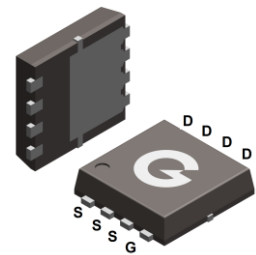
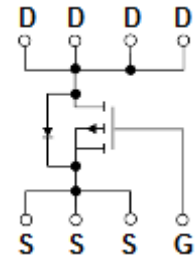


Features

- High power and current handling capability
- JESD22-A114-B ESD rating of class 1C per human body model
- Halogen free
- Qualified to AEC-Q101 standards for high reliability

HF



PDFN3×3-8L

Typical Applications

- Load switch
- Power management functions
- PWM Applications

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
TBL13P06-3DL8	PDFN3×3-8L	5000 pcs / Tape & Reel	13P06

Maximum Ratings (@ T_C = 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	-13.5	A
Continuous Drain Current (T _C = 100°C)		-8	A
Continuous Drain Current (T _A = 25°C) *1		-3.1	A
Continuous Drain Current (T _A = 100°C) *1		-2	A
Pulsed Drain Current (t _p = 10μs, T _A = 25°C)	I _{DM}	-23	A
Single Pulse Avalanche Energy *4	E _{AS}	14	mJ
Power Dissipation (T _C = 25°C)	P _D	42	W
Operating Junction Temperature Range	T _J	-55 ~ +150	°C
Storage Temperature Range	T _{STG}	-55 ~ +150	°C

Thermal Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	-	-	3	$^{\circ}\text{C/W}$
Thermal Resistance Junction-to-Air ^{*1}	$R_{\theta JA}$	-	54	70	$^{\circ}\text{C/W}$
Thermal Resistance Junction-to-Air ^{*2}		-	-	135	$^{\circ}\text{C/W}$

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

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
V _{BSS}	Drain-Source Breakdown Voltage	V _{GS} = 0V, I _D = -250μA	-60	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = -48V, 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 = -5.7A	-	75	100	mΩ
		V _{GS} = -4.5V, I _D = -4.4A	-	93	125	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = -250μA	-1	-1.6	-2.5	V
R _G	Gate Resistance	V _{GS} = 0V, f = 1MHz	-	17	-	Ω
Dynamic Characteristics						
C _{ISS}	Input Capacitance	V _{GS} = 0V V _{DS} = -25V f = 1.0MHz	-	936	-	pF
C _{OSS}	Output Capacitance		-	55	-	
C _{RSS}	Reverse Transfer Capacitance		-	41	-	
Switching Characteristics						
t _{d(ON)}	Turn-on Delay Time *5	V _{DD} = -30V V _{GS} = -10V R _G = 3Ω R _L = 7.5Ω	-	8	-	ns
t _r	Turn-on Rise Time *5		-	4	-	
t _{d(OFF)}	Turn-Off Delay Time *5		-	32	-	
t _f	Turn-Off Fall Time *5		-	7	-	
Q _G	Total Gate-Charge	V _{DD} = -30V I _D = -4A V _{GS} = -10V	-	21	-	nC
Q _{GS}	Gate to Source Charge		-	3.1	-	
Q _{GD}	Gate to Drain (“Miller”) Charge		-	3.2	-	
Source-Drain Diode Characteristics						
V _{SD}	Diode Forward Voltage *3	I _{SD} = -13A, V _{GS} = 0V	-	-1	-1.2	V
t _{rr}	Reverse Recovery Time	I _F = -4A, V _{GS} = 0V di/dt = 100A/μs	-	23	-	ns
Q _{rr}	Reverse Recovery Charge		-	11	-	nC

Notes:

- The data tested by surface mounted on a 1 inch² FR-4 board with 20Z copper
- The data tested by surface mounted on a minimum recommended FR-4 board
- The data tested by pulsed, pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$
- The E_{AS} data shows Max. rating. The test condition is $V_{DD} = -30\text{V}$, $V_{GS} = -10\text{V}$, $L = 0.1\text{mH}$
- Guaranteed by design, not subject to production

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

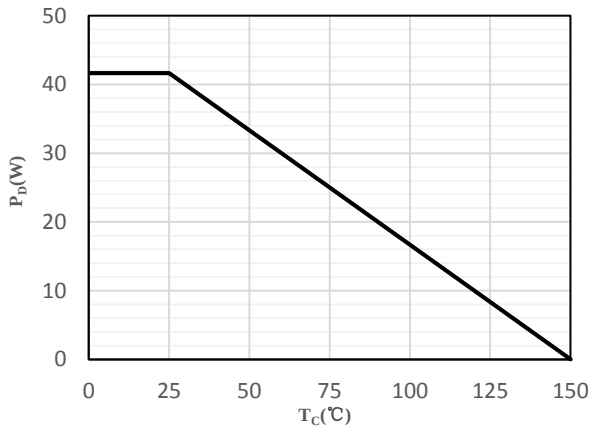


Fig 1 Power Dissipation

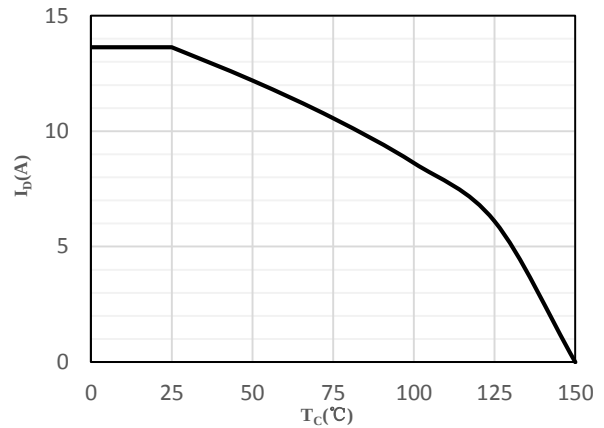


Fig 2 Drain Current

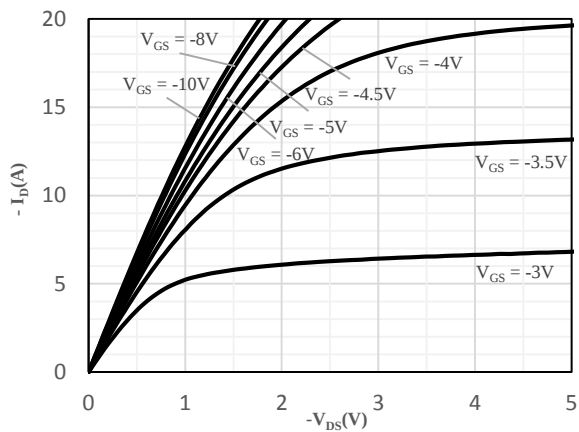


Fig 3 Typical Output Characteristics

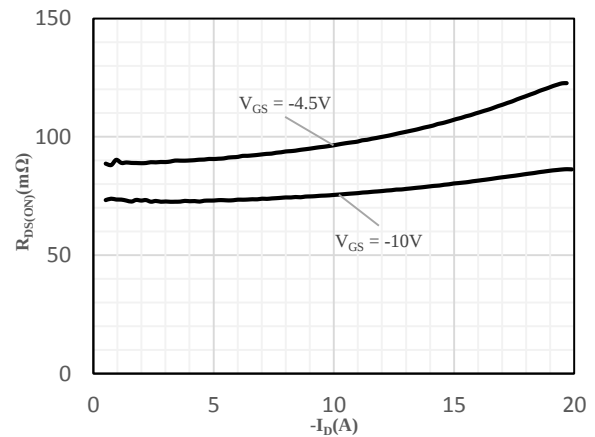


Fig 4 On-Resistance vs. Drain Current and Gate Voltage

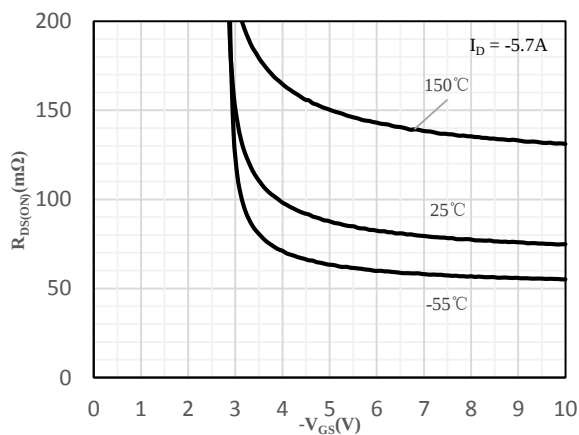


Fig 5 On-Resistance vs. Gate-Source Voltage

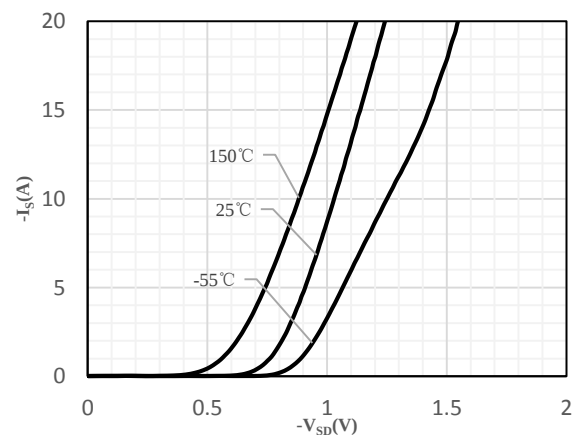


Fig 6 Body-Diode Characteristics

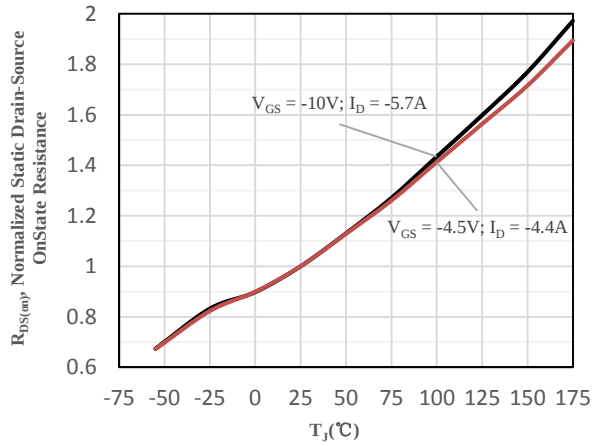


Fig 7 Normalized On-Resistance vs. Junction Temperature

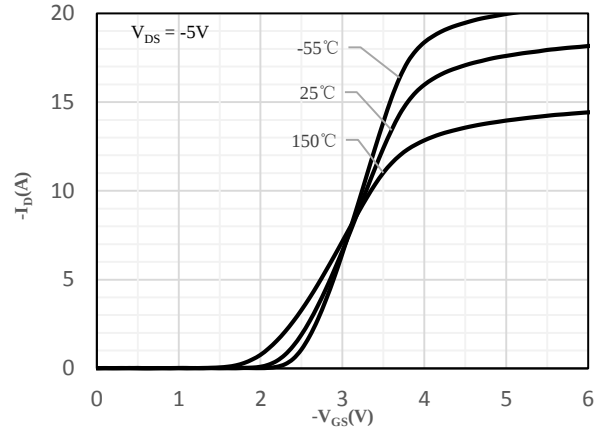


Fig 8 Transfer Characteristics

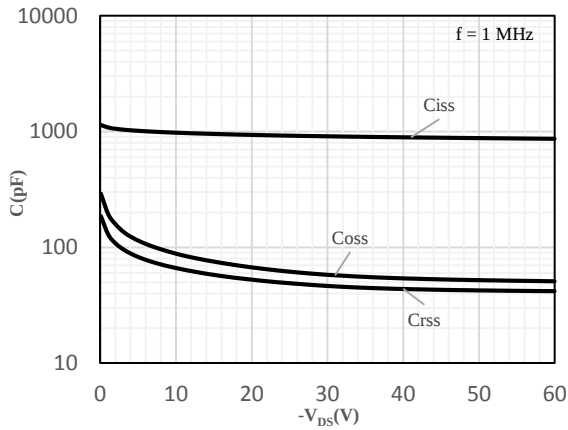


Fig 9 Capacitance Characteristics

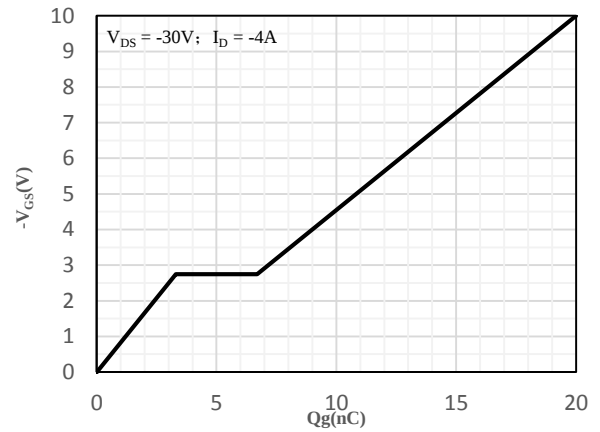


Fig 10 Gate-Charge Characteristics

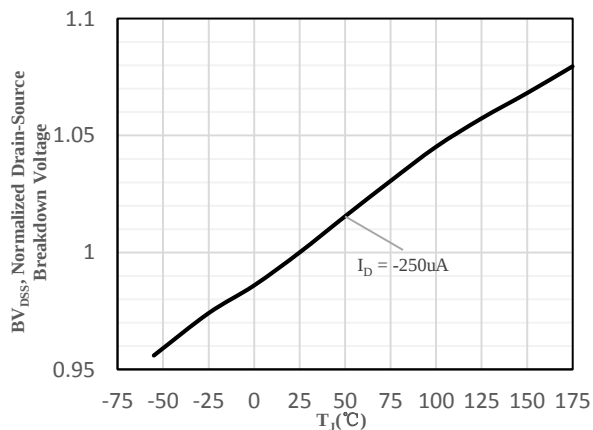


Fig 11 Normalized Breakdown Voltage vs. Junction Temperature

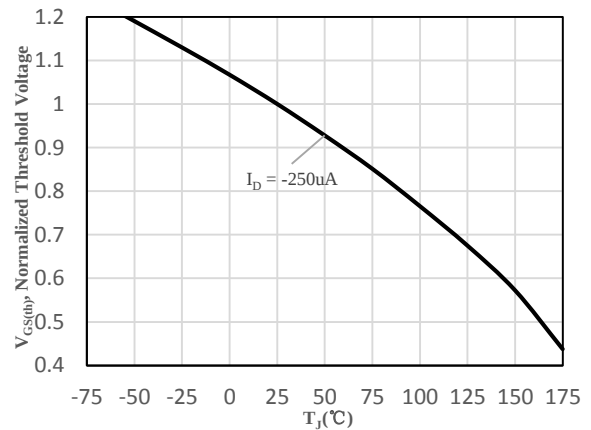


Fig 12 Normalized $V_{GS(th)}$ vs. Junction Temperature

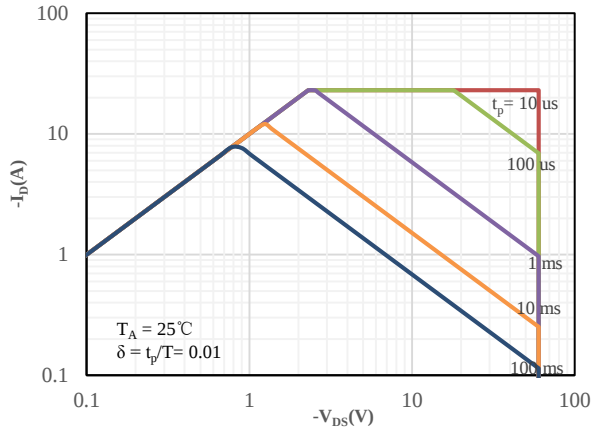


Fig 13 Safe Operation Area

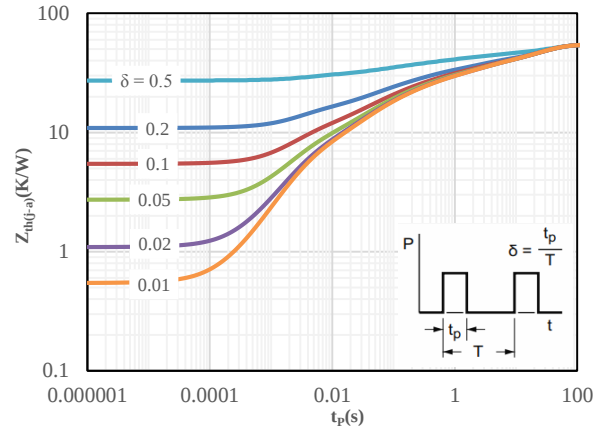
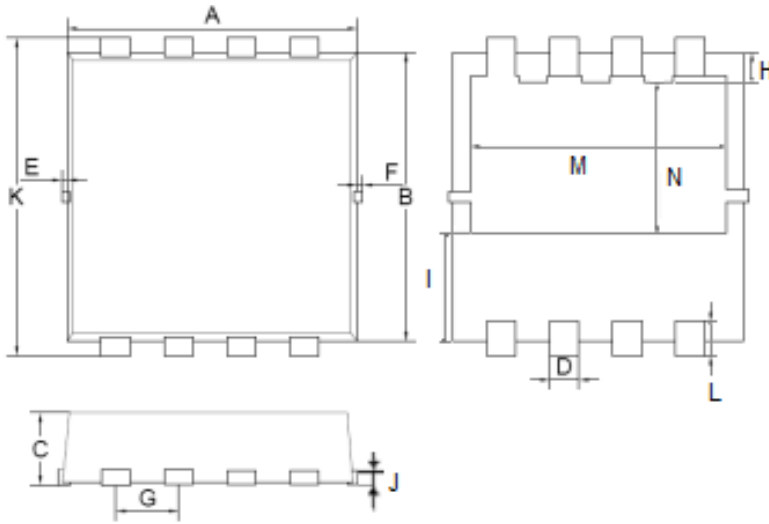


Fig 14 Maximum transient thermal impedance

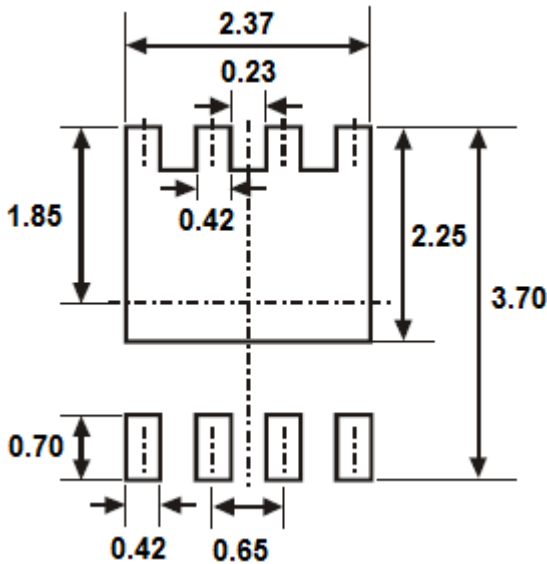
Package Outline Dimensions (Unit: mm)



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



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