

**100V N-Channel Enhancement Mode MOSFET**

<b>Voltage</b>	<b>100 V</b>	<b>R<sub>DS(ON)</sub></b>	<b>9.5 mΩ</b>
<b>Current</b>	<b>54 A</b>	<b>Q<sub>G</sub> (TYP)</b>	<b>15.7 nC</b>

**Feature**

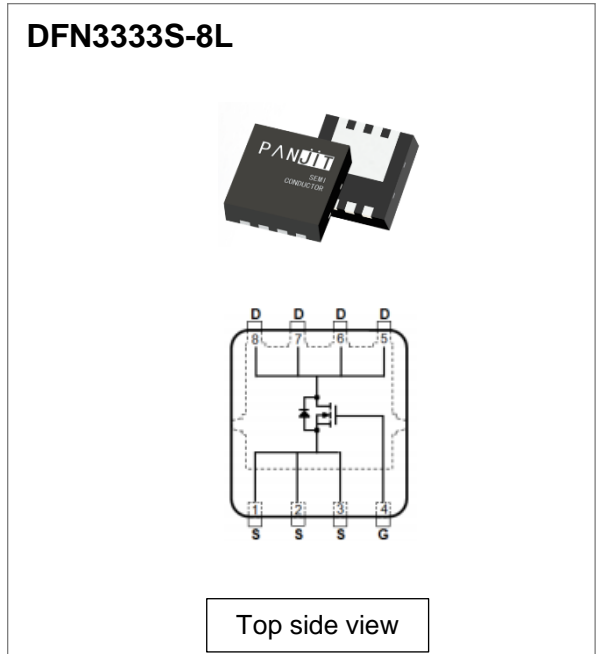
- R<sub>DS(ON)</sub> < 9.5 mΩ at V<sub>GS</sub> = 10 V, I<sub>D</sub> = 30 A
- R<sub>DS(ON)</sub> < 15.0 mΩ at V<sub>GS</sub> = 7 V, I<sub>D</sub> = 15 A
- High switching speed
- Low reverse transfer capacitance
- Lead free in compliance with EU RoHS 2.0
- Green molding compound as per IEC 61249 standard
- 100% UIS / Rg test in mass production

**Mechanical Data**

- Case: DFN3333S-8L Package
- Terminals: Solderable per MIL-STD-750, Method 2026
- Approx. Weight: 0.04 gram

**Application**

- Brick Power / Server Power



**Absolute Maximum Ratings** (T<sub>A</sub> = 25 °C unless otherwise specified)

PARAMETER		SYMBOL	LIMIT	UNITS	
Drain-Source Voltage		V <sub>DS</sub>	100	V	
Gate-Source Voltage		V <sub>GS</sub>	±20		
Continuous Drain Current (Note 3)	T <sub>C</sub> =25 °C	I <sub>D</sub>	54	A	
	T <sub>C</sub> =100 °C		38		
Pulsed Drain Current		T <sub>C</sub> =25 °C	I <sub>DM</sub>	218	A
Single Pulse Avalanche Current (Note 5)		I <sub>AS</sub>	24	A	
Single Pulse Avalanche Energy (Note 5)		E <sub>AS</sub>	29	mJ	
Power Dissipation	T <sub>C</sub> =25 °C	P <sub>D</sub>	60	W	
	T <sub>C</sub> =100 °C		30		
Operating Junction and Storage Temperature Range		T <sub>J</sub> , T <sub>STG</sub>	-55~175	°C	

**Thermal Characteristics**

PARAMETER	SYMBOL	VALUES			UNITS	
		MIN.	TYP.	MAX.		
Thermal Resistance	Junction-to-Case (Bottom)	R <sub>θJC</sub>	-	1.7	2.5	°C/W
	Junction-to-Ambient (Note 4)	R <sub>θJA</sub>	-	-	60	°C/W

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

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNITS
<b>Static Characteristics</b>						
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)	$R_{DS(on)}$	$V_{GS}=10\text{ V}, I_D=30\text{ A}$	-	8.2	9.5	m $\Omega$
		$V_{GS}=7\text{ V}, I_D=15\text{ A}$	-	12	15.0	
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=100\text{ V}, V_{GS}=0\text{ V}$	-	-	1	$\mu\text{A}$
Gate-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20\text{ V}, V_{DS}=0\text{ V}$	-	-	$\pm 100$	nA
<b>Dynamic Characteristics</b> (Note 6)						
Total Gate Charge	$Q_g$	$V_{DS}=50\text{ V}, I_D=30\text{ A}, V_{GS}=10\text{ V}$	-	15.7	20.4	nC
Gate-Source Charge	$Q_{gs}$		-	7.4	-	
Gate-Drain Charge	$Q_{gd}$		-	3.4	-	
Gate Plateau Voltage	$V_{plateau}$		-	5.4	-	V
Input Capacitance	$C_{iss}$	$V_{DS}=50\text{ V}, V_{GS}=0\text{ V}, f=250\text{ kHz}$	-	1351	1756	pF
Output Capacitance	$C_{oss}$		-	449	584	
Reverse Transfer Capacitance	$C_{rss}$		-	8	-	
Output Charge	$Q_{oss}$	$V_{DS}=50\text{ V}, V_{GS}=0\text{ V}$	-	34	44.5	nC
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=50\text{ V}, I_D=30\text{ A}, V_{GS}=10\text{ V},$ $R_G=3\text{ }\Omega$ (Note 2)	-	8.6	-	ns
Rise Time	$t_r$		-	2.9	-	
Turn-Off Delay Time	$t_{d(off)}$		-	12	-	
Fall Time	$t_f$		-	3.3	-	
Gate Resistance	$R_g$	$f=1.0\text{ MHz}$	-	1.1	2.3	$\Omega$
<b>Drain-Source Diode</b>						
Diode Forward Voltage	$V_{SD}$	$I_S=30\text{ A}, V_{GS}=0\text{ V}$	-	0.9	1.2	V
Reverse Recovery Charge	$Q_{rr}$	$I_F=30\text{ A}, V_{DD}=50\text{ V},$	-	64	-	nC
Reverse Recovery Time	$T_{rr}$	$di/dt=100\text{ A}/\mu\text{s}$	-	51	-	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 inch<sup>2</sup> with 2oz.square pad of copper.
5.  $E_{AS}$  is calculated based on the condition of  $L = 0.1\text{ mH}$ ,  $I_{AS} = 24\text{ A}$ ,  $V_{DD} = 50\text{ V}$ ,  $V_{GS} = 10\text{ V}$ . 100% test in production.
6. Guaranteed by design, not subject to production testing.

TYPICAL CHARACTERISTIC CURVES

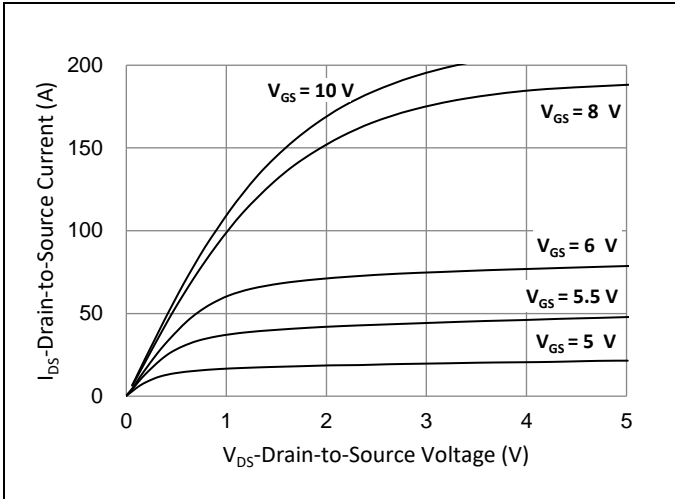


Fig.1 Output Characteristics

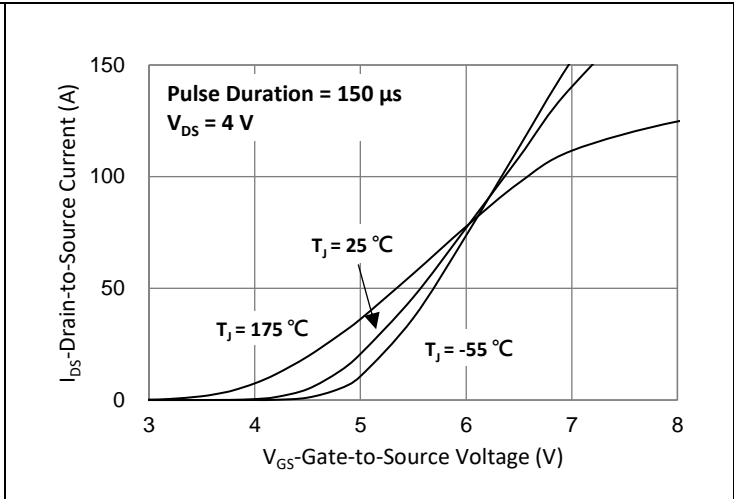


Fig.2 Transfer Characteristics

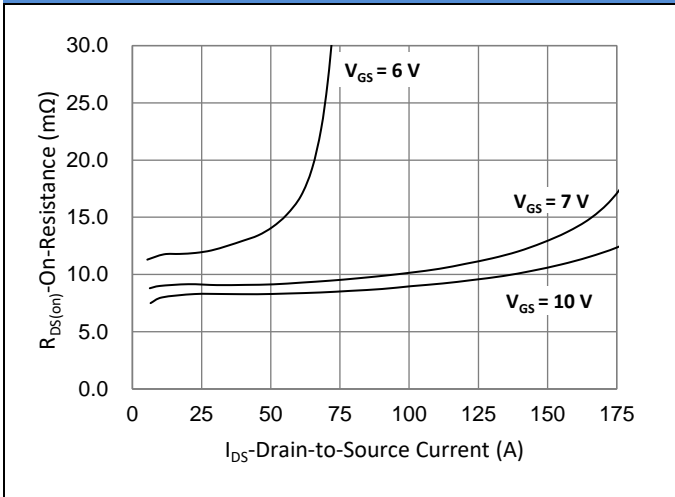


Fig.3 On-Resistance vs. Drain Current

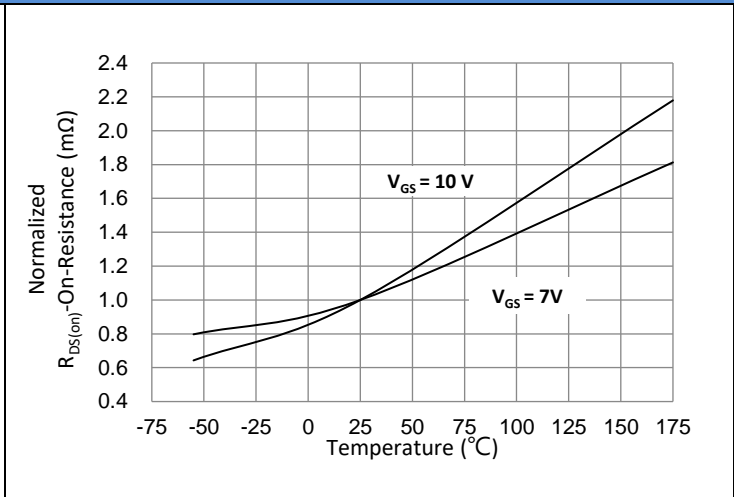


Fig.4 On-Resistance vs. Junction temperature

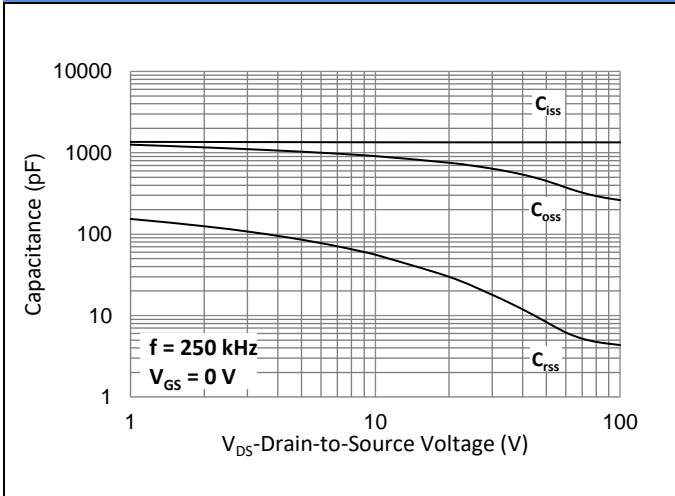


Fig.5 Capacitance vs. Drain-Source Voltage

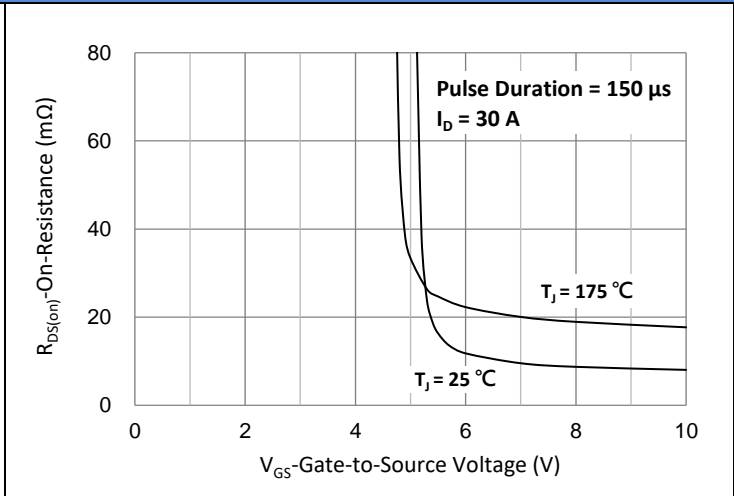


Fig.6 On-Resistance vs. Gate-Source Voltage

TYPICAL CHARACTERISTIC CURVES

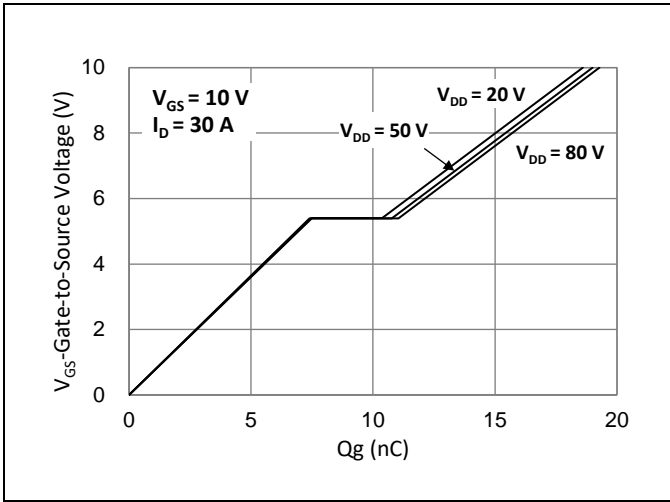


Fig.7 Gate-Charge Characteristics

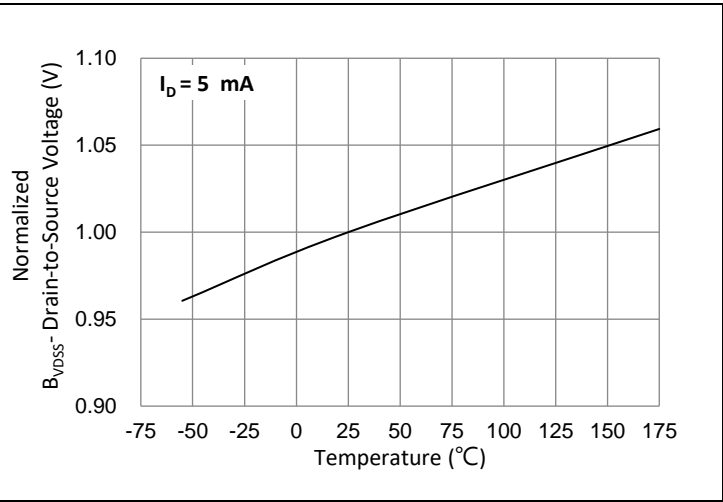


Fig.8 Breakdown Voltage Variation vs. Temperature

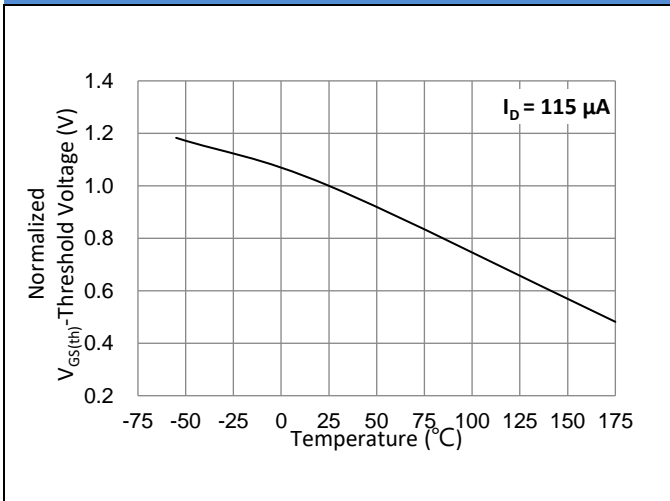


Fig.9 Threshold Voltage Variation with Temperature

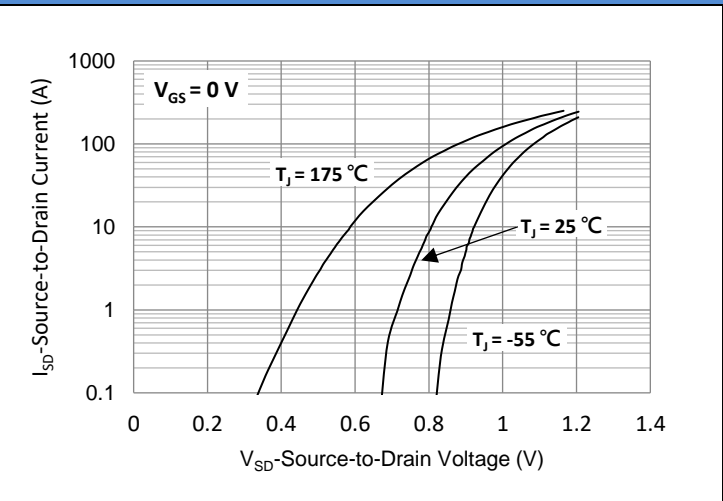


Fig.10 Source-Drain Diode Forward Voltage

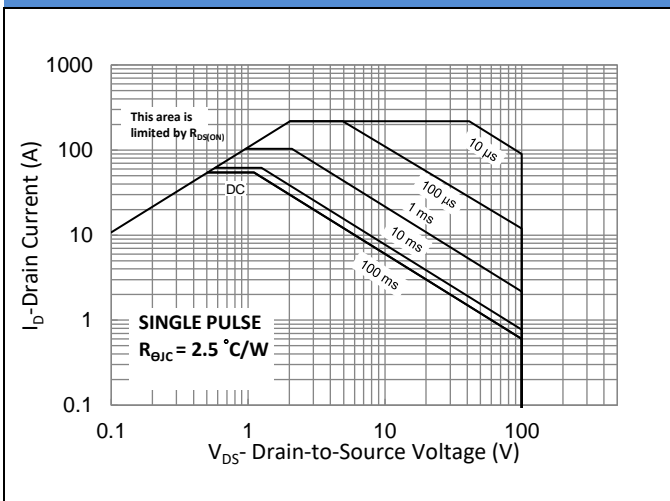


Fig.11 Maximum Safe Operating Area

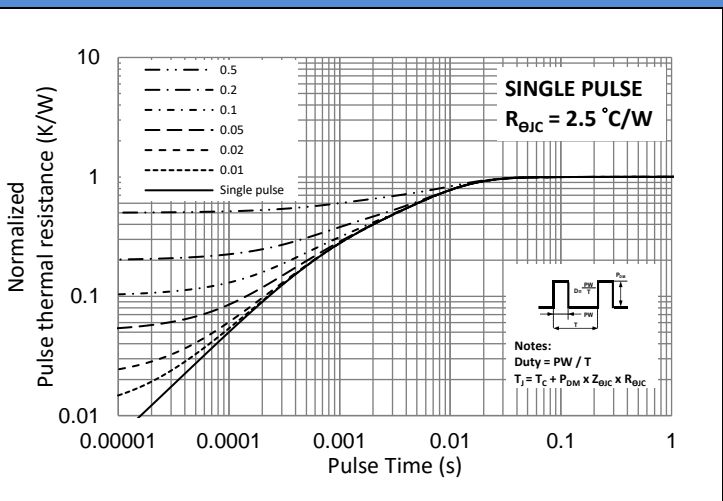
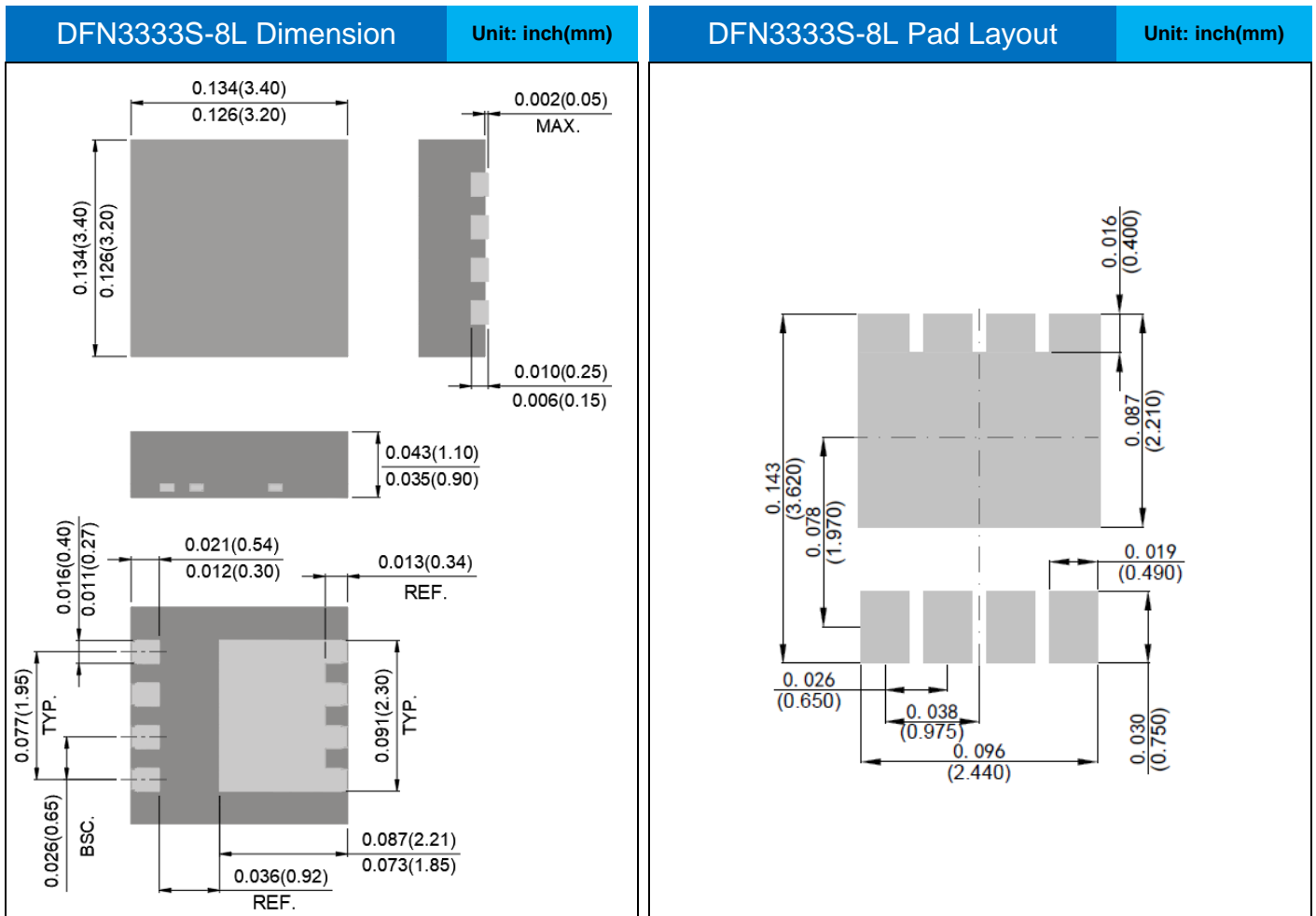


Fig.12 Normalized Transient Thermal Impedance

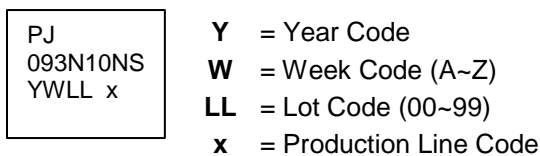
**Product and Packing Information**

Part No.	Package Type	Packing Type	Marking
PSMQE093N10NS2	DFN3333S-8L	5000pcs / 13" reel	093N10NS

**Packaging Information & Mounting Pad Layout**



**Marking Diagram**



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