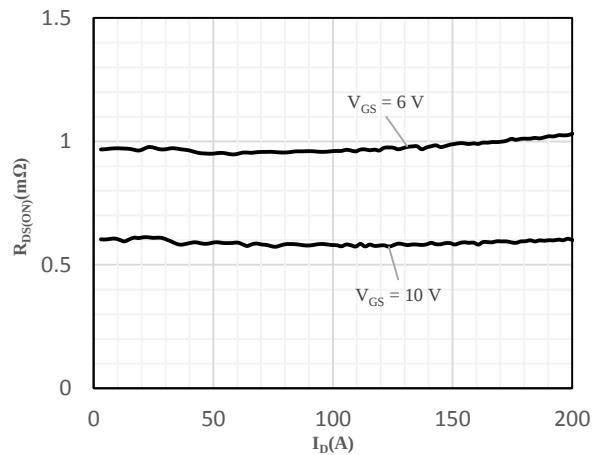


Fig 4 On-Resistance vs. Drain Current and Gate Voltage

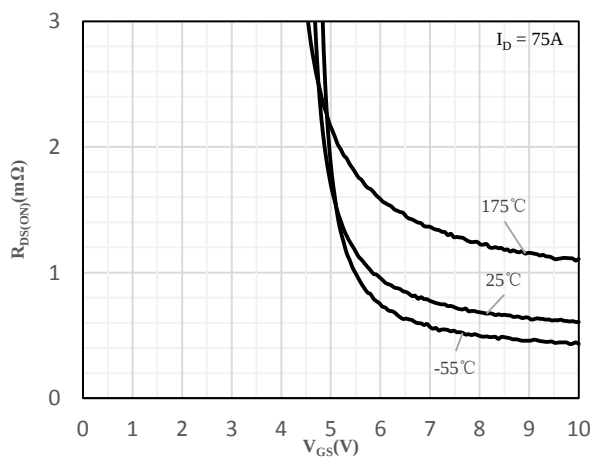


Fig 5 On-Resistance vs. Gate-Source Voltage

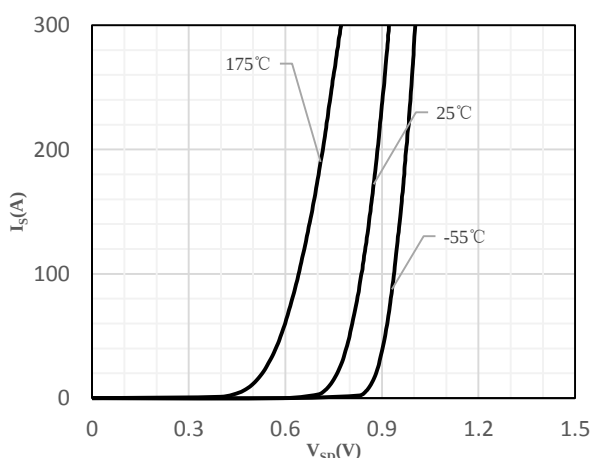


Fig 6 Body-Diode Characteristics

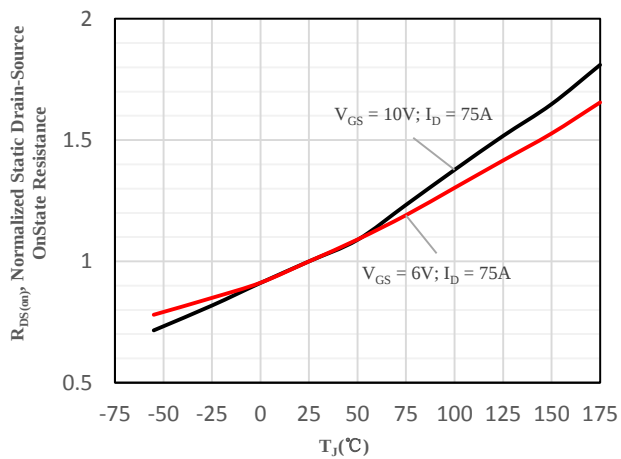


Fig 7 Normalized On-Resistance vs. Junction Temperature

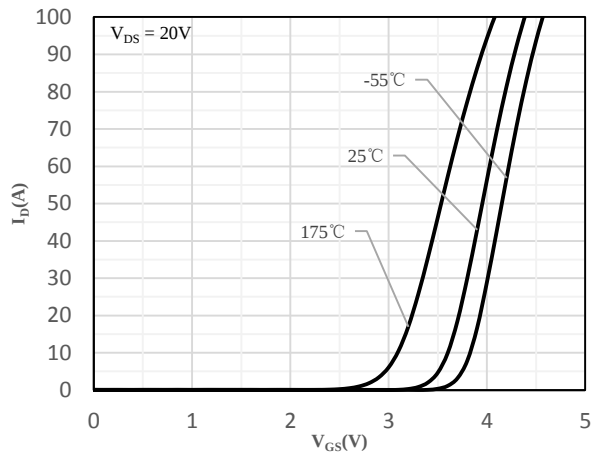


Fig 8 Transfer Characteristics

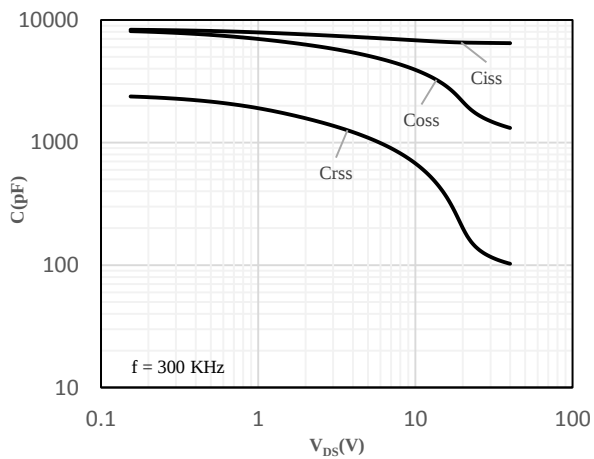


Fig 9 Capacitance Characteristics

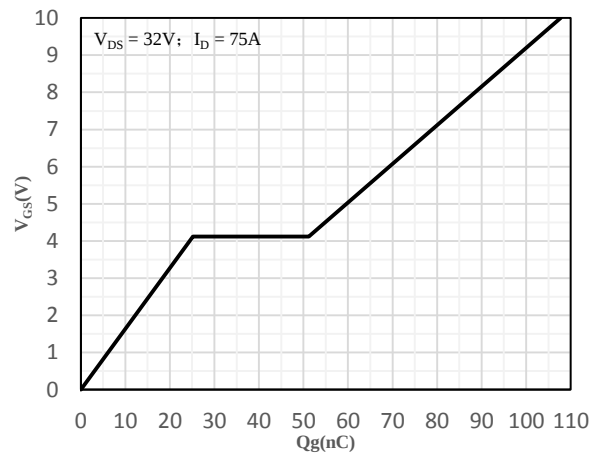


Fig 10 Gate-Charge Characteristics

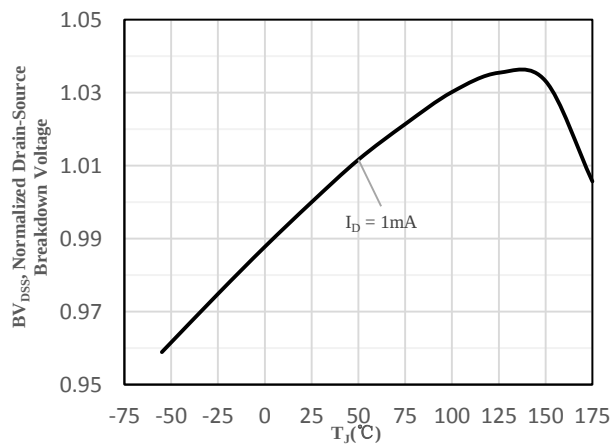


Fig 11 Normalized Breakdown Voltage vs. Junction Temperature

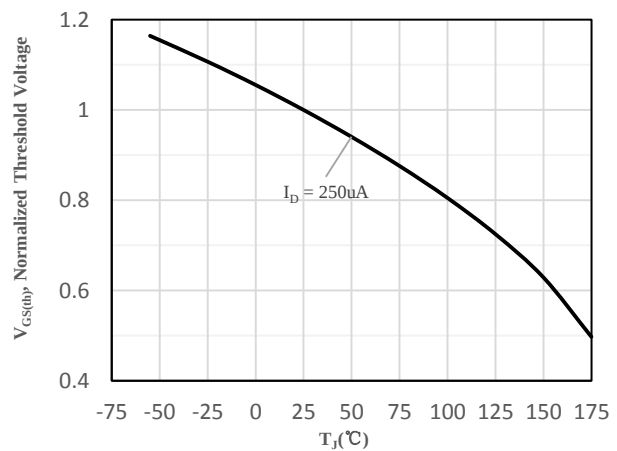


Fig 12 Normalized $V_{GS(th)}$ vs. Junction Temperature

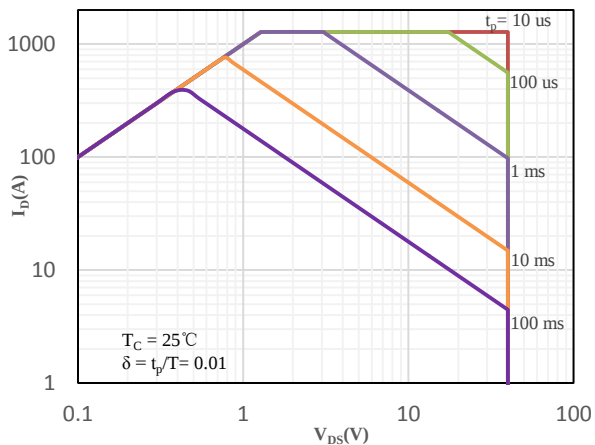


Fig 13 Safe Operation Area

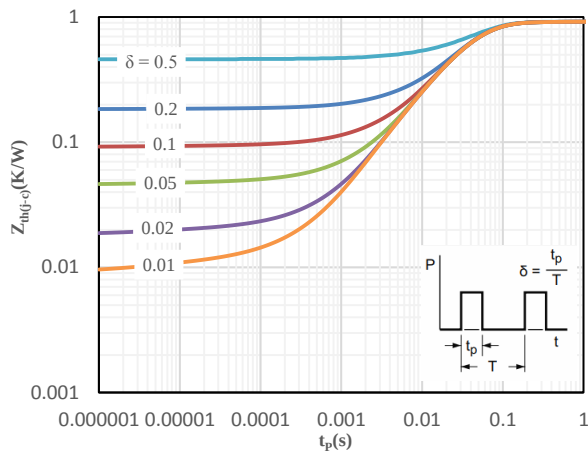
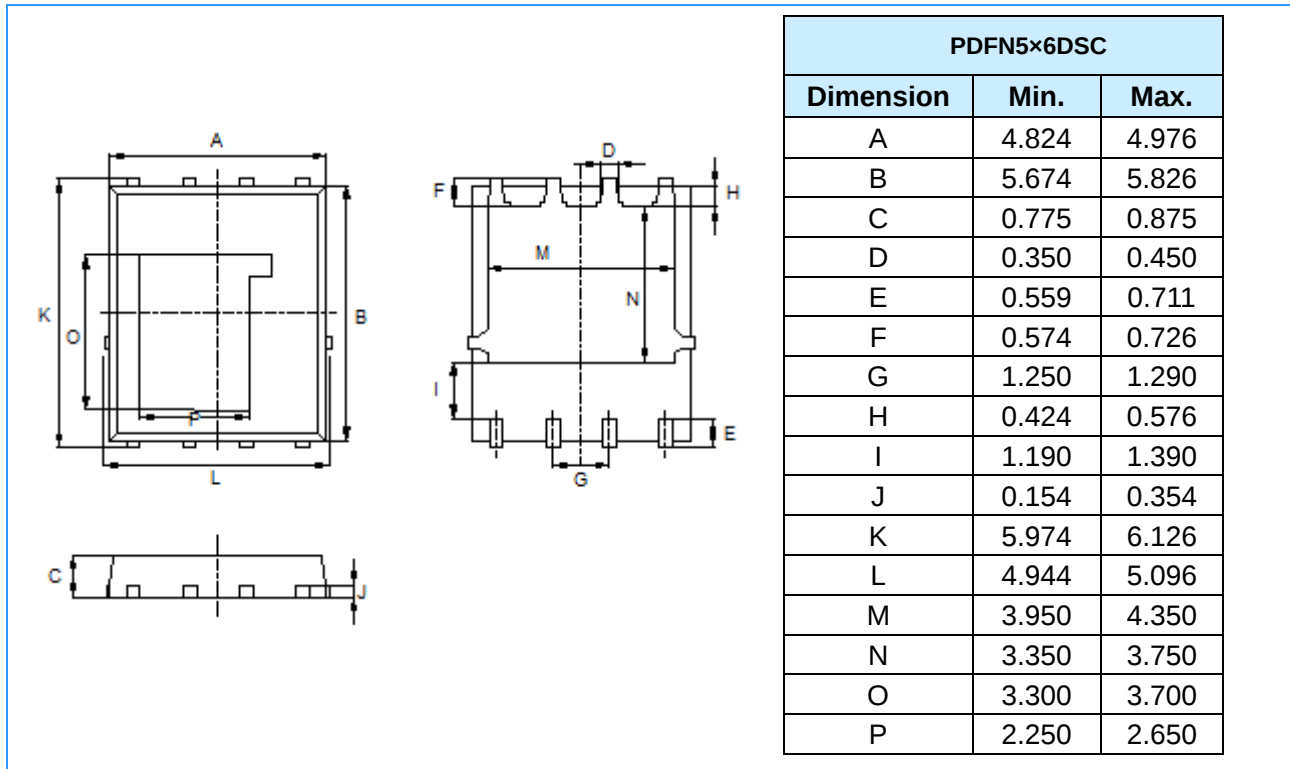


Fig 14 Maximum transient thermal impedance

Package Outline Dimensions (Unit: mm)



Mounting Pad Layout (Unit: mm)

