

100V N-Channel Enhancement Mode MOSFET

Voltage	100 V	R_{DS(ON)}	14.4 mΩ
Current	38 A	Q_G (TYP)	16.7 nC

Feature

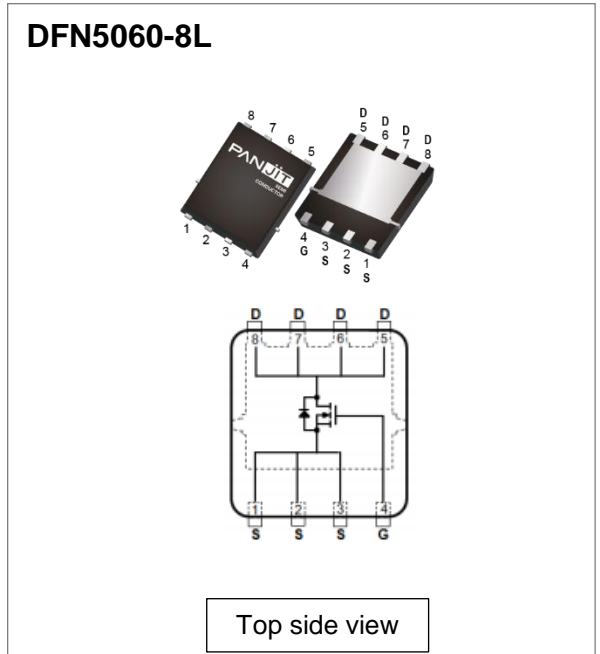
- R_{DS(ON)} < 14.4 mΩ at V_{GS} = 10 V, I_D = 20 A
- R_{DS(ON)} < 22 mΩ at V_{GS} = 4.5 V, I_D = 10 A
- High switching speed
- Low reverse transfer capacitance
- Lead free in compliance with EU RoHS 2.0
- Green molding compound as per IEC 61249 standard
- 100% UIS / Rg test in mass production

Mechanical Data

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

Application

- LED Lighting / Home Appliance



Absolute Maximum Ratings (T_A = 25 °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 °C	I _D	38	A	
	T _C =100 °C		27		
Pulsed Drain Current		T _C =25 °C	I _{DM}	152	A
Single Pulse Avalanche Current (Note 5)		I _{AS}	13	A	
Single Pulse Avalanche Energy (Note 5)		E _{AS}	24.5	mJ	
Power Dissipation	T _C =25 °C	P _D	50	W	
	T _C =100 °C		25		
Operating Junction and Storage Temperature Range		T _J , T _{STG}	-55~175	°C	

Thermal Characteristics

PARAMETER	SYMBOL	VALUES			UNITS	
		MIN.	TYP.	MAX.		
Thermal Resistance	Junction-to-Case (Bottom)	R _{θJC}	-	2.0	3.0	°C/W
	Junction-to-Ambient (Note 4)	R _{θJA}	-	-	50	°C/W

Electrical Characteristics ($T_A = 25\text{ }^\circ\text{C}$ 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	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=80\text{ }\mu\text{A}$	1.1	1.7	2.3	
Drain-Source On-State Resistance (Note 1)	$R_{DS(on)}$	$V_{GS}=10\text{ V}, I_D=20\text{ A}$	-	12.5	14.4	m Ω
		$V_{GS}=4.5\text{ V}, I_D=10\text{ A}$	-	15.5	22	
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}	$V_{DS}=10\text{ V}, I_D=20\text{ A}$	-	40	-	S
Dynamic Characteristics (Note 6)						
Total Gate Charge	Q_g	$V_{DS}=50\text{ V}, I_D=20\text{ A}, V_{GS}=4.5\text{ V}$	-	8.7	-	nC
			-	16.7	21.7	
Gate-Source Charge	Q_{gs}	$V_{DS}=50\text{ V}, I_D=20\text{ A}, V_{GS}=10\text{ V}$	-	3.9	-	nC
Gate-Drain Charge	Q_{gd}		-	2.4	-	
Gate Plateau Voltage	$V_{plateau}$		-	3.0	-	
Input Capacitance	C_{iss}	$V_{DS}=50\text{ V}, V_{GS}=0\text{ V}, f=250\text{ kHz}$	-	1150	1500	pF
Output Capacitance	C_{oss}		-	370	480	
Reverse Transfer Capacitance	C_{riss}		-	8.5	-	
Output Charge	Q_{oss}	$V_{DS}=50\text{ V}, V_{GS}=0\text{ V}$	-	27	35	nC
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=50\text{ V}, I_D=20\text{ A}, V_{GS}=10\text{ V}, R_G=3.0\text{ }\Omega$ (Note 2)	-	5.4	-	ns
Rise Time	t_r		-	2.1	-	
Turn-Off Delay Time	$t_{d(off)}$		-	13.1	-	
Fall Time	t_f		-	2.3	-	
Gate Resistance	R_g	$f=1.0\text{ MHz}$	-	0.9	1.8	Ω
Drain-Source Diode						
Diode Forward Voltage	V_{SD}	$I_S=20\text{ A}, V_{GS}=0\text{ V}$	-	0.9	1.2	V
Reverse Recovery Charge	Q_{rr}	$I_F=20\text{ A}, V_{DD}=50\text{ V}, di/dt=100\text{ A}/\mu\text{s}$	-	75	-	nC
Reverse Recovery Time	T_{rr}		-	52	-	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 $L = 1.0\text{ mH}$, $I_{AS} = 7\text{ A}$, $V_{DD} = 50\text{ V}$, $V_{GS} = 10\text{ V}$. 100% test at $L = 0.1\text{ mH}$, $I_{AS} = 13\text{ A}$, $V_{DD} = 50\text{ V}$, $V_{GS} = 10\text{ V}$ in production.
6. Guaranteed by design, not subject to production testing.

TYPICAL CHARACTERISTIC CURVES

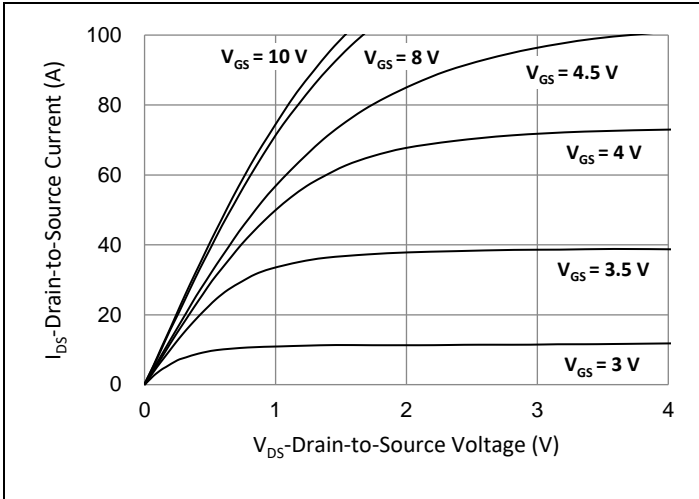


Fig.1 Output Characteristics

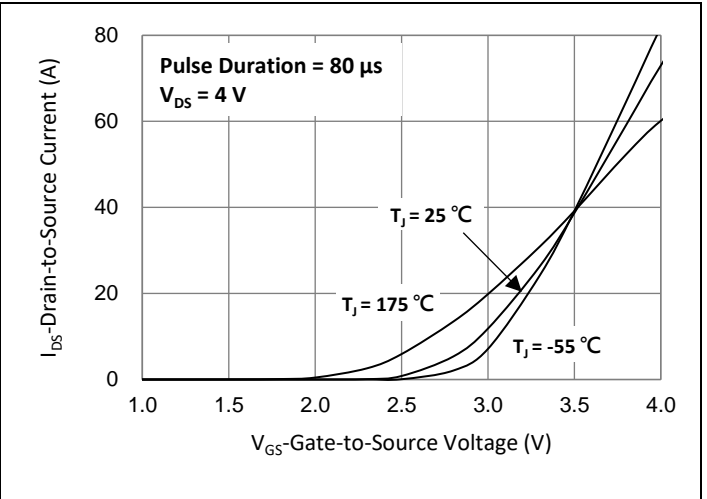


Fig.2 Transfer Characteristics

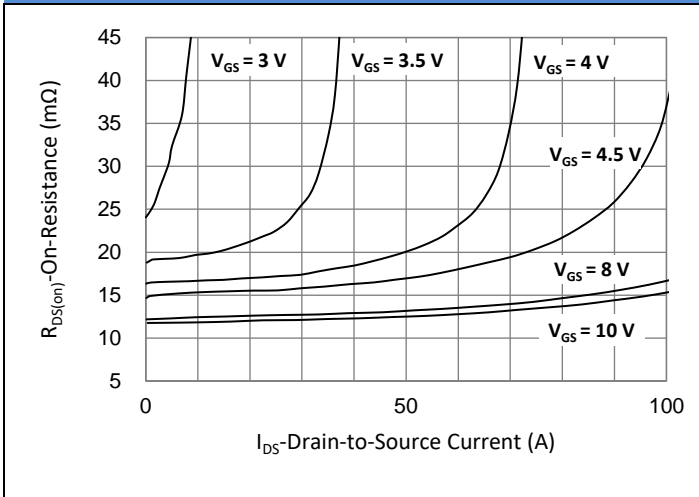


Fig.3 On-Resistance vs. Drain Current

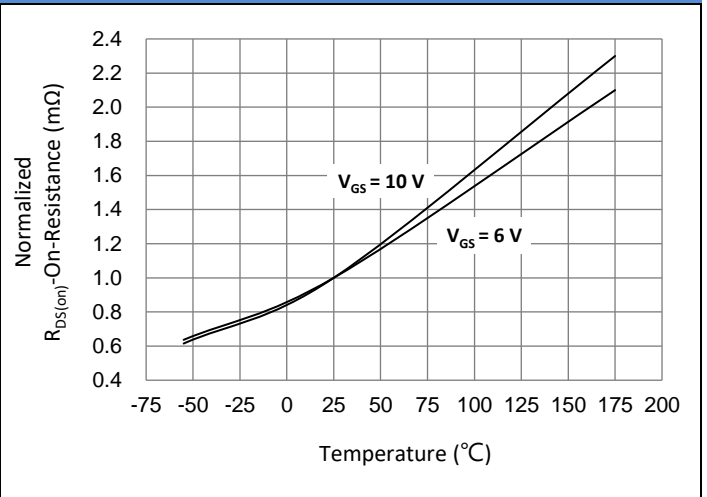


Fig.4 On-Resistance vs. Junction temperature

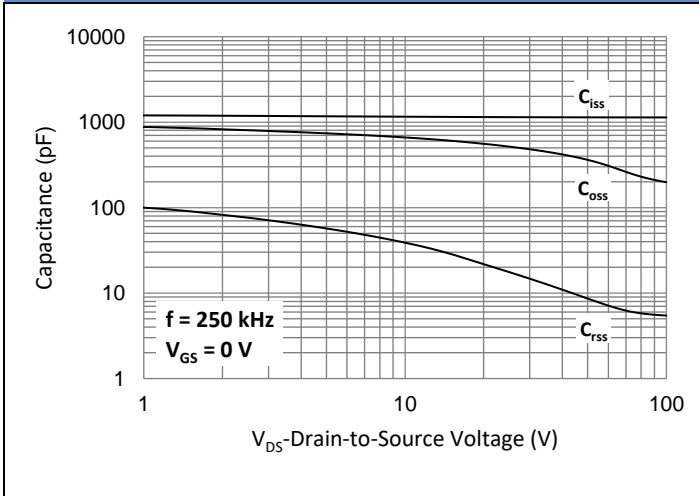


Fig.5 Capacitance vs. Drain-Source Voltage

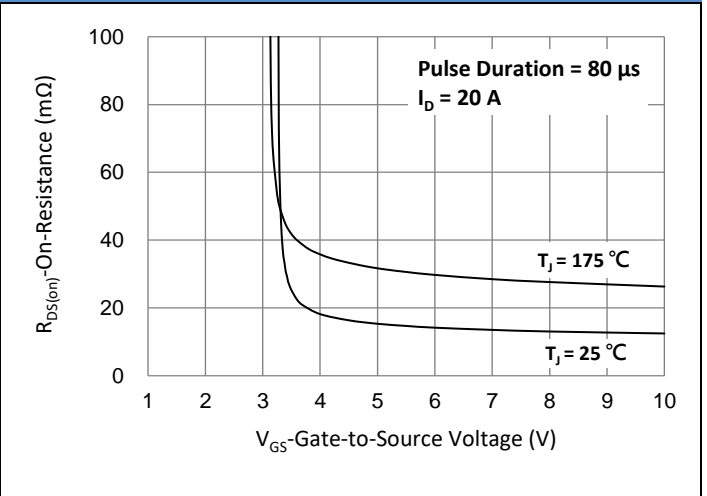


Fig.6 On-Resistance vs. Gate-Source Voltage

TYPICAL CHARACTERISTIC CURVES

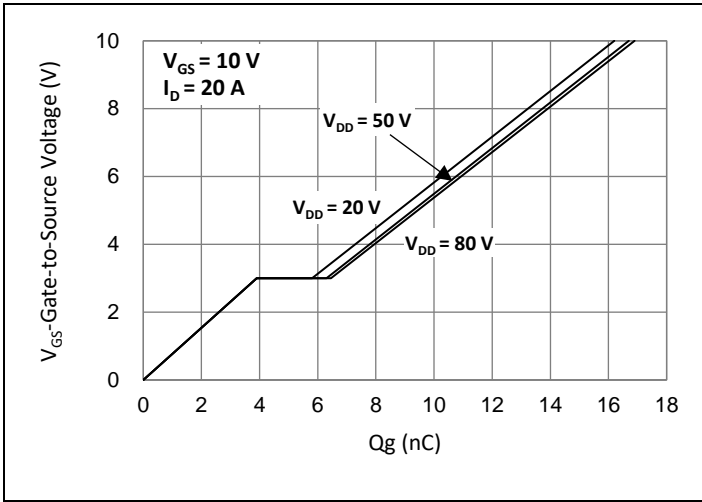


Fig.7 Gate-Charge Characteristics

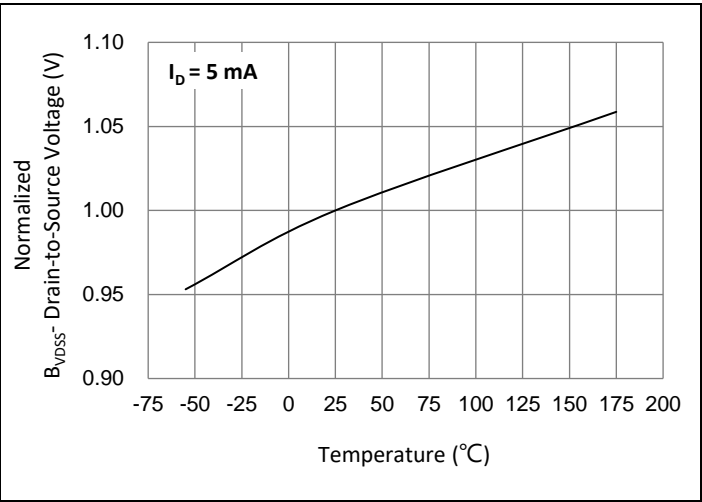


Fig.8 Breakdown Voltage Variation vs. Temperature

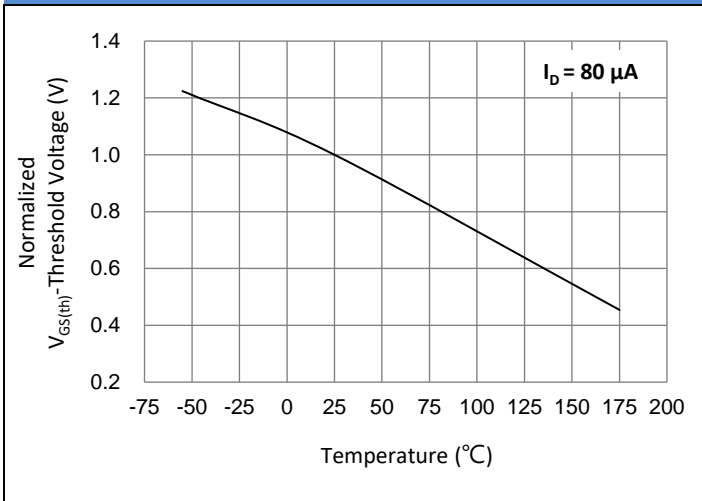


Fig.9 Threshold Voltage Variation with Temperature

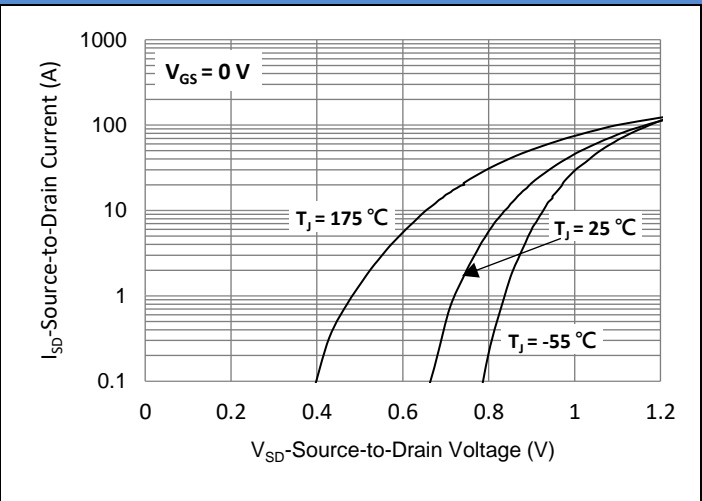


Fig.10 Source-Drain Diode Forward Voltage

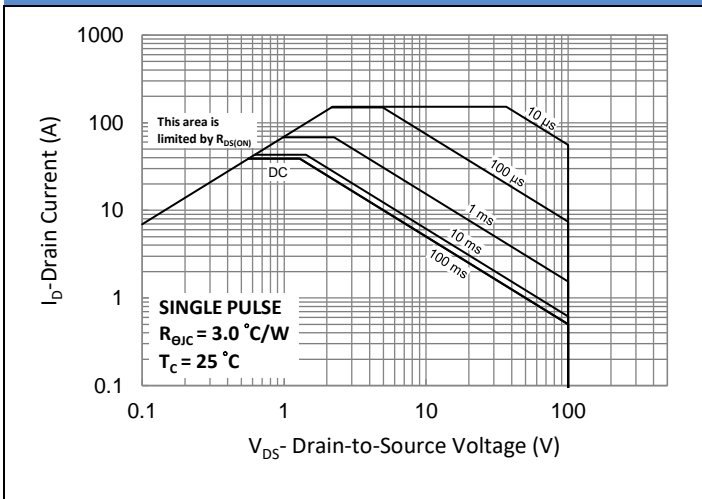


Fig.11 Maximum Safe Operating Area

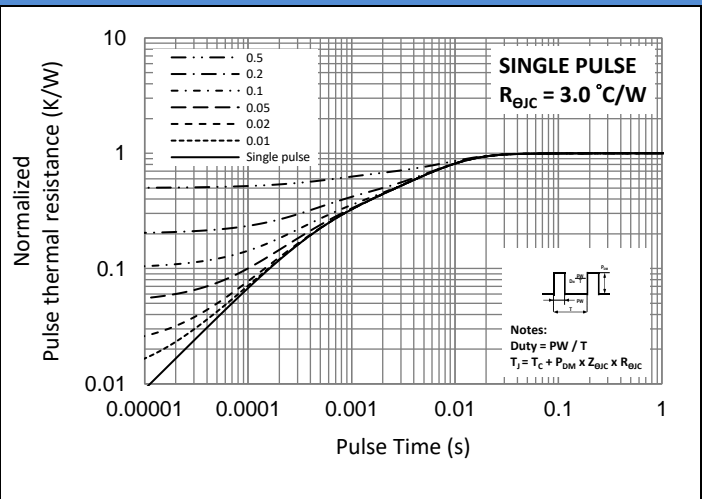
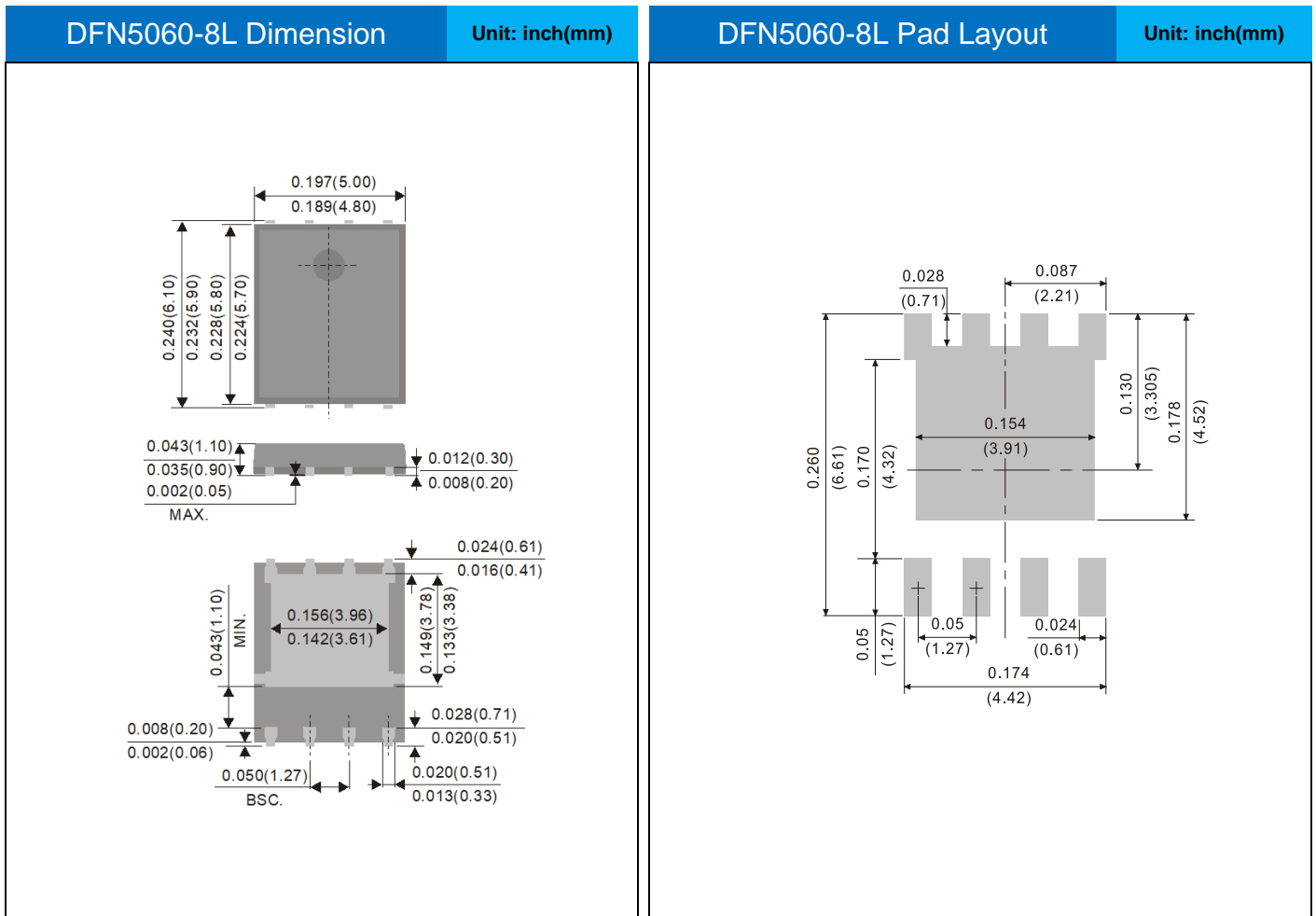


Fig.12 Normalized Transient Thermal Impedance

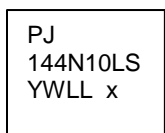
Product and Packing Information

Part No.	Package Type	Packing Type	Marking
PSMQC144N10LS2	DFN5060-8L	3000pcs / 13" reel	144N10LS

Packaging Information & Mounting Pad Layout



Marking Diagram



- Y** = Year Code
- W** = Week Code (A~Z)
- LL** = Lot Code (00~99)
- x** = Production Line Code

Disclaimer

- Reproducing and modifying information of the document is prohibited without permission from Panjit International Inc.
- Panjit International Inc. reserves the rights to make changes of the content herein the document anytime without notification. Please refer to our website for the latest document.
- Panjit International Inc. disclaims any and all liability arising out of the application or use of any product including damages incidentally and consequentially occurred.
- Panjit International Inc. does not assume any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.
- Applications shown on the herein document are examples of standard use and operation. Customers are responsible in comprehending the suitable use in particular applications. Panjit International Inc. makes no representation or warranty that such applications will be suitable for the specified use without further testing or modification.
- The products shown herein are not designed and authorized for equipments requiring high level of reliability or relating to human life and for any applications concerning life-saving or life-sustaining, such as medical instruments, transportation equipment, aerospace machinery et cetera. Customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Panjit International Inc. for any damages resulting from such improper use or sale.
- Since Panjit uses lot number as the tracking base, please provide the lot number for tracking when complaining.