

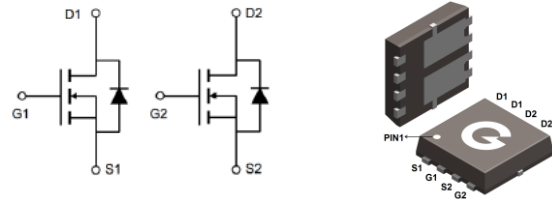
### Features

- Excellent  $R_{DS(ON)}$  and low gate charge

**HF**

### Mechanical Data

- Case: PDFN3x3-8LC
- Molding Compound: UL Flammability Classification Rating 94V-0
- Terminals: Matte tin-plated leads; solderability-per MIL-STD-202, Method 208



**PDFN3x3-8LC**

### Ordering Information

Part Number	Package	Shipping Quantity	Marking Code
GBLN4405-3DL8	PDFN3x3-8LC	5000 pcs / Tape & Reel	GBLN4405

### 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	$V_{GSS}$	$\pm 20$	V
Continuous Drain Current ( $T_C = 25^\circ\text{C}$ )	$I_D$	22	A
Continuous Drain Current ( $T_C = 100^\circ\text{C}$ )		14	A
Pulsed Drain Current ( $t_p = 10\mu\text{s}$ , $T_C = 25^\circ\text{C}$ )	$I_{DM}$	88	A
Single Pulse Avalanche Energy <sup>*3</sup>	$E_{AS}$	9	mJ
Power Dissipation ( $T_C = 25^\circ\text{C}$ )	$P_D$	23	W
Operating Junction Temperature Range	$T_J$	-55 ~ +150	$^\circ\text{C}$
Storage Temperature Range	$T_{STG}$	-55 ~ +150	$^\circ\text{C}$

### Thermal Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	-	5	5.5	$^\circ\text{C/W}$
Thermal Resistance Junction-to-Air <sup>*1</sup>	$R_{\theta JA}$	-	52	61	$^\circ\text{C/W}$

### Electrical Characteristics (@ T<sub>A</sub> = 25°C unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
<b>Static Characteristics</b>						
V <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA	40	-	-	V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> = 40V, V <sub>GS</sub> = 0V	-	-	1	μA
I <sub>GSS</sub>	Gate-Body Leakage Current	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V	-	-	±100	nA
<b>On Characteristics</b>						
R <sub>DS(ON)</sub>	Drain-Source On-resistance <sup>*2</sup>	V <sub>GS</sub> = 10V, I <sub>D</sub> = 4A	-	19	23	mΩ
		V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 3A	-	25	30	mΩ
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA	1	1.5	2.5	V
R <sub>G</sub>	Gate Resistance	V <sub>GS</sub> = 0V, f = 1MHz	-	4.5	-	Ω
<b>Dynamic Characteristics</b>						
C <sub>ISS</sub>	Input Capacitance	V <sub>GS</sub> = 0V V <sub>DS</sub> = 20V f = 1.0MHz	-	732	-	pF
C <sub>OSS</sub>	Output Capacitance		-	59	-	
C <sub>RSS</sub>	Reverse Transfer Capacitance		-	46	-	
<b>Switching Characteristics</b>						
t <sub>d(ON)</sub>	Turn-on Delay Time <sup>*4</sup>	V <sub>DD</sub> = 20V, V <sub>GS</sub> = 10V R <sub>G</sub> = 3Ω, R <sub>L</sub> = 1 Ω I <sub>D</sub> = 8A	-	11	-	ns
t <sub>r</sub>	Turn-on Rise Time <sup>*4</sup>		-	13	-	
t <sub>d(OFF)</sub>	Turn-Off Delay Time <sup>*4</sup>		-	36	-	
t <sub>f</sub>	Turn-Off Fall Time <sup>*4</sup>		-	9	-	
Q <sub>G</sub>	Total Gate-Charge	V <sub>DD</sub> = 20V V <sub>GS</sub> = 10V I <sub>D</sub> = 5A	-	16.7	-	nC
Q <sub>GS</sub>	Gate to Source Charge		-	2.6	-	
Q <sub>GD</sub>	Gate to Drain (Miller) Charge		-	2.5	-	
<b>Source-Drain Diode Characteristics</b>						
V <sub>SD</sub>	Diode Forward Voltage <sup>*2</sup>	I <sub>SD</sub> = 8A, V <sub>GS</sub> = 0V	-	0.88	1.2	V
t <sub>rr</sub>	Reverse Recovery Time	I <sub>F</sub> = 8A, V <sub>GS</sub> = 0V di/dt = 100A/μs	-	17	-	ns
Q <sub>rr</sub>	Reverse Recovery Charge		-	6.2	-	nC

Notes:

1. The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 2OZ copper
2. The data tested by pulsed, pulse width ≤ 300μs, duty cycle ≤ 2%
3. The E<sub>AS</sub> data shows Max. rating. The test condition is V<sub>DD</sub> = 20V, V<sub>GS</sub> = 10V, L = 0.5mH
4. Guaranteed by design, not subject to production

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

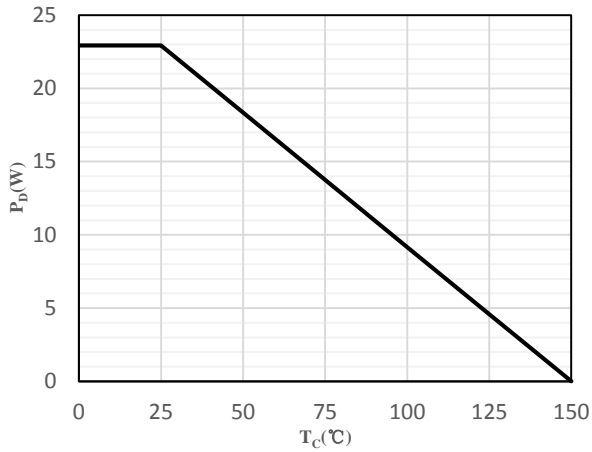


Fig 1 Power Dissipation

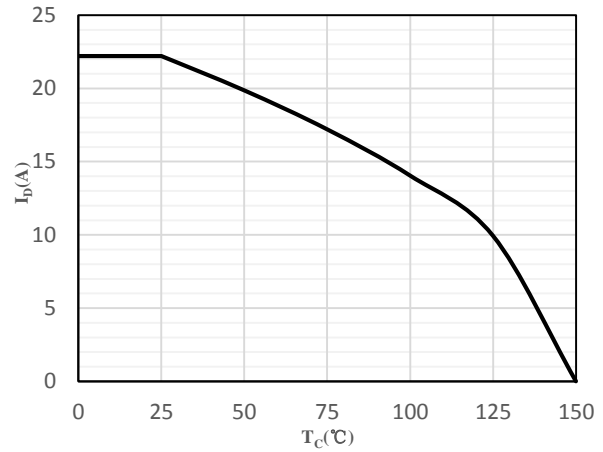


Fig 2 Drain Current

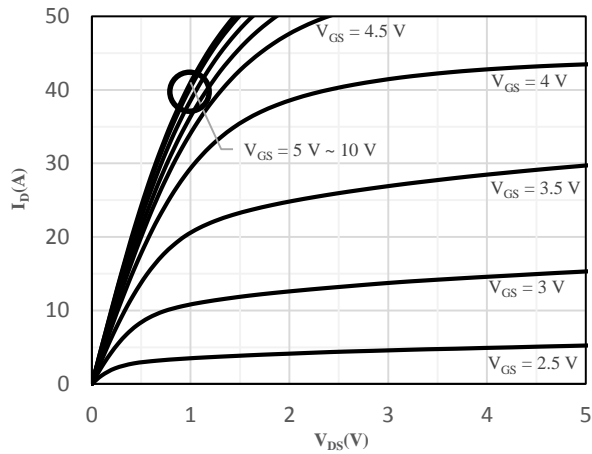


Fig 3 Typical Output Characteristics

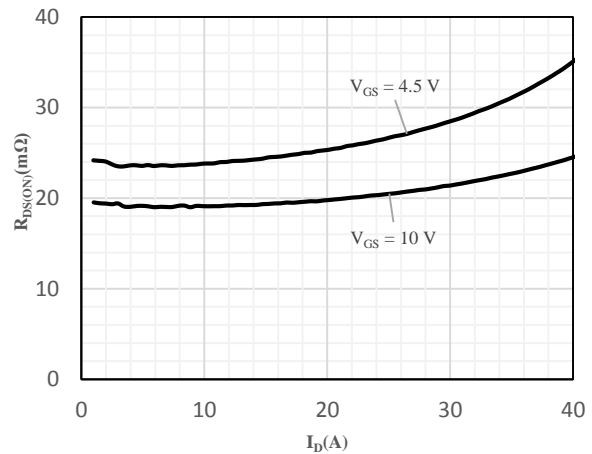


Fig 4 On-Resistance vs. Drain Current and Gate Voltage

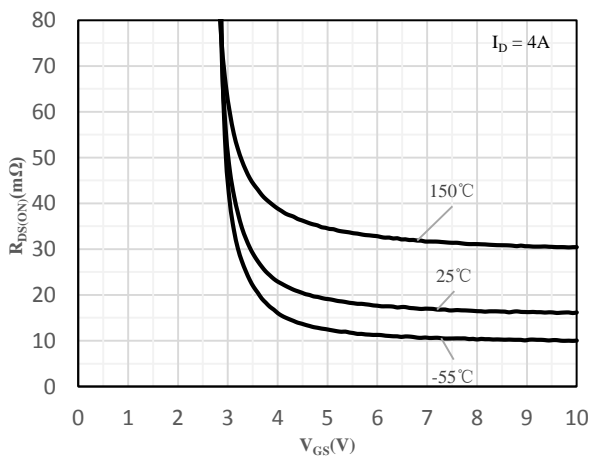


Fig 5 On-Resistance vs. Gate-Source Voltage

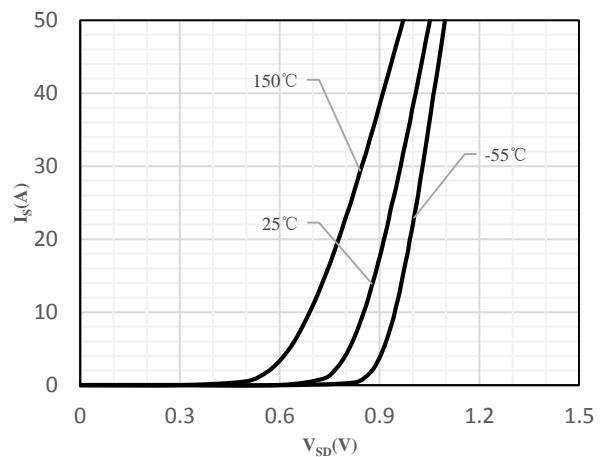


Fig 6 Body-Diode Characteristics

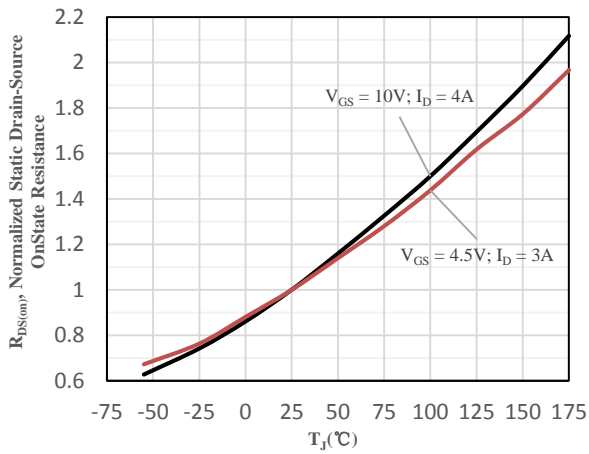


Fig 7 Normalized On-Resistance vs. Junction Temperature

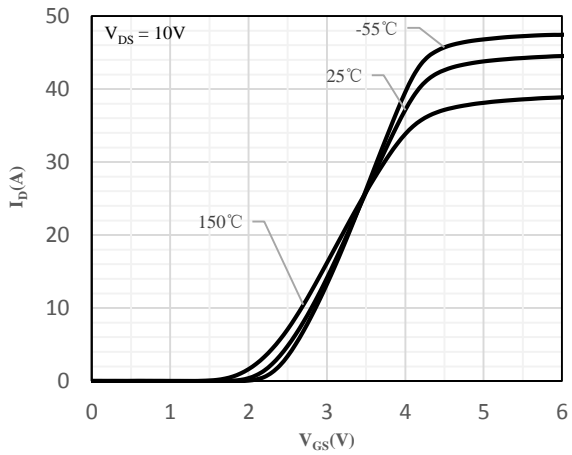


Fig 8 Transfer Characteristics

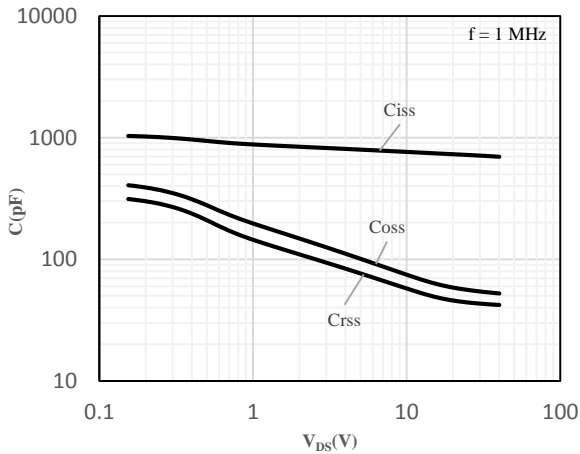


Fig 9 Capacitance Characteristics

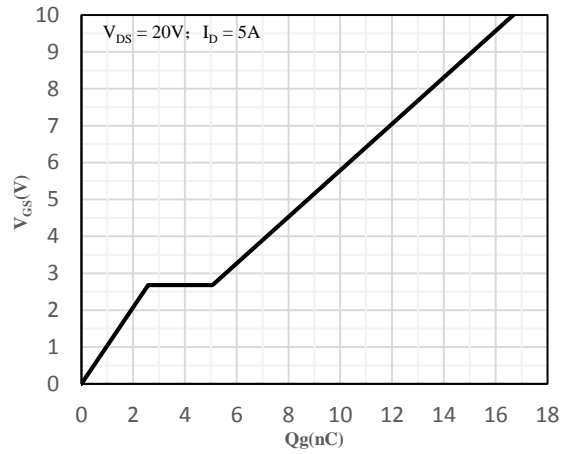


Fig 10 Gate-Charge Characteristics

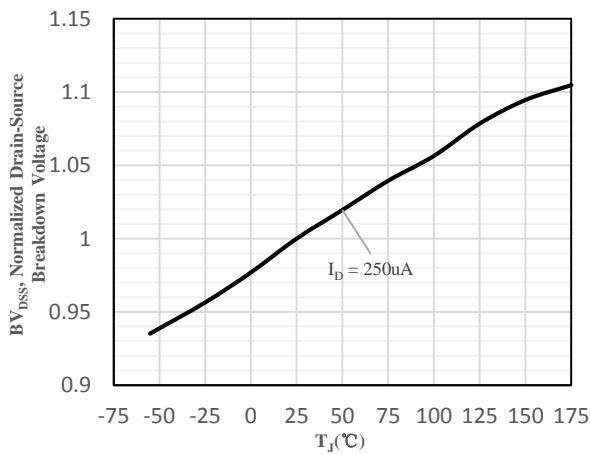


Fig 11 Normalized Breakdown Voltage vs. Junction Temperature

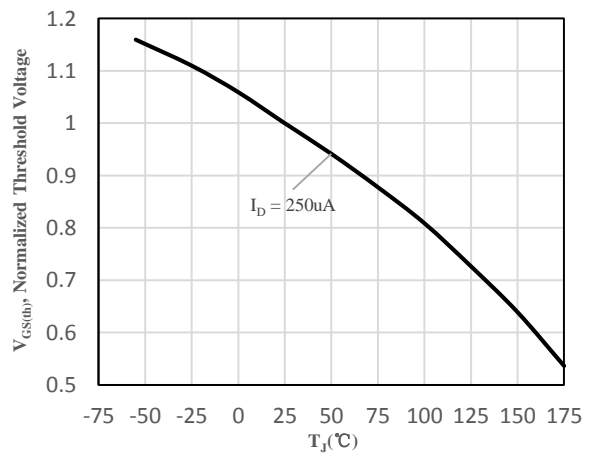


Fig 12 Normalized  $V_{GS(th)}$  vs. Junction Temperature

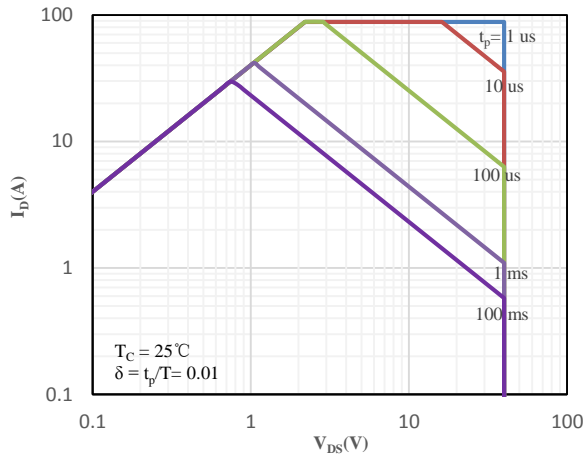


Fig 13 Safe Operation Area

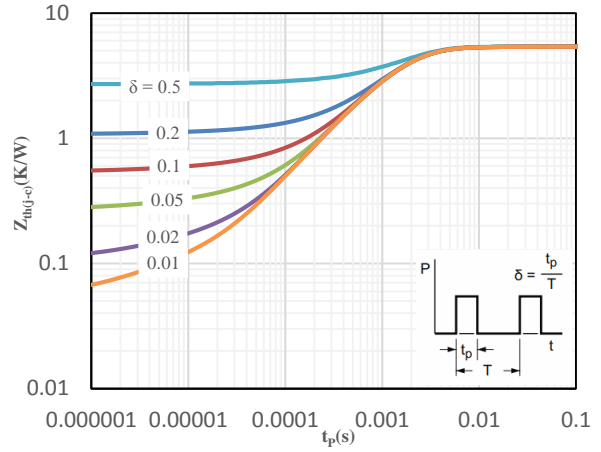
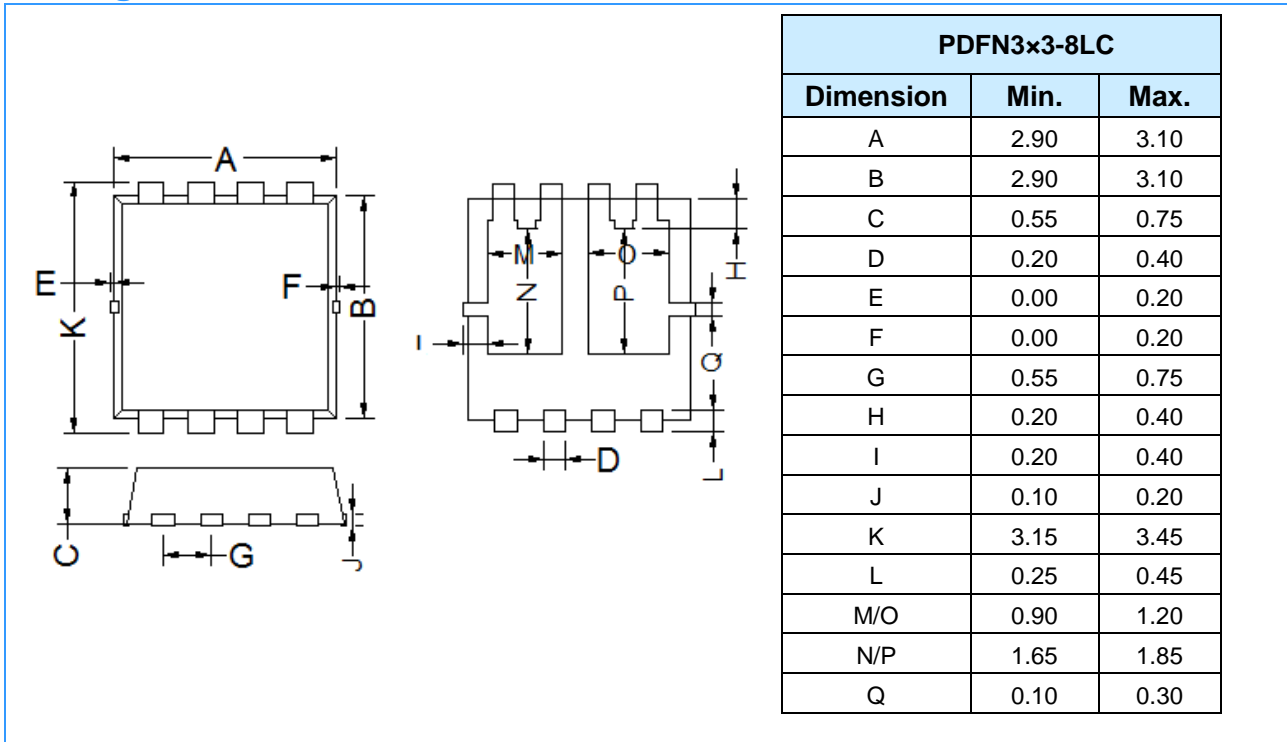
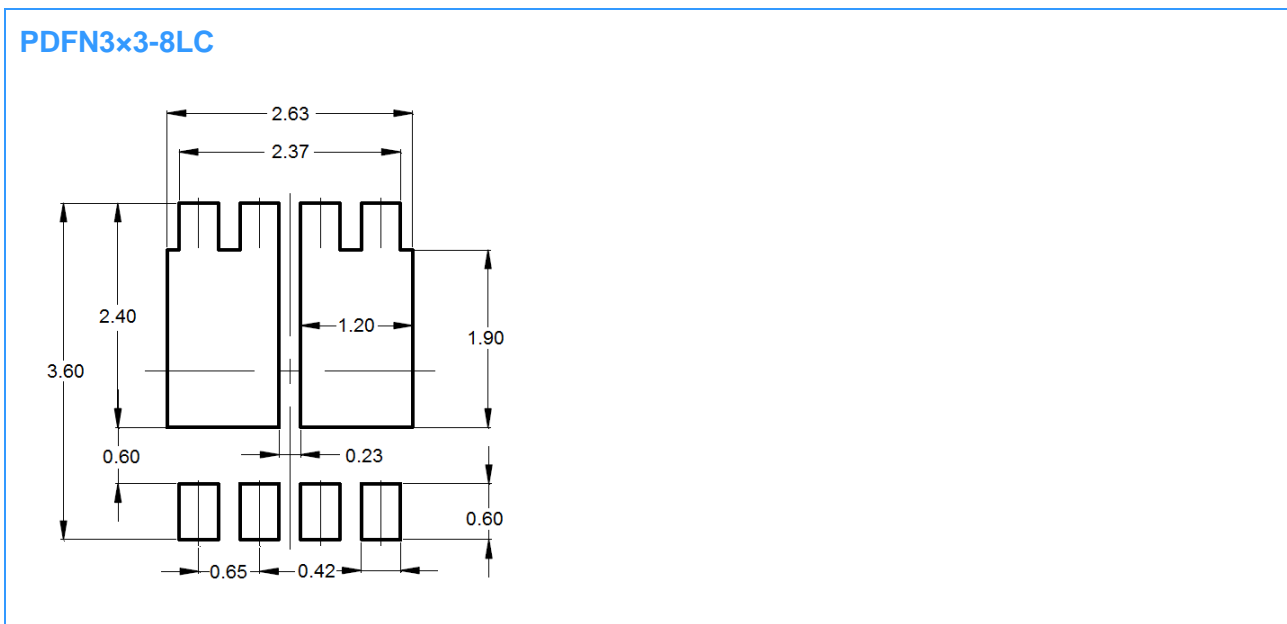


Fig 14 Maximum transient thermal impedance

### Package Outline Dimensions (Unit: mm)



### Mounting Pad Layout (Unit: mm)



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