

General Features

- Low On-Resistance
- 100% avalanche tested
- Fast Switching Speed
- Excellent package for good heat dissipation

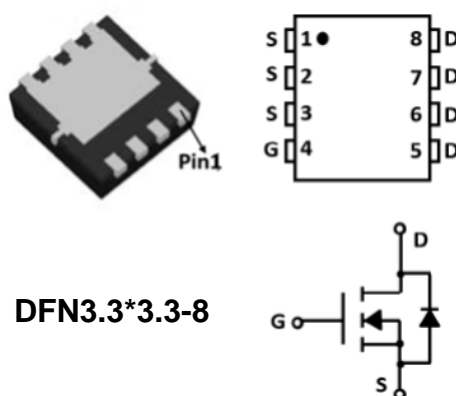
Application

- DC/DC Converters
- On board power for server
- Synchronous rectification

Product Summary



V_{DS}	40	V
$R_{DS(on), Typ @ V_{GS}=10 V}$	6.0	m Ω
I_D	40	A



DFN3.3*3.3-8

Absolute Maximum Ratings (T_C=25°C unless otherwise specified)

Symbol	Parameter		Max.	Units
V_{DSS}	Drain-Source Voltage		40	V
V_{GSS}	Gate-Source Voltage		±20	V
I_D	Continuous Drain Current	T _C = 25°C	40	A
		T _C = 100°C	32	A
I_{DM}	Pulsed Drain Current ^{note1}		160	A
EAS	Single Pulsed Avalanche Energy		50	mJ
P_D	Power Dissipation	T _C = 25°C	65	W
$R_{\theta JC}$	Thermal Resistance, Junction to Case		1.92	°C/W
T _J , T _{STG}	Operating and Storage Temperature Range		-55 to +150	°C

Electrical Characteristics ($T_C=25^\circ\text{C}$ Unless Otherwise Noted)

Symbol	Parameter	Test Condition	LIMITS			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_{DS}=250\mu A$	40	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=40V, V_{GS}=0V$	---	---	1	μA
		$T_J=125^\circ\text{C}$	---	---	30	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_{DS}=250\mu A$	1.1	1.6	2.4	V
I_{GSS}	Gate Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	± 100	nA
$R_{DS(on)}^{①}$	Drain-Source On-state Resistance	$V_{GS}=4.5V, I_{DS}=20A$	---	7.5	12	$m\Omega$
		$V_{GS}=10V, I_{DS}=30A$	---	6.0	8.5	$m\Omega$
Diode Characteristics						
$V_{SD}^{①}$	Diode Forward Voltage	$I_{SD}=20A, V_{GS}=0V$	---	---	1.2	V
t_{rr}	Reverse Recovery Time	$I_{SD}=20A, di_{SD}/dt=100A/\mu s$	---	14	---	ns
Q_{rr}	Reverse Recovery Charge		---	32	---	nC
Dynamic Characteristics ^②						
R_G	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$	---	1.2	---	Ω
C_{iss}	Input Capacitance	$V_{GS}=0V,$ $V_{DS}=20V,$ Frequency=1.0MHz	---	1733	---	pF
C_{oss}	Output Capacitance		---	283	---	
C_{rss}	Reverse Transfer Capacitance		---	141	---	
$t_{d(ON)}$	Turn-on Delay Time	$V_{DD}=20V, I_{DS}=20A,$ $V_{GEN}=10V, R_G=4.7\Omega$	---	6	---	ns
t_r	Turn-on Rise Time		---	10	---	
$t_{d(OFF)}$	Turn-off Delay Time		---	24	---	
t_f	Turn-off Fall Time		---	5	---	
Gate Charge Characteristics ^②						
Q_g	Total Gate Charge	$V_{DS}=32V, V_{GS}=10V,$ $I_{DS}=20A$	---	18	23	nC
Q_{gs}	Gate-Source Charge		---	2.5	---	
Q_{gd}	Gate-Drain Charge		---	5	---	

Notes:

①Pulse test; Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.

②Guaranteed by design, not subject to production testing.

Test Circuit

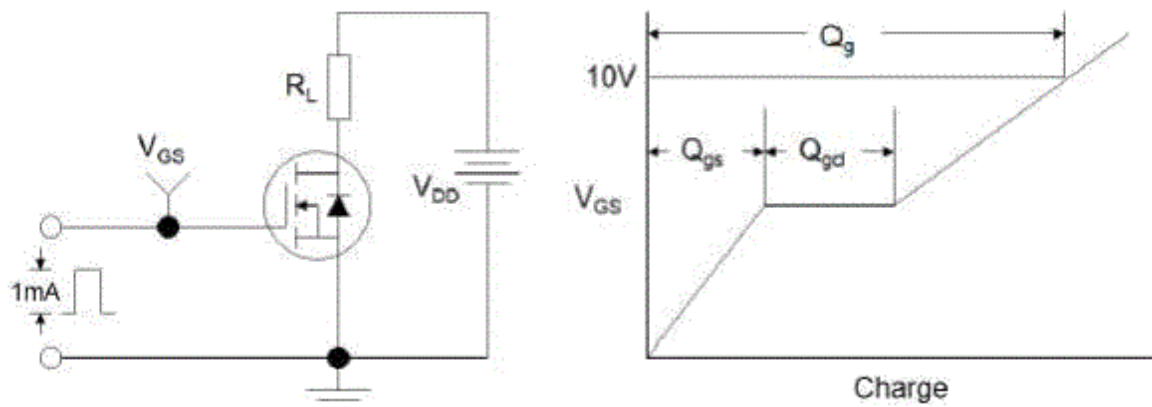


Figure1:Gate Charge Test Circuit & Waveform

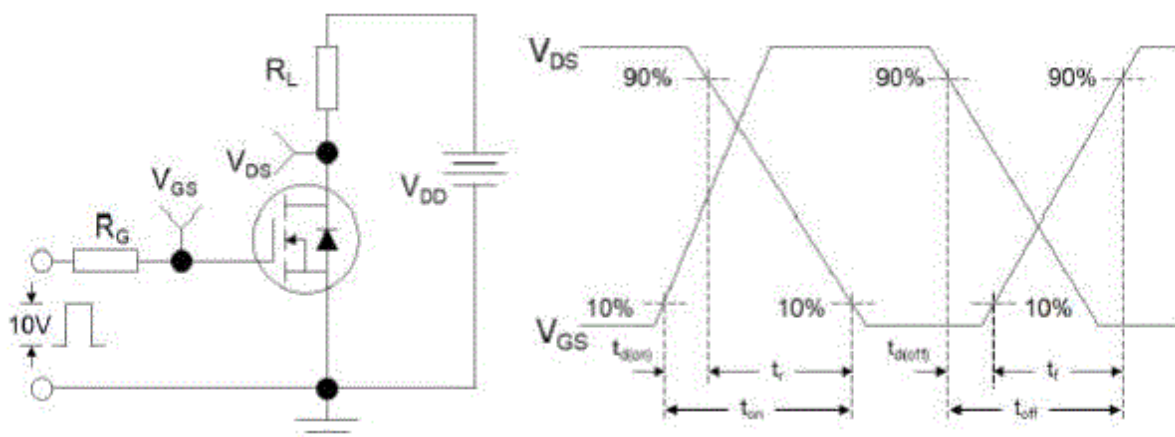


Figure 2: Resistive Switching Test Circuit & Waveforms

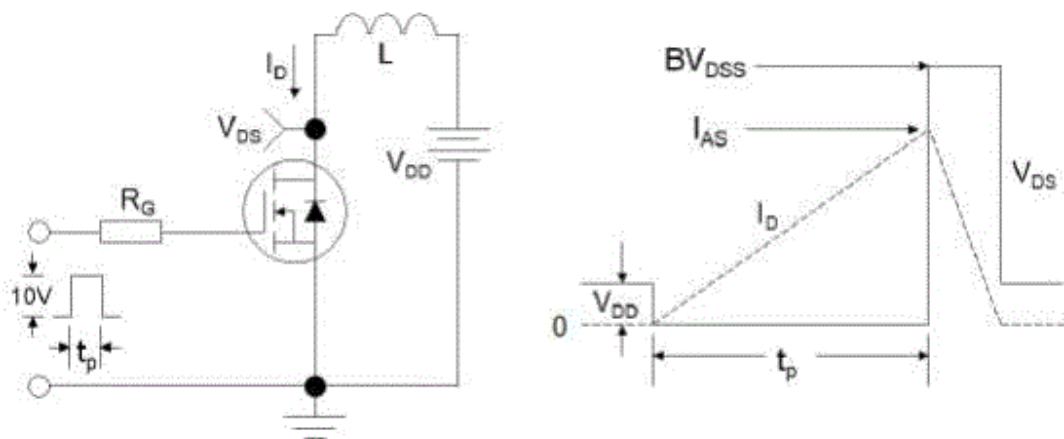
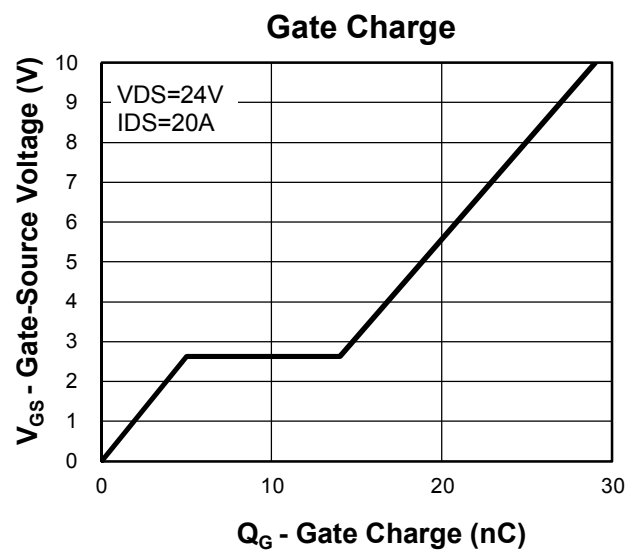
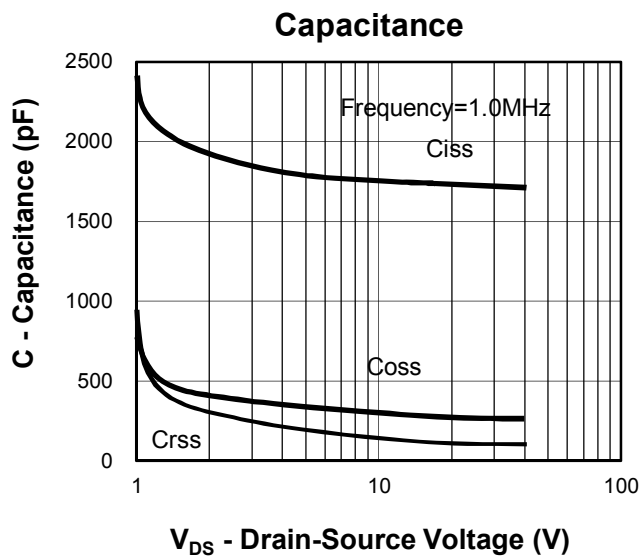
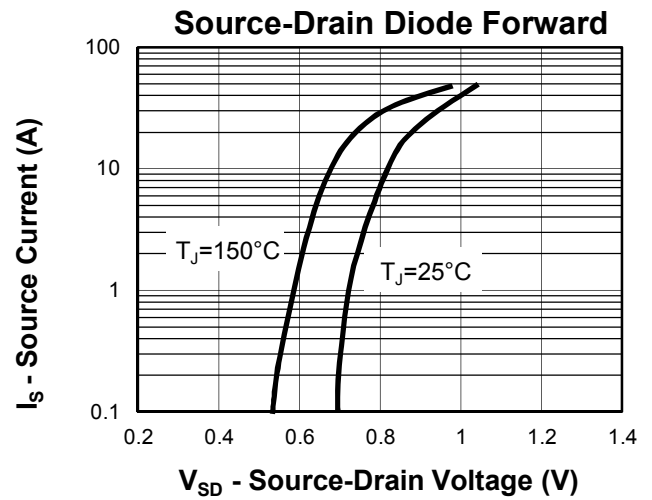
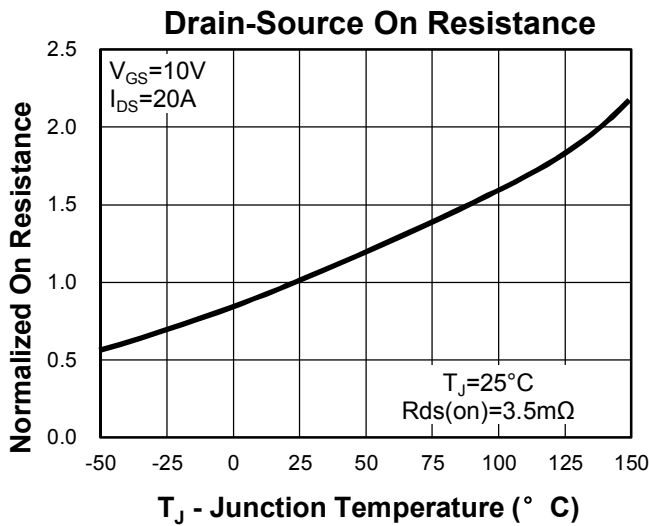
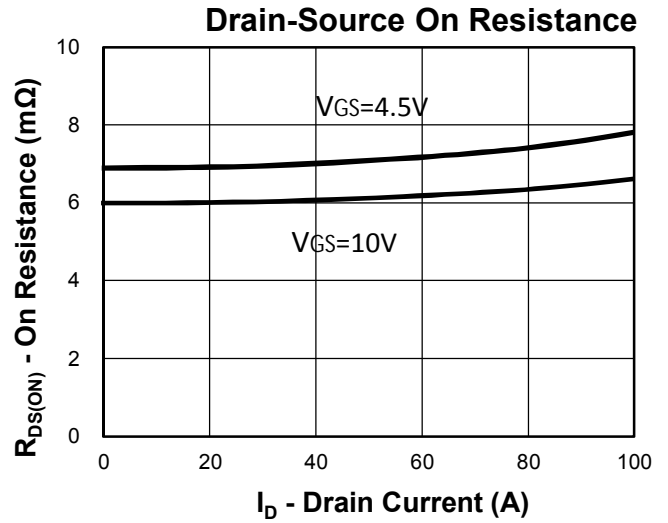
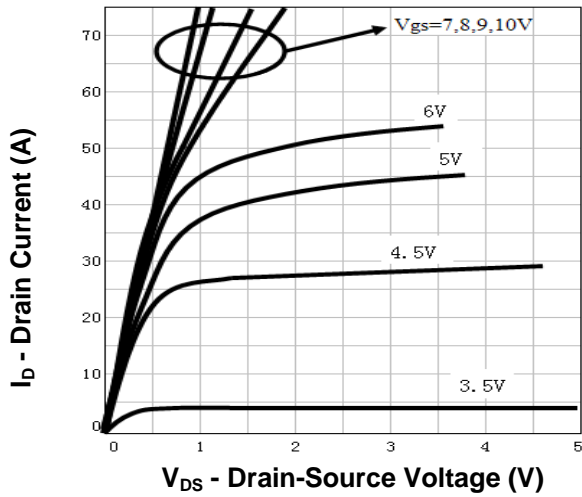
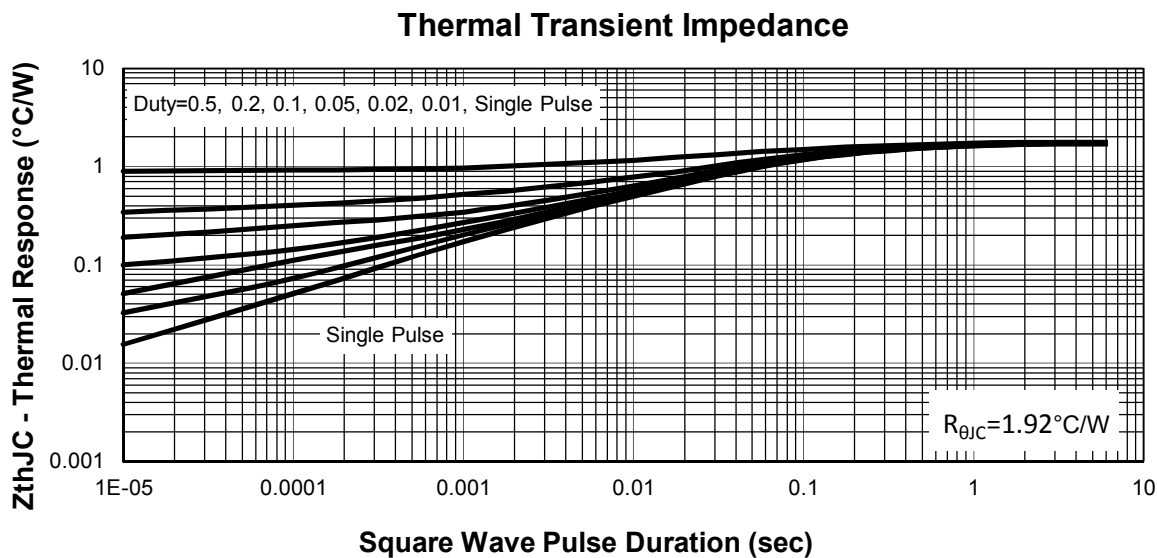
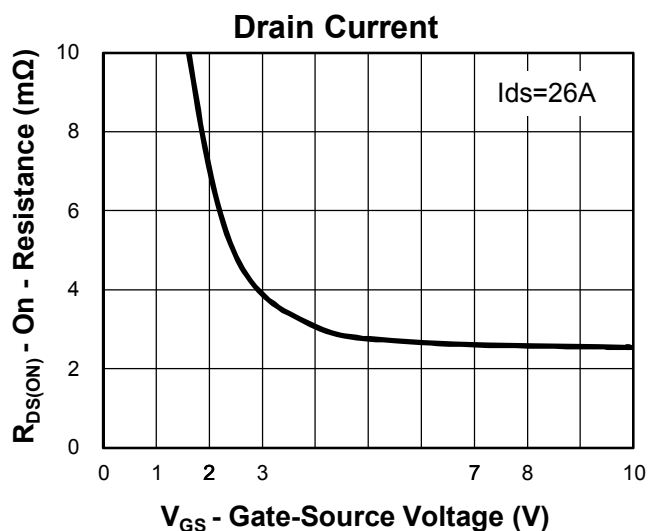
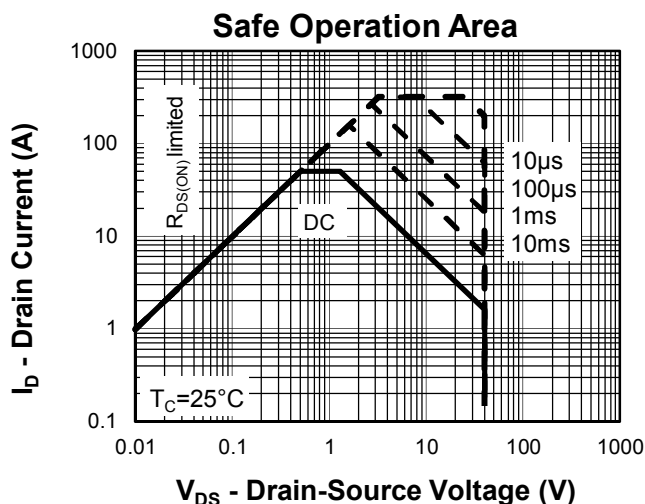
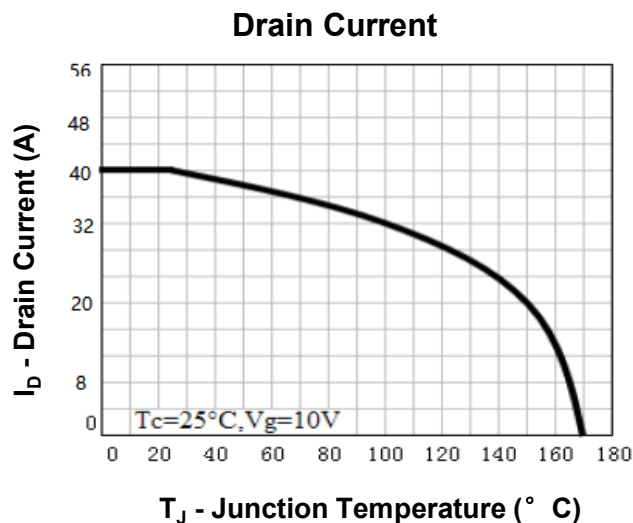
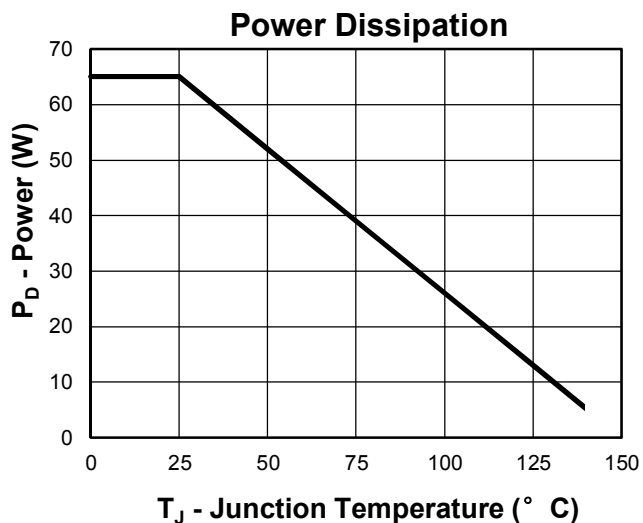


Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms

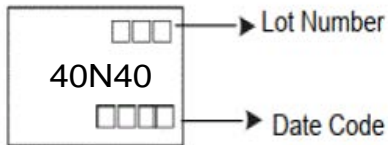
Typical Electrical and Thermal Characteristics (Curves)



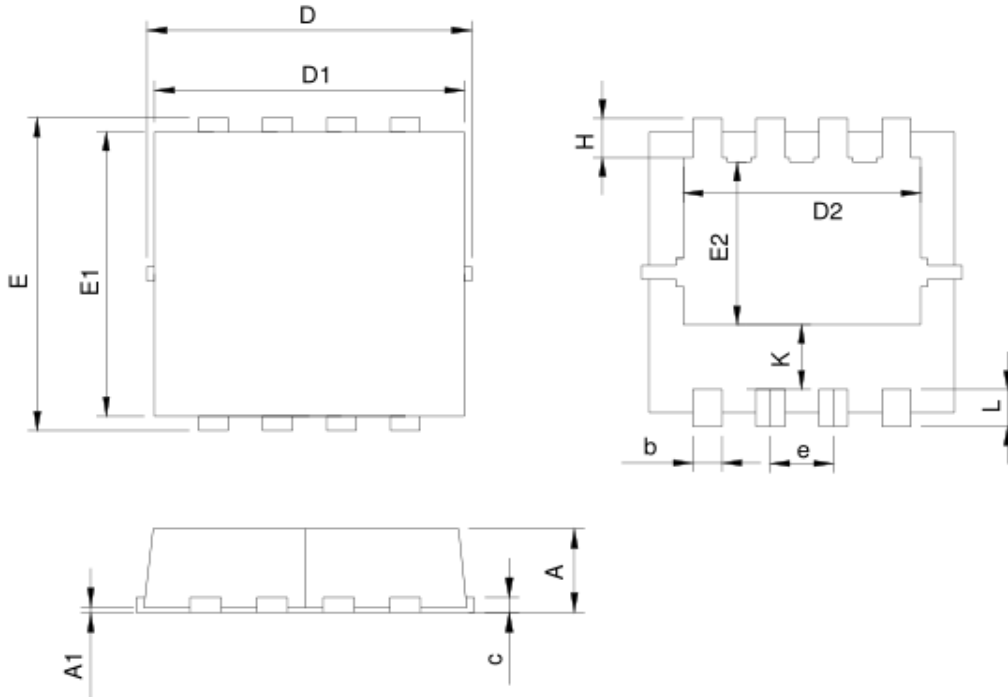


Ordering and Marking Information

Ordering Device No.	Marking	Package	Packing	Quantity
JM3N40N40E-R	40N40	DFN3.3*3.3-8	Tape&Reel	5000/Reel

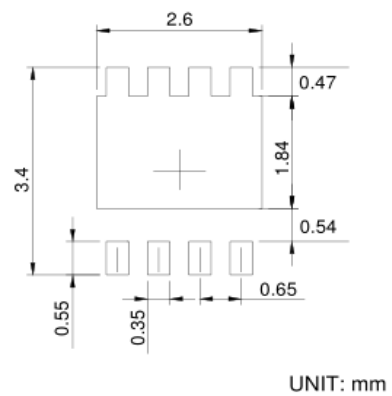
PACKAGE	MARKING
DFN3.3x3.3-8	 <p>The diagram shows a rectangular marking area containing the text '40N40'. Above the text are three small squares, with an arrow pointing to the label 'Lot Number'. Below the text are four small squares, with an arrow pointing to the label 'Date Code'.</p>

Dimensions(DFN3.3x3.3-8)



SYMBOL	DFN3.3x3.3-8			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	0.70	1.00	0.028	0.039
A1	0.00	0.05	0.000	0.002
b	0.25	0.35	0.010	0.014
c	0.14	0.20	0.006	0.008
D	3.10	3.50	0.122	0.138
D1	3.05	3.25	0.120	0.128
D2	2.35	2.55	0.093	0.100
E	3.10	3.50	0.122	0.138
E1	2.90	3.10	0.114	0.122
E2	1.64	1.84	0.065	0.072
e	0.65 BSC		0.026 BSC	
H	0.32	0.52	0.013	0.020
K	0.59	0.79	0.023	0.031
L	0.25	0.55	0.010	0.022

RECOMMENDED LAND PATTERN



UNIT: mm

Disclaimer

The content specified herein is for the purpose of introducing JMW's products (hereinafter "Products"). The information given in this document shall in no event be regarded as a guarantee of conditions or characteristics. Examples of application circuits, circuit constants and any other information contained herein illustrate the standard usage and operations of the Products. The peripheral conditions must be taken into account when designing circuits for mass production.

JMW does not assume any liability for infringement of patents, copyrights, or other intellectual property rights of third parties by or arising from the use of the Products or technical information described in this document.

The Products are not designed or manufactured to be used with any equipment, device or system which requires an extremely high level of reliability the failure or malfunction of which may result in a direct threat to human life or create a risk of human injury (such as a medical instrument, transportation equipment, aerospace machinery, nuclear-reactor controller, fuel-controller or other safety device). JMW shall bear no responsibility in any way for use of any of the Products for the above special purposes.

Although JMW endeavors to improve the quality and reliability of its products, semiconductor products have specific characteristics such as the occurrence of failure at a certain rate and malfunctions under certain use conditions. Please be sure to implement safety measures to guard them against the possibility of physical injury, and injury or damage caused by fire in the event of the failure of a JMW product.

The content specified herein is subject to change for improvement without notice. When using a JMW product, be sure to obtain the latest specifications.