

100V N-Channel Enhancement Mode MOSFET

Voltage 100 V **R_{DS(ON)}** 9.4 mΩ

Current 61 A **Q_G (TYP)** 19 nC

Feature

- $R_{DS(ON)} < 9.4 \text{ m}\Omega$ at $V_{GS} = 10 \text{ V}$, $I_D = 30 \text{ A}$
- $R_{DS(ON)} < 15.6 \text{ m}\Omega$ at $V_{GS} = 6 \text{ V}$, $I_D = 15 \text{ A}$
- High switching speed
- Low reverse transfer capacitance
- Lead free in compliance with EU RoHS 2.0
- Green molding compound as per IEC 61249 standard
- 100% UIS / Rg test in mass production

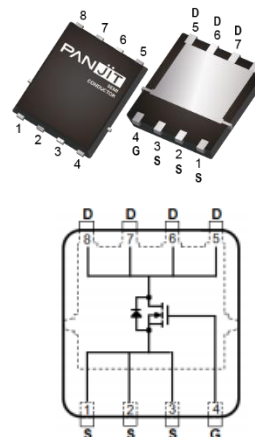
Mechanical Data

- Case : DFN5060-8L Package
- Terminals : Solderable per MIL-STD-750, Method 2026
- Approx. Weight : 0.08 grams

Application

- PD Charger / Adapter / Home Appliance.

DFN5060-8L



Top side view

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

PARAMETER		SYMBOL	LIMIT	UNITS
Drain-Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	± 20	
Continuous Drain Current (Note 3)	$T_C = 25^\circ\text{C}$	I_D	61	A
	$T_C = 100^\circ\text{C}$		43	
Pulsed Drain Current	$T_C = 25^\circ\text{C}$	I_{DM}	244	A
Single Pulse Avalanche Current (Note 5)		I_{AS}	28	A
Single Pulse Avalanche Energy (Note 5)		E_{AS}	98	mJ
Power Dissipation	$T_C = 25^\circ\text{C}$	P_D	75	W
	$T_C = 100^\circ\text{C}$		37.5	
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-55~175	$^\circ\text{C}$

Thermal Characteristics

PARAMETER		SYMBOL	VALUES			UNITS
			MIN.	TYP.	MAX.	
Thermal Resistance	Junction-to-Case (Bottom)	$R_{\theta JC}$	-	1.3	2.0	$^\circ\text{C/W}$
	Junction-to-Ambient (Note 4)	$R_{\theta JA}$	-	-	50	$^\circ\text{C/W}$

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

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNITS
Static Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0\text{ V}, I_D=250\text{ }\mu\text{A}$	100	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=115\text{ }\mu\text{A}$	1.8	2.8	3.8	
Drain-Source On-State Resistance (Note 1)	$R_{DS(on)}$	$V_{GS}=10\text{ V}, I_D=30\text{ A}$	-	8.4	9.4	m Ω
		$V_{GS}=6\text{ V}, I_D=15\text{ A}$	-	11.0	15.6	
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=100\text{ V}, V_{GS}=0\text{ V}$	-	-	1	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20\text{ V}, V_{DS}=0\text{ V}$	-	-	± 100	nA
Transfer Characteristics (Note 1)	g_{fs}	$V_{DS}=10\text{ V}, I_D=30\text{ A}$	-	45	-	S
Dynamic Characteristics (Note 6)						
Total Gate Charge	Q_g	$V_{DS}=50\text{ V}, I_D=30\text{ A}, V_{GS}=10\text{ V}$	-	19	25	nC
Gate-Source Charge	Q_{gs}		-	7.6	-	
Gate-Drain Charge	Q_{gd}		-	3.0	-	
Gate Plateau Voltage	$V_{plateau}$		-	5.4	-	V
Input Capacitance	C_{iss}	$V_{DS}=50\text{ V}, V_{GS}=0\text{ V}, f=250\text{ kHz}$	-	1370	1780	pF
Output Capacitance	C_{oss}		-	460	600	
Reverse Transfer Capacitance	C_{rss}		-	10	-	
Output Charge	Q_{oss}	$V_{DS}=50\text{ V}, V_{GS}=0\text{ V}$	-	34	44	nC
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=50\text{ V}, I_D=30\text{ A}, V_{GS}=10\text{ V},$ $R_G=3.0\text{ }\Omega$ (Note 2)	-	6.2	-	ns
Rise Time	t_r		-	3.3	-	
Turn-Off Delay Time	$t_{d(off)}$		-	10.4	-	
Fall Time	t_f		-	3.3	-	
Gate Resistance	R_g	$f=1.0\text{ MHz}$	-	1.1	2.2	Ω
Drain-Source Diode						
Diode Forward Voltage	V_{SD}	$I_S=30\text{ A}, V_{GS}=0\text{ V}$	-	0.9	1.2	V
Reverse Recovery Charge	Q_{rr}	$I_F=30\text{ A}, V_{DD}=50\text{ V},$ $di/dt=100\text{ A}/\mu\text{s}$	-	45	-	nC
Reverse Recovery Time	T_{rr}		-	41	-	ns

NOTES :

1. Pulse width $\leq 300\text{ }\mu\text{s}$, Duty cycle $\leq 2\%$.
2. Essentially independent of operating temperature typical characteristics.
3. The maximum drain current calculated by maximum junction temperature and thermal impedance. It can be varied by application and environment.
4. $R_{\theta JA}$ is the sum of the junction-to-case and case-to-ambient thermal resistance where the case thermal reference is defined as the solder mounting surface of the drain pins. Mounted on a 1 inch² with 2oz.square pad of copper.
5. E_{AS} is calculated based on the condition of $L = 1.0\text{ mH}$, $I_{AS} = 14\text{ A}$, $V_{DD} = 50\text{ V}$, $V_{GS} = 10\text{ V}$. 100% test at $L = 0.1\text{ mH}$, $I_{AS} = 28\text{ A}$ in production.
6. Guaranteed by design, not subject to production testing.

TYPICAL CHARACTERISTIC CURVES

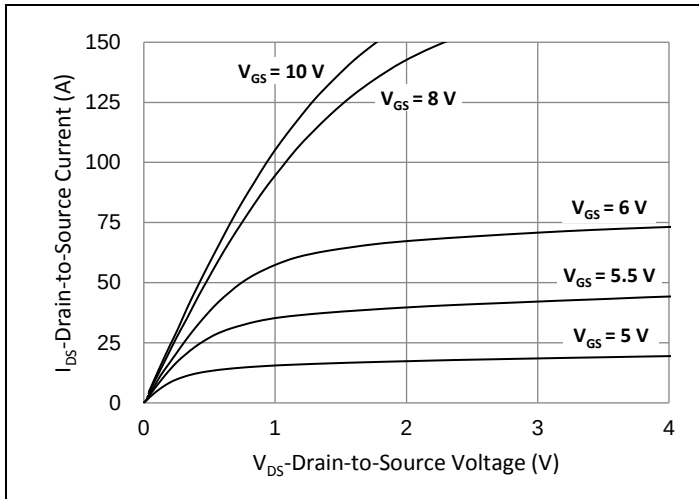


Fig.1 Output Characteristics

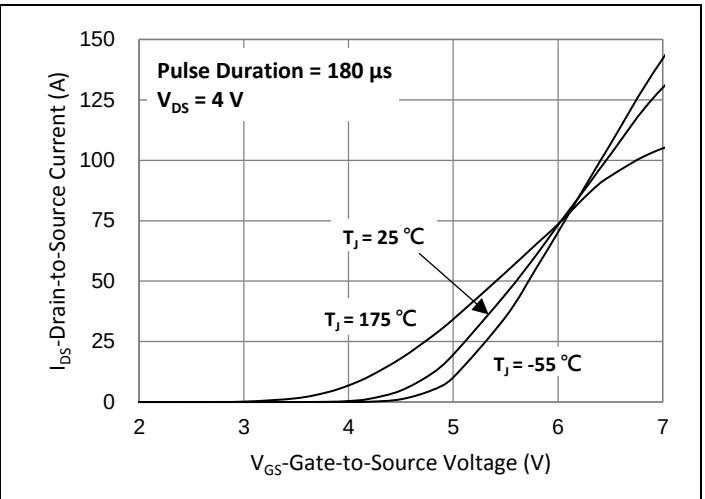


Fig.2 Transfer Characteristics

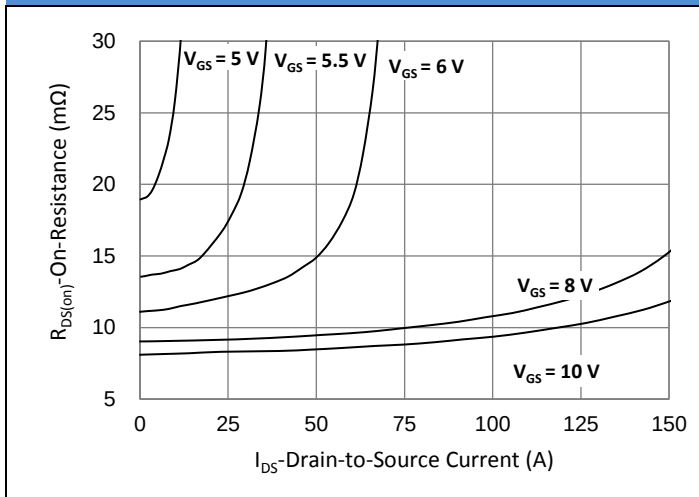


Fig.3 On-Resistance vs. Drain Current

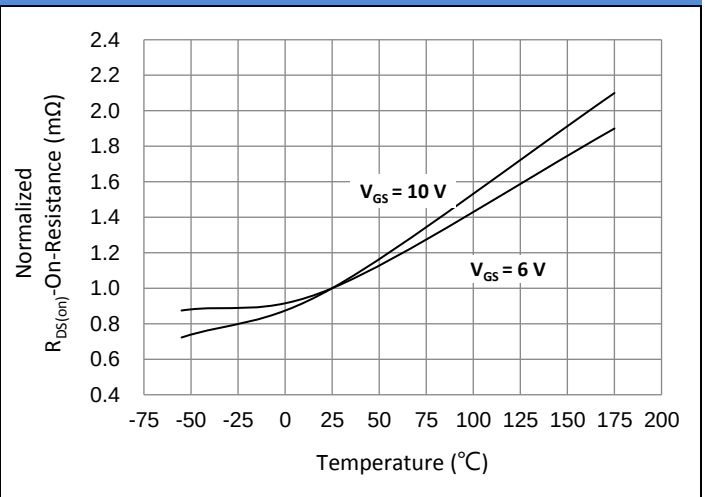


Fig.4 On-Resistance vs. Junction temperature

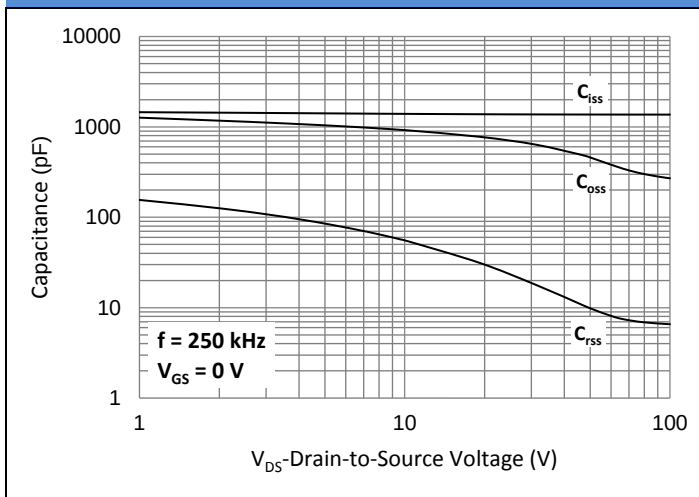


Fig.5 Capacitance vs. Drain-Source Voltage

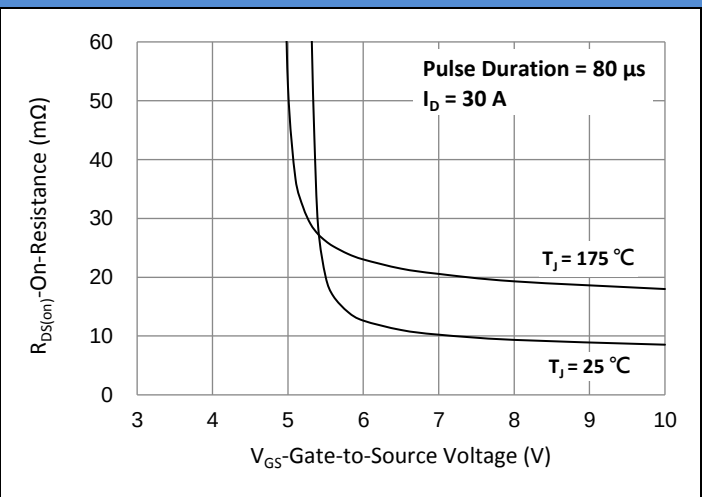


Fig.6 On-Resistance vs. Gate-Source Voltage

TYPICAL CHARACTERISTIC CURVES

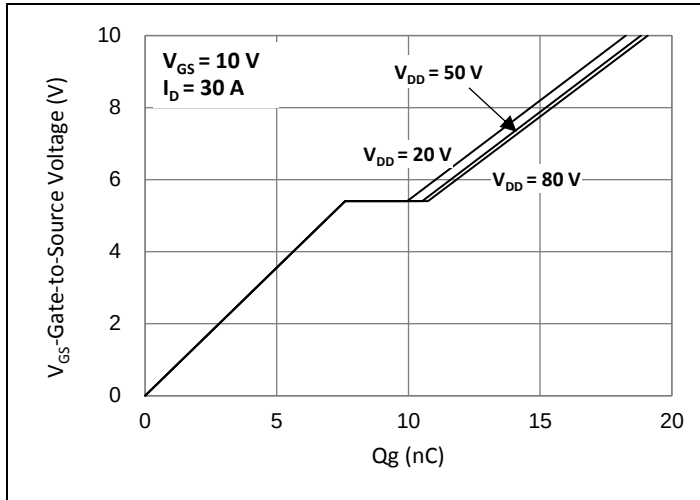


Fig.7 Gate-Charge Characteristics

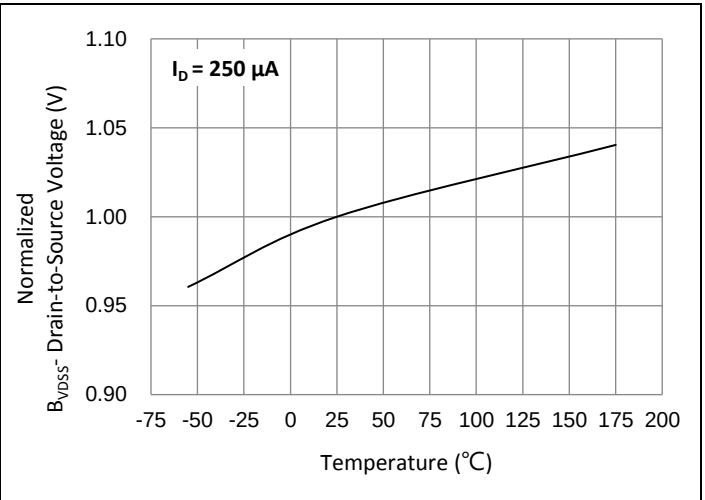


Fig.8 Breakdown Voltage Variation vs. Temperature

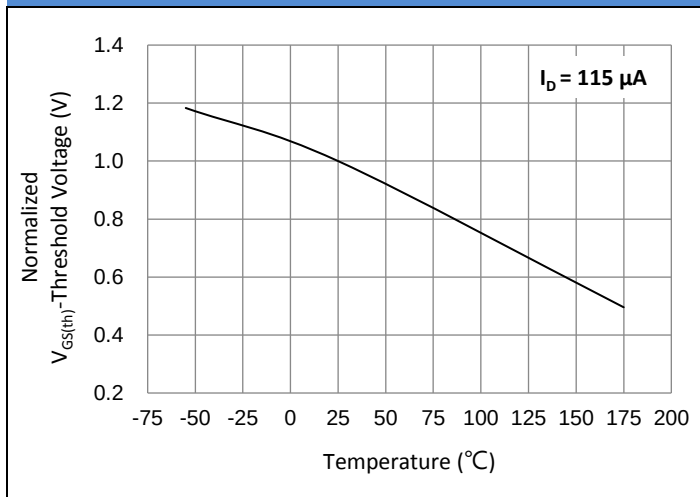


Fig.9 Threshold Voltage Variation with Temperature

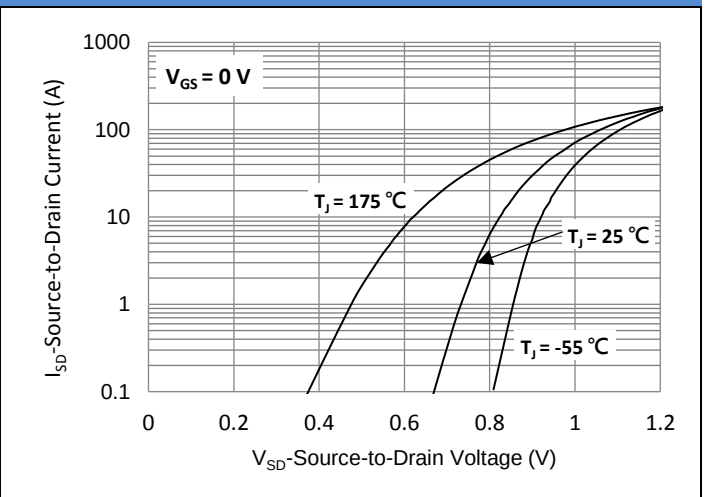


Fig.10 Source-Drain Diode Forward Voltage

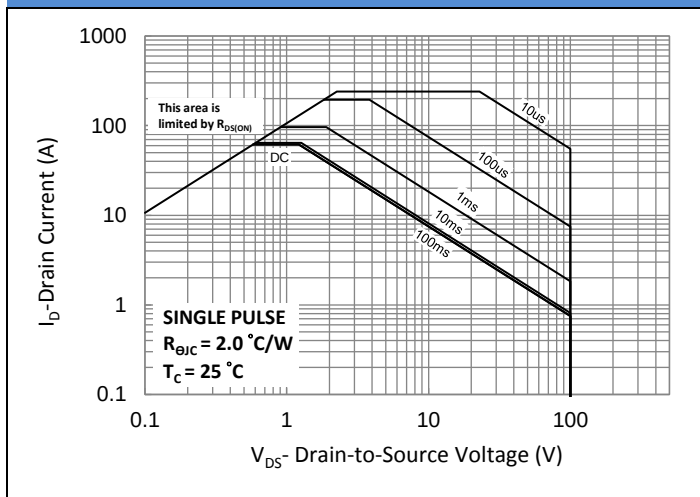


Fig.11 Maximum Safe Operating Area

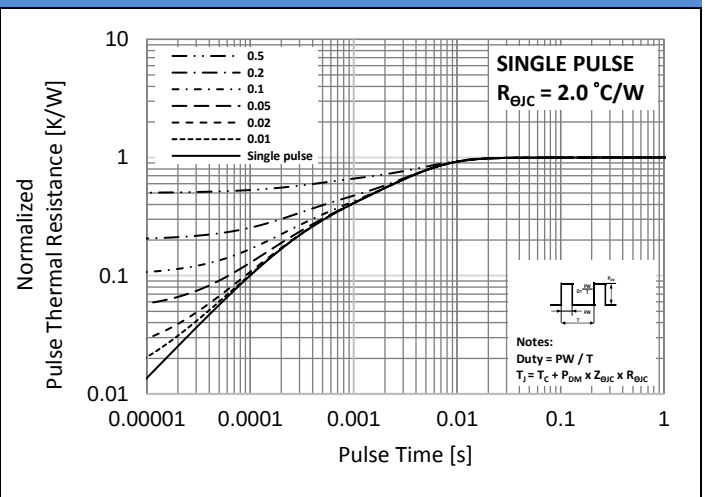
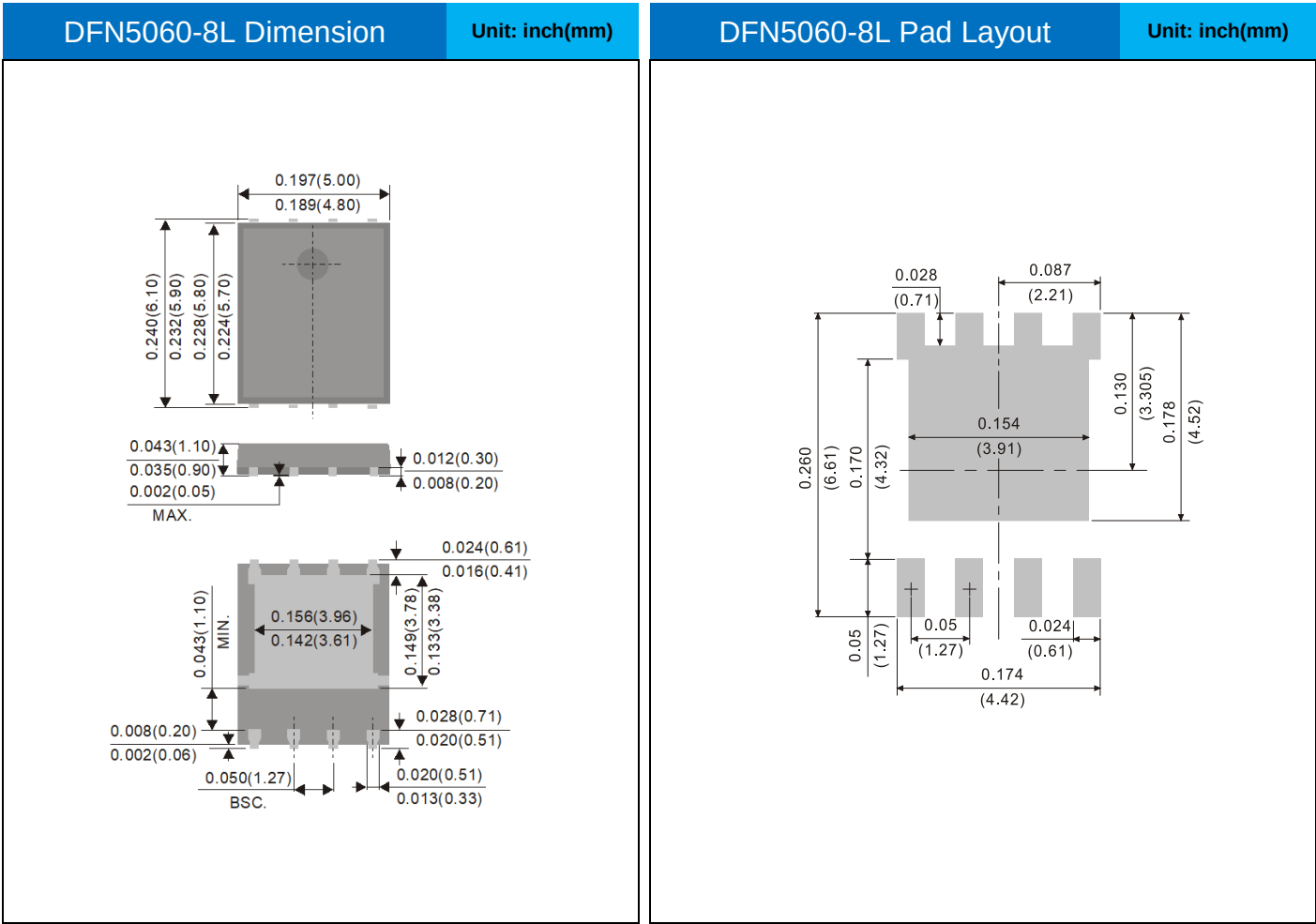


Fig.12 Normalized Transient Thermal Impedance

Product and Packing Information

Part No.	Package Type	Packing Type	Marking
PSMQC094N10NS2	DFN5060-8L	3000pcs / 13" reel	094N10NS

Packaging Information & Mounting Pad Layout



Marking Diagram

PJ	Y = Year Code
094N10NS	W = Week Code (A~Z)
YWLL x	LL = Lot Code (00~99)
	x = Production Line Code

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