Lonten N-channel 60V, 80A, 9.8mΩ Power MOSFET

Description

These N-Channel enhancement mode power field effect transistors are using split gate trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and with stand high energy pulse in the avalanche and commutation mode. These devices are well suited for high efficiency fast switching applications.

Features

- 60V,80A,$R_{DS(ON).max}$=9.8mΩ@V_{GS}=10V
- Improved dv/dt capability
- Fast switching
- 100% EAS Guaranteed
- Green device available

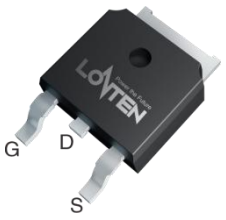
Applications

- Motor Drives
- UPS
- DC-DC Converter

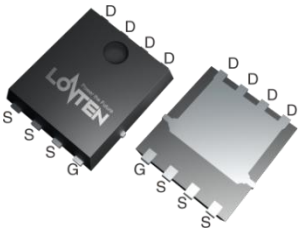
Product Summary

V_{DSS}	60V
$R_{DS(on).max}$@ V_{GS}=10V	9.8mΩ
I_D	80A

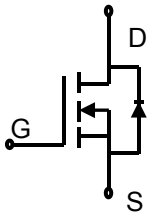
Pin Configuration



TO-252



DFN5×6



N-Channel MOSFET

Absolute Maximum Ratings

T_C = 25°C unless otherwise noted

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	60	V
Continuous drain current (T_C = 25°C)	I_D	80	A
Continuous drain current (T_C = 100°C)		50	A
Pulsed drain current (note 1)	I_{DM}	320	A
Gate-Source voltage	V_{GSS}	±20	V
Avalanche energy, single pulse (note 2)	E_{AS}	64	mJ
Power Dissipation (T_C = 25°C)	P_D	106	W
Storage Temperature Range	T_{STG}	-55 to +150	°C
Operating Junction Temperature Range	T_J	-55 to +150	°C

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	1.18	°C/W

Package Marking and Ordering Information

Device	Device Package	Marking	Units/Reel
LSGG06R098W3	TO-252	SGG06R098W3	2500
LSGN06R098W3	DFN5×6	SGN06R098W3	5000

Electrical Characteristics T_J = 25°C unless otherwise noted

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static characteristics						
Drain-source breakdown voltage	BV_{DSS}	V_{GS}=0 V, I_D=250uA	60	---	---	V
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250uA	1.1	1.7	2.3	V
Drain-source leakage current	I_{DSS}	V_{DS}=60V, V_{GS}=0V, T_J = 25°C	---	---	1	μA
		V_{DS}=48V, V_{GS}=0V, T_J = 125°C	---	---	10	μA
Gate leakage current, Forward	I_{GSSF}	V_{GS}=20 V, V_{DS}=0 V	---	---	100	nA
Gate leakage current, Reverse	I_{GSSR}	V_{GS}=-20 V, V_{DS}=0 V	---	---	-100	nA
Drain-source on-state resistance (note 3)	$R_{DS(on)}$	V_{GS}=10 V, I_D=20 A	---	8.2	9.8	mΩ
Drain-source on-state resistance (note 3)		V_{GS}=4.5 V, I_D=20 A	---	12	13.9	mΩ
Forward transconductance	g_{fs}	V_{DS} =5V , I_D=20A	---	45	---	S
Dynamic characteristics						
Input capacitance	C_{iss}	V_{DS} = 30 V, V_{GS} = 0 V, F = 1MHz	---	974	---	pF
Output capacitance	C_{oss}		---	310	---	
Reverse transfer capacitance	C_{rss}		---	4.58	---	
Turn-on delay time (note 3,4)	$t_{d(on)}$	V_{DD} = 30V,V_{GS}=10V, I_D = 20A	---	11	---	ns
Rise time (note 3,4)	t_r		---	65	---	
Turn-off delay time (note 3,4)	$t_{d(off)}$		---	44	---	
Fall time (note 3,4)	t_f		---	11	---	
Gate resistance	R_g	V_{GS}=0V, V_{DS}=0V, F=1MHz	---	2.2	---	Ω
Gate charge characteristics						
Gate to source charge (note 3,4)	Q_{gs}	V_{DS}=30 V, I_D=20A, V_{GS}= 10 V	---	3.6	---	nC
Gate to drain charge (note 3,4)	Q_{gd}		---	2.5	---	
Gate charge total (note 3,4)	Q_g		---	16.5	---	
Drain-Source diode characteristics and Maximum Ratings						
Continuous Source Current	I_S	V_G=V_D=0 V, Force Current	---	---	120	A
Pulsed Source Current (note 3)	I_{SM}		---	---	480	A
Diode Forward Voltage (note 3)	V_{SD}	V_{GS}=0V, I_S=50A, T_J=25℃	---	---	1.4	V
Reverse Recovery Time	t_{rr}	I_S=20A, di/dt=100A/us, T_J=25℃	---	50	---	ns
Reverse Recovery Charge	Q_{rr}		---	30	---	nC

Notes:

1: Repetitive Rating: Pulse width limited by maximum junction temperature.

2: V_{DD}=35V, V_{GS}=10V, L=0.5mH, I_{AS}=16A, R_G=25Ω, Starting T_J=25℃.

3: Pulse Test：Pulse Width ≤300μs, Duty Cycle≤2%.

4: Essentially independent of operating temperature.

Electrical Characteristics Diagrams

Figure 1. Typ. Output Characteristics

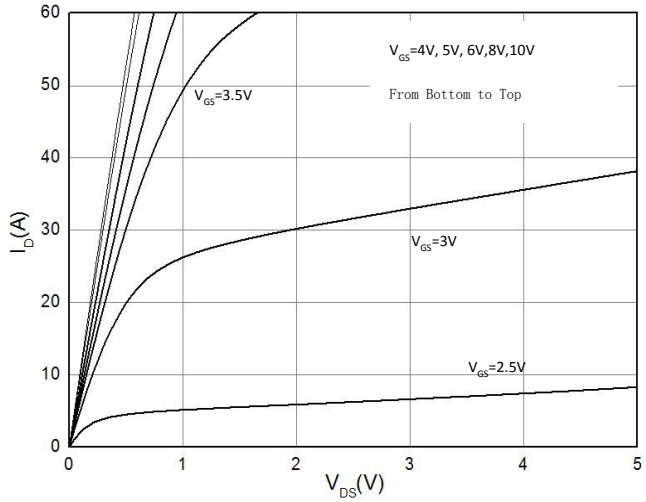


Figure 2. Transfer Characteristics

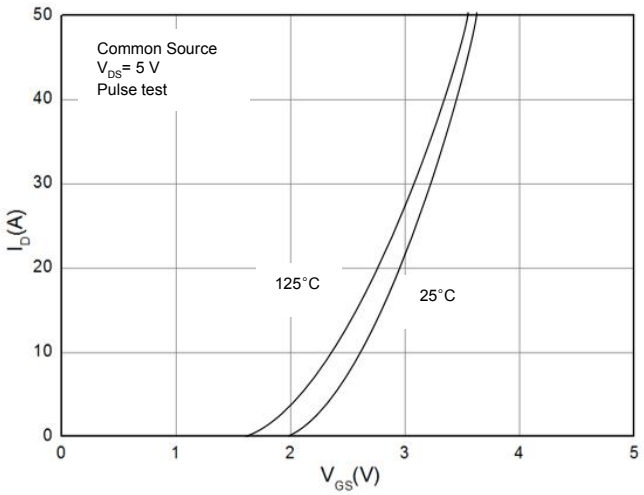


Figure 3. Capacitance Characteristics

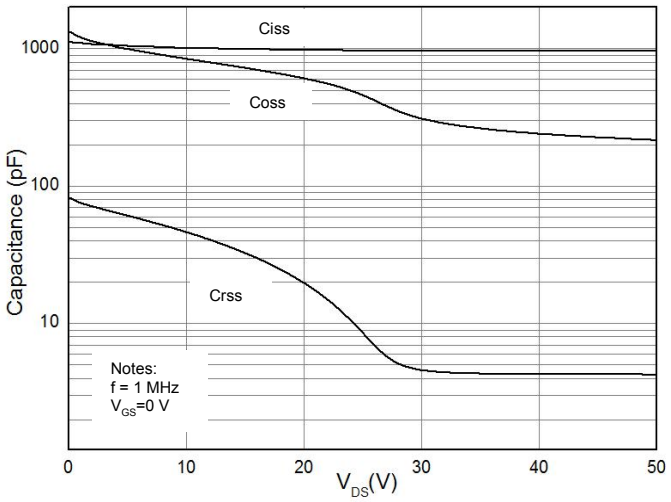


Figure 4. Gate Charge Waveform

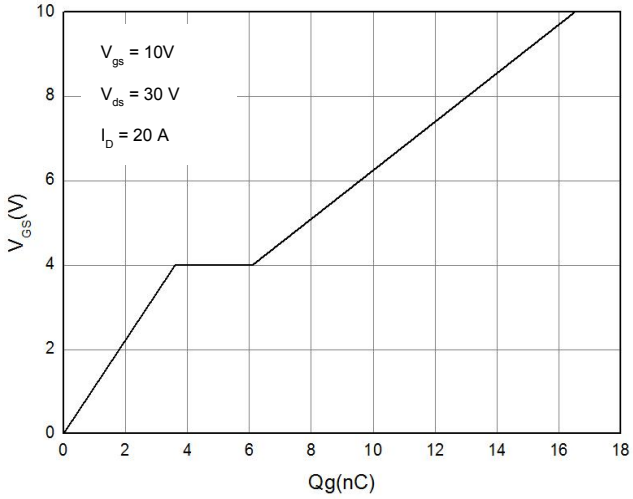


Figure 5. Body-Diode Characteristics

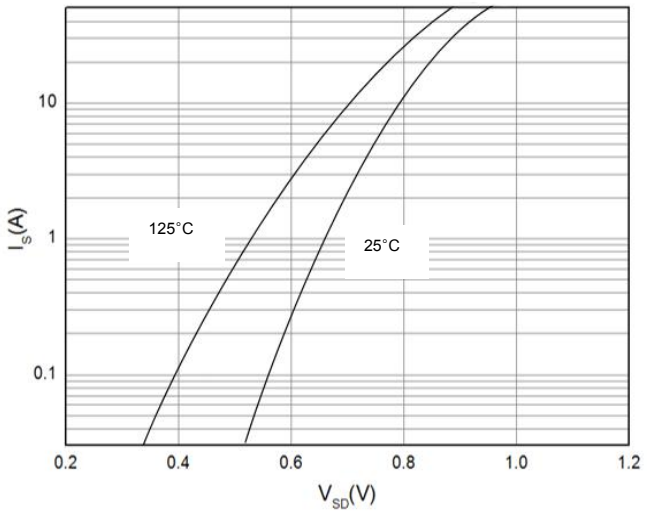


Figure 6. Rdson-Drain Current

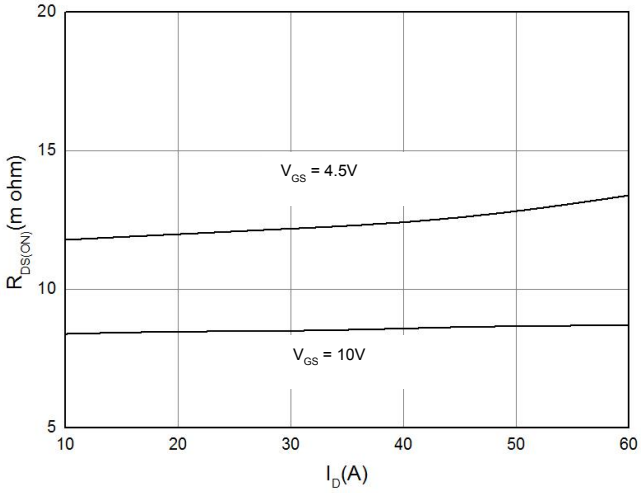


Figure 7. Rdson-Junction Temperature(℃)

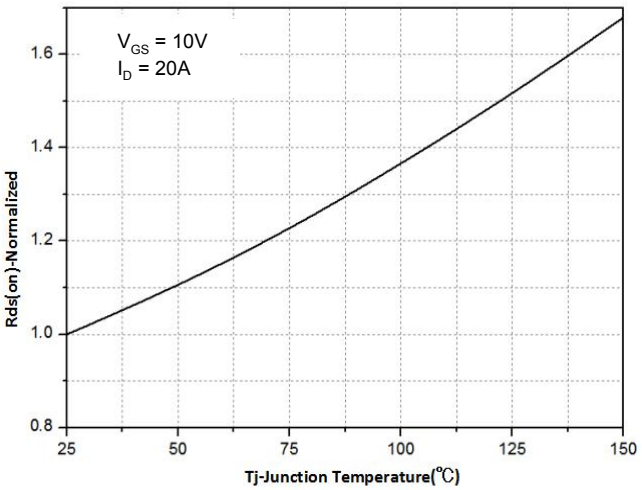


Figure 8. Maximum Safe Operating Area

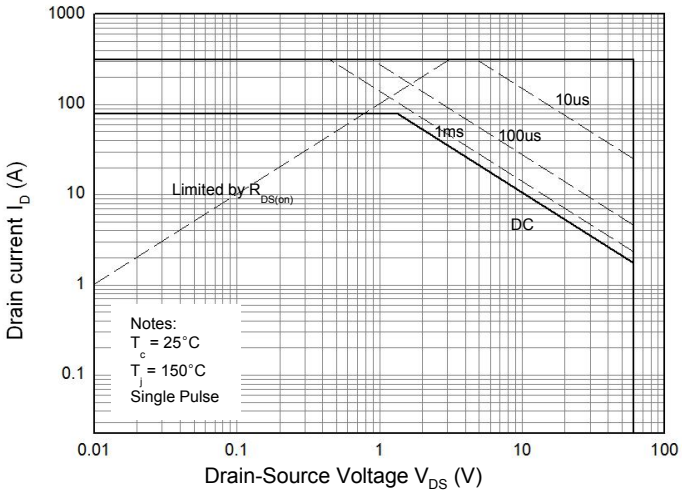
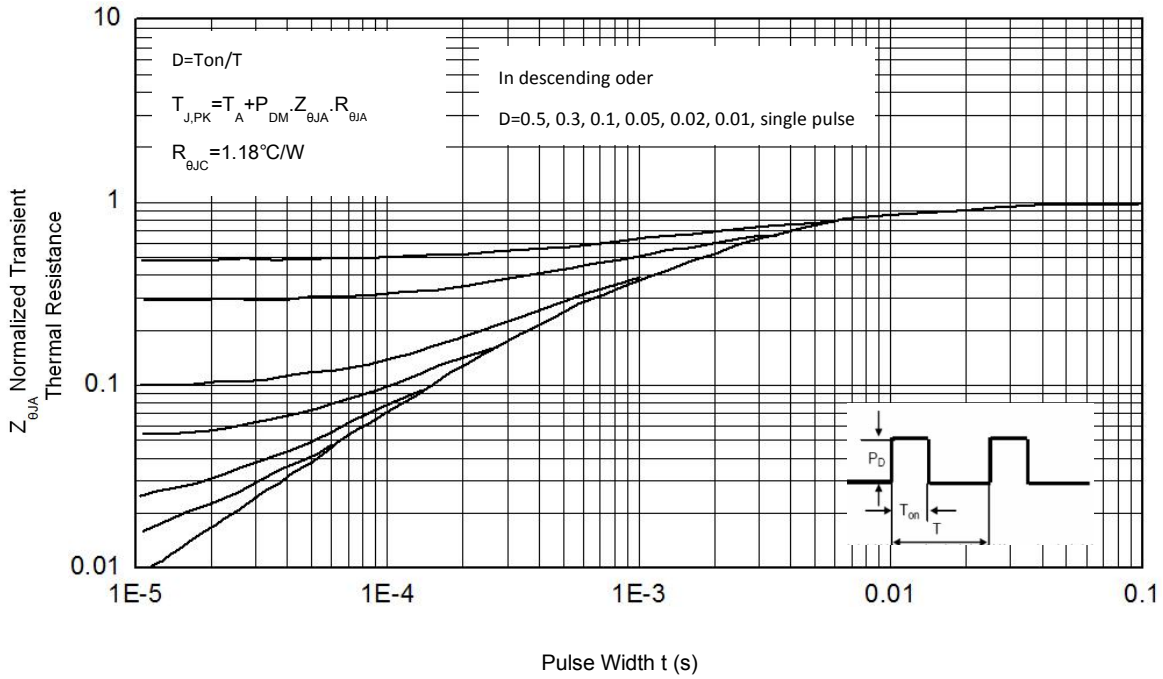


Figure 9. Normalized Maximum Transient Thermal Impedance (RthJC)



Test Circuit & Waveform

Figure 8. Gate Charge Test Circuit & Waveform

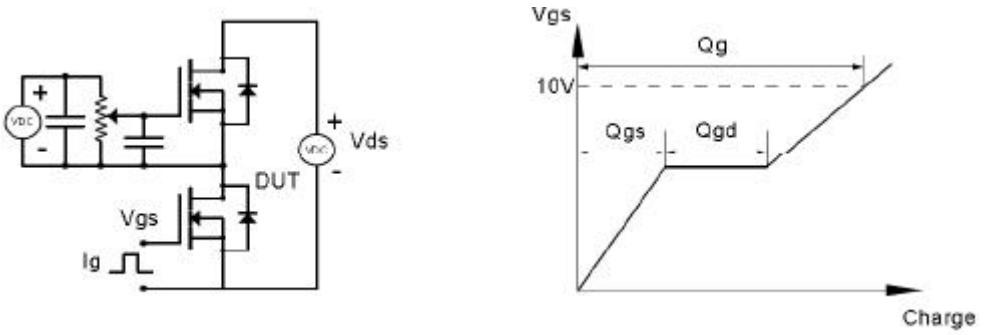


Figure 9. Resistive Switching Test Circuit & Waveforms

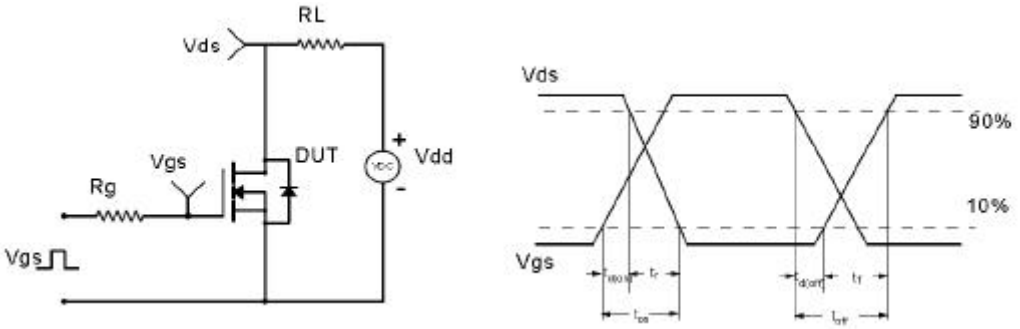


Figure 10. Unclamped Inductive Switching (UIS) Test Circuit & Waveform

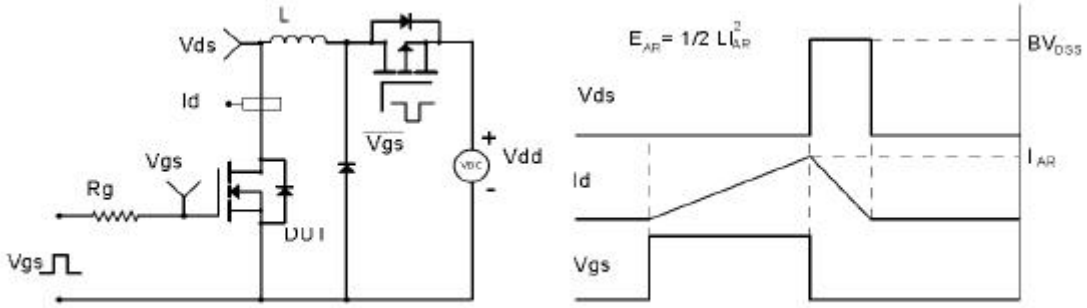
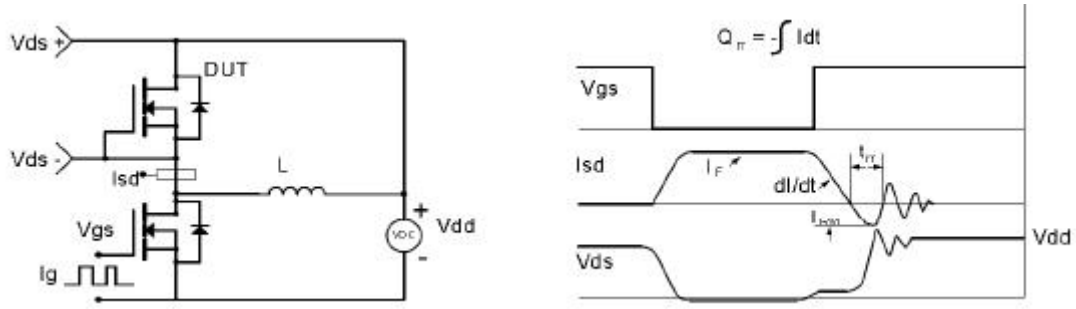
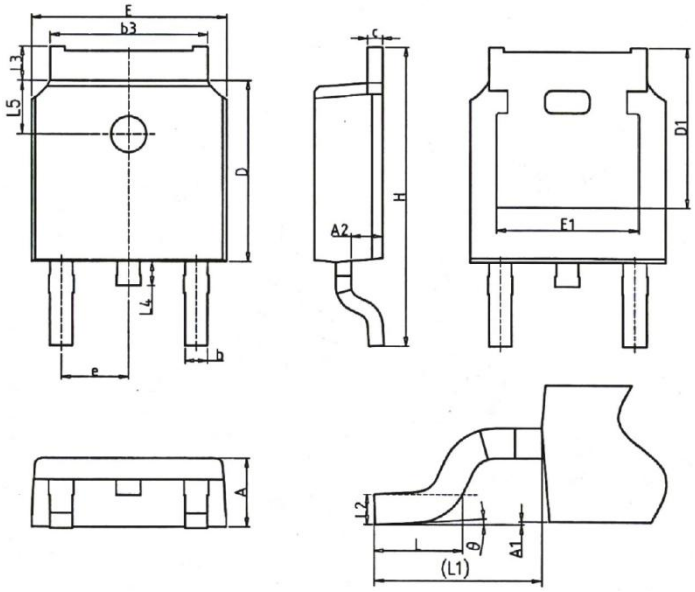


Figure 11. Diode Recovery Circuit & Waveform

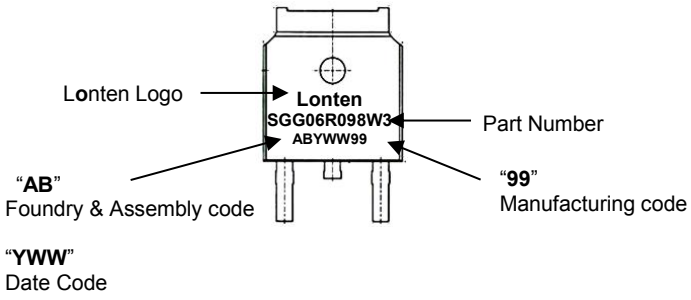


Mechanical Dimensions for TO-252

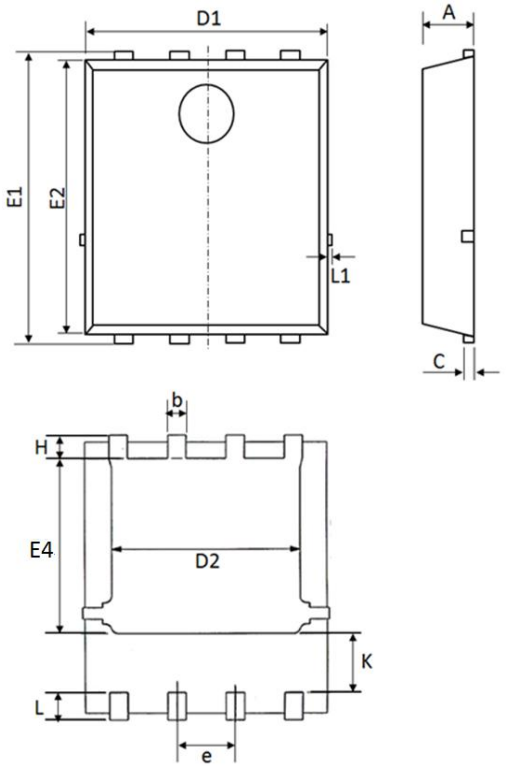


COMMON DIMENSIONS						
SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX
A	2.20	2.30	2.38	0.087	0.091	0.094
A1	0.00	-	0.20	0.000	-	0.008
A2	0.97	1.07	1.17	0.038	0.042	0.046
b	0.68	0.78	0.90	0.027	0.031	0.035
b3	5.20	5.33	5.46	0.205	0.210	0.215
c	0.43	0.53	0.61	0.017	0.021	0.024
D	5.98	6.10	6.22	0.235	0.240	0.245
D1	5.30REF			0.209REF		
E	6.40	6.60	6.73	0.252	0.260	0.265
E1	4.63	-	-	0.182	-	-
e	2.286BSC			0.090BSC		
H	9.40	10.10	10.50	0.370	0.398	0.413
L	1.38	1.50	1.75	0.054	0.059	0.069
L1	2.90REF			0.114REF		
L2	0.51BSC			0.020BSC		
L3	0.88	-	1.28	0.035	-	0.050
L4	0.50	-	1.00	0.020	-	0.039
L5	1.65	1.80	1.95	0.065	0.071	0.077
θ	0°	-	8°	0°	-	8°

TO-252 Part Marking Information

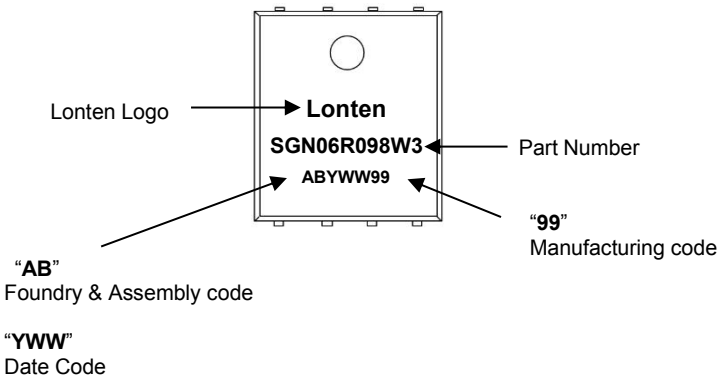


Mechanical Dimensions for DFN5×6



COMMON DIMENSIONS						
SYMBOL	MILLIMETERS			INCHS		
	MIN	NOM	MAX	MIN	NOM	MAX
A	1	1.1	1.2	0.039	0.043	0.047
b	0.3	0.4	0.5	0.012	0.016	0.020
C	0.154	0.254	0.354	0.006	0.010	0.014
D1	5	5.2	5.4	0.197	0.205	0.213
D2	3.8	4.1	4.25	0.150	0.161	0.167
E1	5.95	6.15	6.35	0.234	0.242	0.250
E2	5.66	5.86	6.06	0.223	0.231	0.239
E4	3.52	3.72	3.92	0.139	0.146	0.154
e	1.27 BSC			0.050 BSC		
H	0.4	0.5	0.6	0.016	0.020	0.024
L	0.5	0.6	0.7	0.020	0.024	0.028
L1	-	-	0.12	-	-	0.005
K	1.14	1.29	1.44	0.045	0.051	0.057

DFN5×6 Part Marking Information



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