

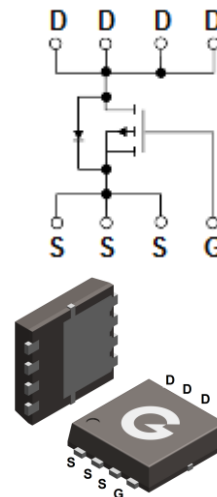
Features

- Super low gate charge
- Green device available
- Excellent C_{dv} / d_t effect decline
- Advanced high cell density trench technology
- Halogen free
- Qualified to AEC-Q101 standards for high reliability

HF

Mechanical Data

- Case: PDFN3×3-8L
- Molding Compound: UL Flammability Classification Rating 94V-0
- Terminals: Matte tin-plated leads; solderability-per MIL-STD-202, Method 208



PDFN3×3-8L

Ordering Information

Part Number	Package	Shipping Quantity	Marking Code
TBL130P04-3DL8	PDFN3×3-8L	5000 pcs / Tape & Reel	130P04

Maximum Ratings (@ $T_A = 25^\circ\text{C}$ 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 ($V_{GS}=10\text{V}$, $T_C = 25^\circ\text{C}$)	I_D	-49	A
Continuous Drain Current ($V_{GS}=10\text{V}$, $T_C = 100^\circ\text{C}$)		-31	A
Pulsed Drain Current ^{*2 *4}	I_{DM}	-268	A
Single Pulse Avalanche Energy ^{*3}	E_{AS}	125	mJ

Thermal Characteristics

Parameter	Symbol	Value	Unit
Power Dissipation ($T_C = 25^\circ\text{C}$)	P_D	50	W
Thermal Resistance Junction-to-Air ^{*1}	$R_{\theta JA}$	96	$^\circ\text{C/W}$
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	2.5	$^\circ\text{C/W}$
Operating Junction Temperature Range	T_J	-55 ~ +150	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-55 ~ +150	$^\circ\text{C}$

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	-40	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = -32V, V _{GS} = 0V, T _C = 25°C	-	-	-1	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} = ±20V, V _{DS} = 0V	-	-	±100	nA
On Characteristics						
R _{DS(ON)}	Static Drain-Source On-resistance *2	V _{GS} = -10V, I _D = -15A	-	-	13	mΩ
		V _{GS} = -4.5V, I _D = -10A	-	-	20	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = -250 μA	-1	-1.47	-2.5	V
Dynamic Characteristics						
C _{ISS}	Input Capacitance	V _{GS} = 0V V _{DS} = 25V f = 1.0MHz	-	3941	-	pF
C _{OSS}	Output Capacitance		-	262	-	
C _{RSS}	Reverse Transfer Capacitance		-	237	-	
Switching Characteristics						
t _{d(ON)}	Turn-on Delay Time	V _{DD} =-15V V _{GS} = -10V R _G = 3.3Ω, R _L = 15Ω I _D = -1A	-	40	-	ns
t _r	Turn-on Rise Time		-	35	-	
t _{d(OFF)}	Turn-Off Delay Time		-	100	-	
t _f	Turn-Off Fall Time		-	9.6	-	
Q _G	Total Gate-Charge	V _{DD} = -32V V _{GS} = -10V I _D = -50A	-	67.5	-	nC
Q _{GS}	Gate to Source Charge		-	16	-	
Q _{GD}	Gate to Drain (Miller) Charge		-	9	-	
Source-Drain Diode Characteristics						
V _{SD}	Diode Forward Voltage	I _{SD} = -1.7A, V _{GS} = 0V, T _J = 25°C	-	-	-1.2	V
I _{SD}	Diode Continuous Forward Current *1,4		-	-	-49	A

Notes:

1. Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided.
2. The data tested by pulsed, pulse width $\leq 10\mu s$, duty cycle $\leq 2\%$
3. The E_{AS} data shows Max. rating. The test condition is $V_{DD} = -25V, V_{GS} = -10V, L = 0.5mH$
4. The data is theoretically the same as I_D and I_{DM} , in real applications, should be limited by total power dissipation

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

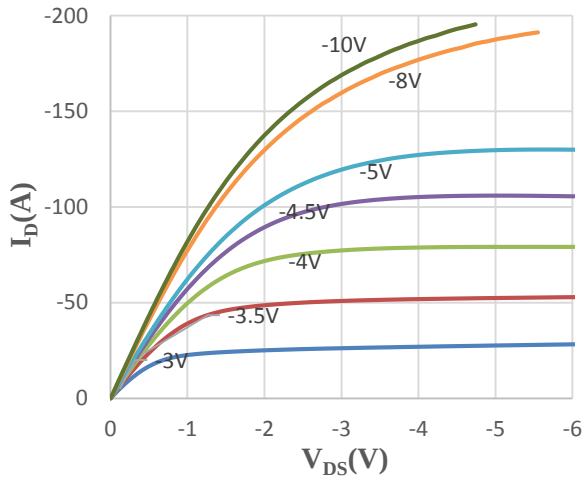


Fig 1 Typical Output Characteristics

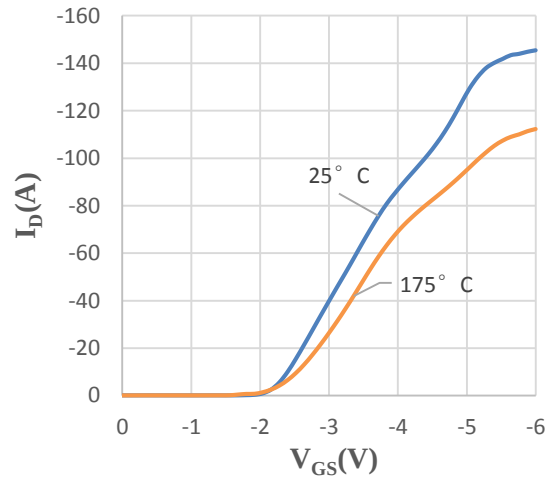


Fig 2 Transfer Characteristics

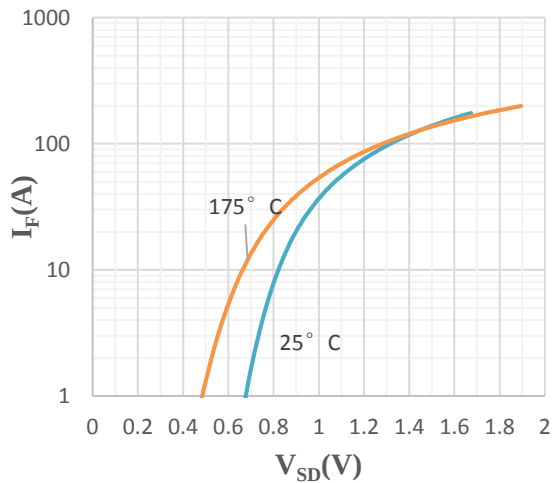


Fig 3 Body-Diode Characteristics

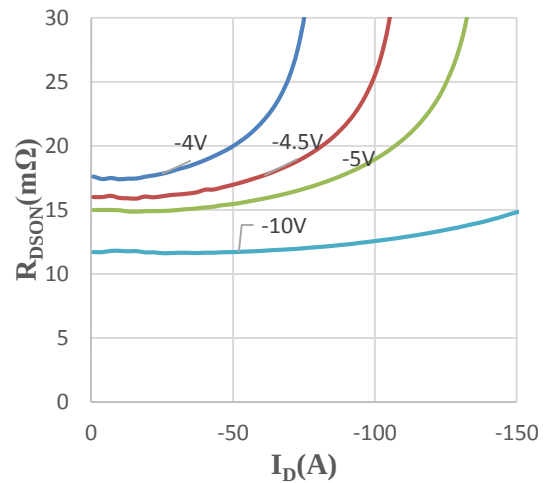


Fig 4 Drain-source on-state resistance

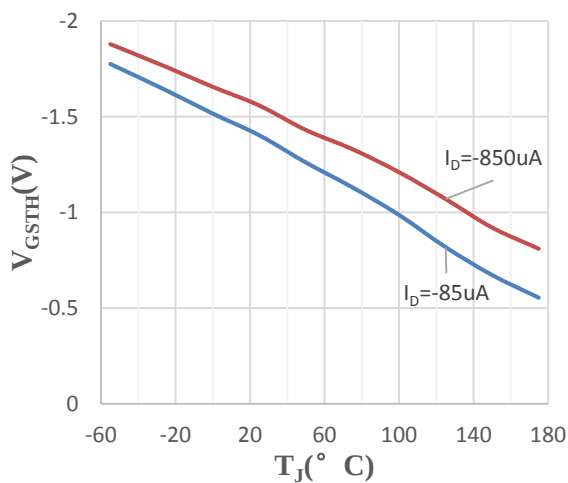


Fig 5 Gate Voltage vs. Junction Temperature

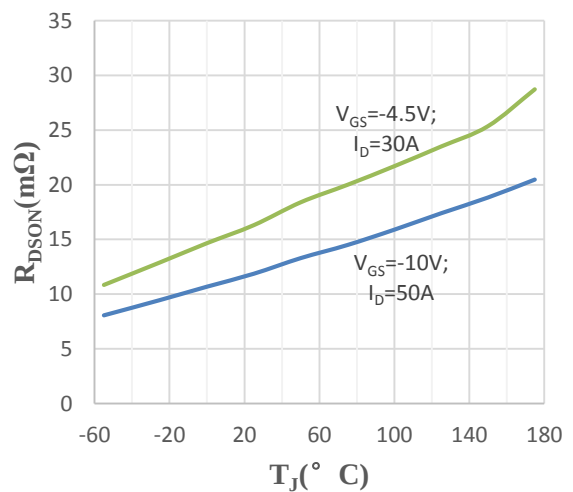


Fig 6 On-Resistance vs. Junction Temperature

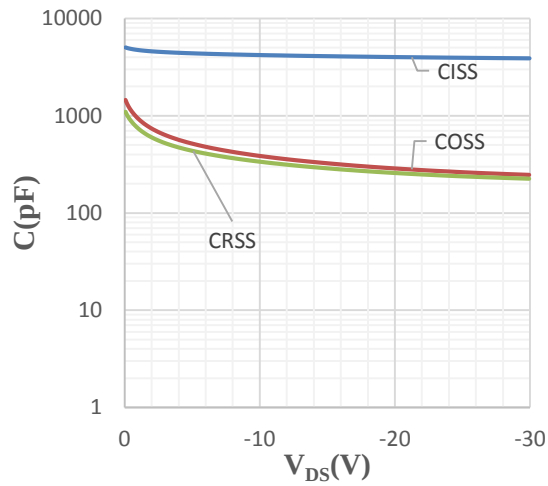


Fig 7 Capacitance Characteristics

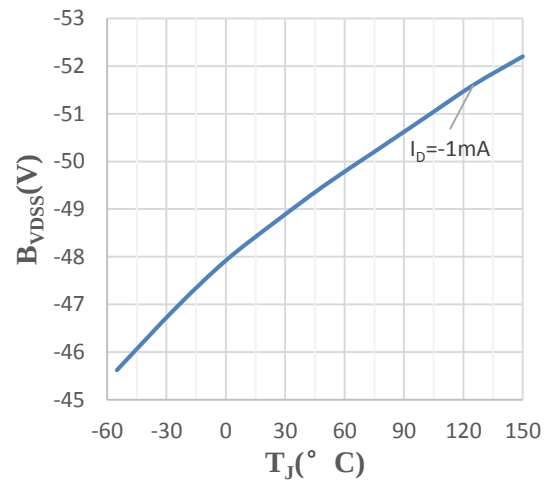


Fig 8 Drain-Source breakdown voltage

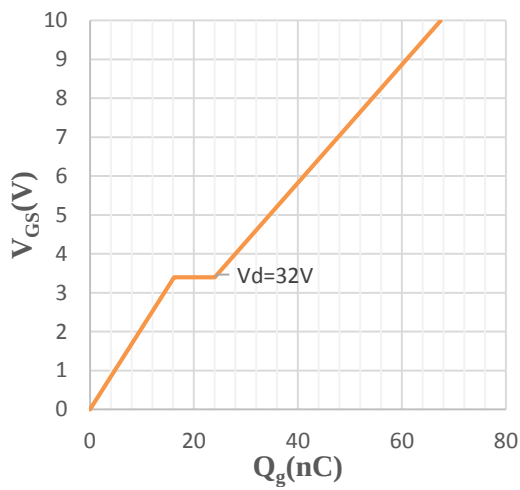


Fig 9 Gate-charge Characteristics

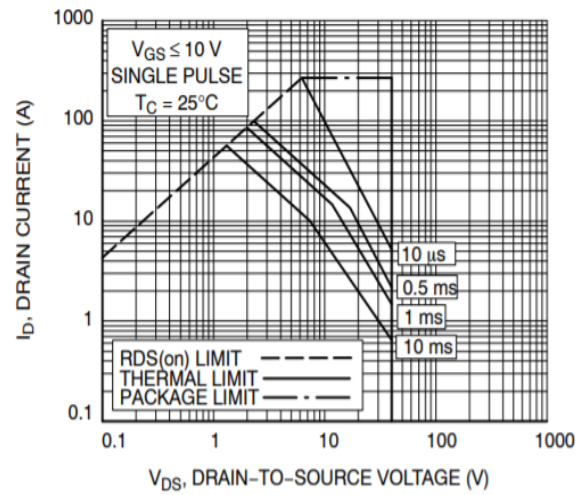
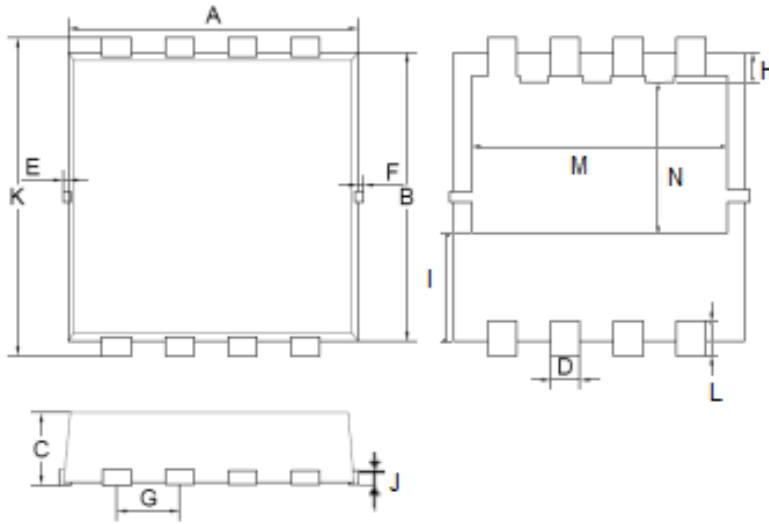


Fig 10 SOA

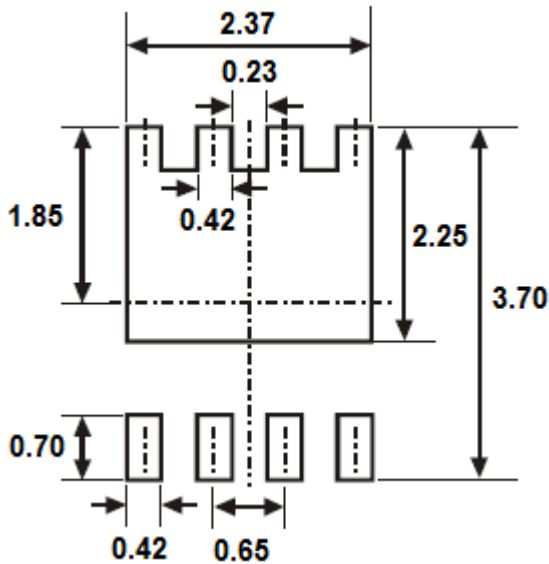
Package Outline Dimensions (Unit: mm)



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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