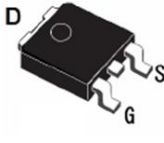
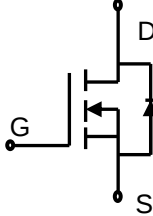


Lonten N-channel 40V, 100A, 5.0mΩ Power MOSFET

Description These N-Channel enhancement mode power field effect transistors are using 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 ◆ 40V,100A,$R_{DS(ON).max}=5.0m\Omega@V_{GS}=10V$ ◆ Improved dv/dt capability ◆ Fast switching ◆ 100% EAS Guaranteed ◆ Green device available Applications ◆ Motor Drives ◆ UPS ◆ DC-DC Converter	Product Summary <table> <tr> <td>V_{DSS}</td><td>40V</td></tr> <tr> <td>$R_{DS(on).max}@V_{GS}=10V$</td><td>5.0mΩ</td></tr> <tr> <td>I_D</td><td>100A</td></tr> </table> Pin Configuration  TO-251  TO-252  N-Channel MOSFET 	V_{DSS}	40V	$R_{DS(on).max}@V_{GS}=10V$	5.0mΩ	I_D	100A
V_{DSS}	40V						
$R_{DS(on).max}@V_{GS}=10V$	5.0mΩ						
I_D	100A						

Absolute Maximum Ratings $T_C = 25^\circ\text{C}$ unless otherwise noted

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	40	V
Continuous drain current ($T_C = 25^\circ\text{C}$)	I_D	100	A
Continuous drain current ($T_C = 100^\circ\text{C}$)		70	A
Pulsed drain current ¹⁾	I_{DM}	400	A
Gate-Source voltage	V_{GSS}	± 20	V
Avalanche energy ²⁾	E_{AS}	156	mJ
Power Dissipation ($T_C = 25^\circ\text{C}$)	P_D	100	W
Storage Temperature Range	T_{STG}	-55 to +150	$^\circ\text{C}$
Operating Junction Temperature Range	T_J	-55 to +150	$^\circ\text{C}$

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	1.25	$^\circ\text{C/W}$

Package Marking and Ordering Information

Device	Device Package	Marking
LNG04R050	TO-252	LNG04R050

Electrical Characteristics
 $T_J = 25^{\circ}\text{C}$ 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	40	---	---	V
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250uA	1.0	---	2.0	V
Drain-source leakage current	I _{DSS}	V _{DS} =40 V, V _{GS} =0 V, T _J = 25°C	---	---	1	μA
		V _{DS} =32 V, V _{GS} =0 V, T _J = 125°C	---	---	30	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	R _{DS(on)}	V _{GS} =10 V, I _D =40 A	---	3.8	5	mΩ
		V _{GS} =4.5 V, I _D =30 A	---	4.7	6.2	mΩ
Forward transconductance	g _{fs}	V _{DS} =5 V , I _D =30 A	---	79	---	S
Dynamic characteristics						
Input capacitance	C _{iss}	V _{DS} = 20 V, V _{GS} = 0 V, F = 1MHz	---	4023.6	---	pF
Output capacitance	C _{oss}		---	410.4	---	
Reverse transfer capacitance	C _{rss}		---	338.5	---	
Turn-on delay time	t _{d(on)}	V _{DD} = 30V,V _{GS} =10V, I _D =30 A	---	231.6	---	ns
Rise time	t _r		---	213.6	---	
Turn-off delay time	t _{d(off)}		---	219.2	---	
Fall time	t _f		---	74	---	
Gate resistance	R _g	V _{GS} =0V, V _{DS} =0V, F=1MHz	---	2.4	---	Ω
Gate charge characteristics						
Gate to source charge	Q _{gs}	V _{DS} =30 V, I _D =30A, V _{GS} =10V	---	11	---	nC
Gate to drain charge	Q _{gd}		---	16.7	---	
Gate charge total	Q _g		---	66.7	---	
Drain-Source diode characteristics and Maximum Ratings						
Continuous Source Current	I _S		---	---	100	A
Pulsed Source Current ³⁾	I _{SM}		---	---	400	A
Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =40A, T _J =25°C	---	---	1.2	V
Reverse Recovery Time	t _{rr}	I _S =20A,di/dt=100A/us, T _J =25°C	---	41.4	---	ns
Reverse Recovery Charge	Q _{rr}		---	29	---	nC

Notes:

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

2: $V_{DD}=20\text{ V}, V_{GS}=10\text{ V}, L=0.5\text{ mH}, I_{AS}=25\text{ A}, R_G=25\Omega$, Starting $T_J=25^{\circ}\text{C}$.

3: Pulse Test: Pulse Width $\leq 300\mu\text{ s}$, Duty Cycle $\leq 2\%$.

Electrical Characteristics Diagrams

Figure 1. Typ. Output Characteristics

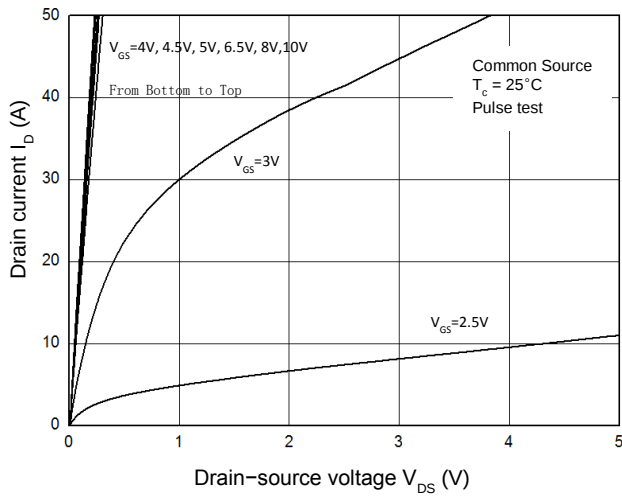


Figure 2. Transfer Characteristics

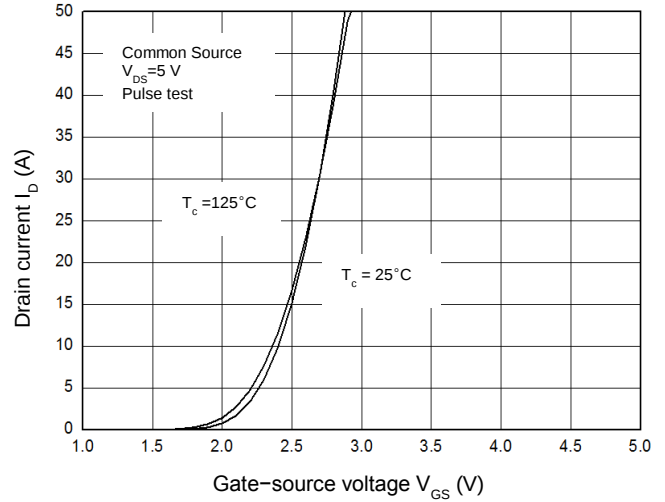


Figure 3. Capacitance Characteristics

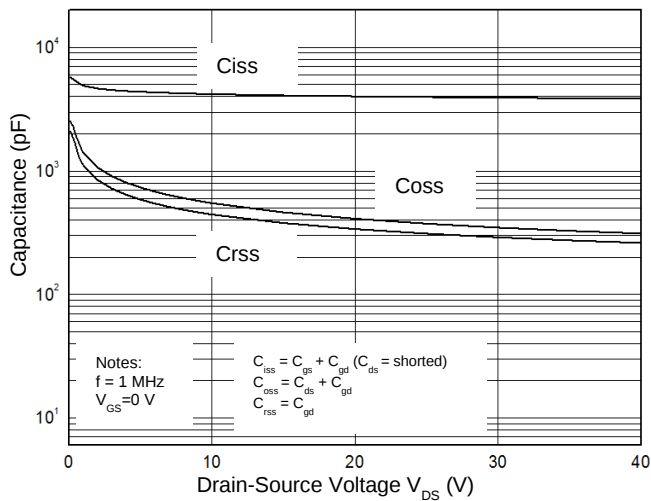


Figure 4. Gate Charge Waveform

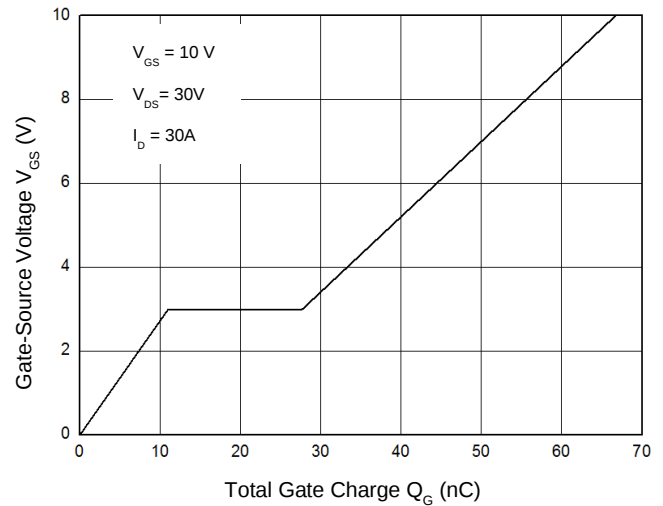


Figure 5. Body-Diode Characteristics

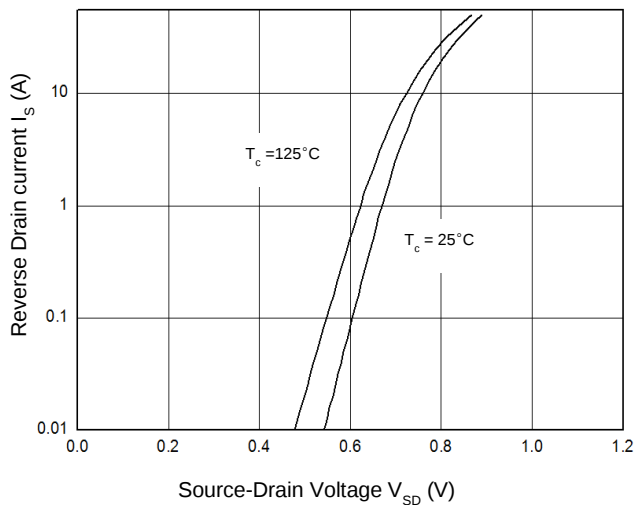


Figure 6. $R_{DS(on)}$ -Drain Current

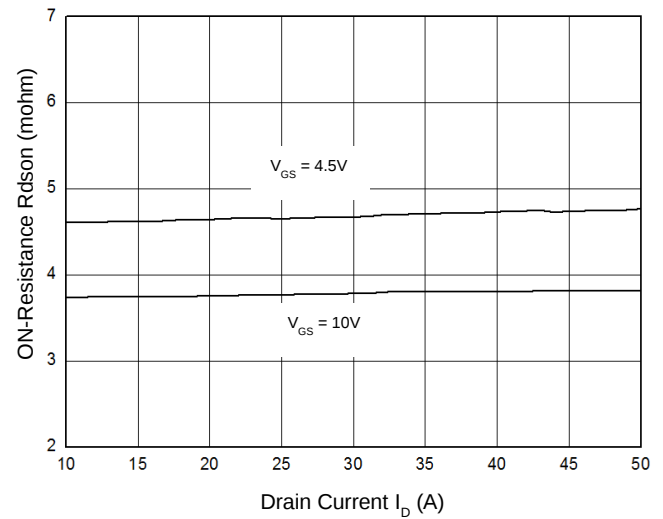


Figure 7. $R_{DS(on)}$ -Junction Temperature($^{\circ}\text{C}$)

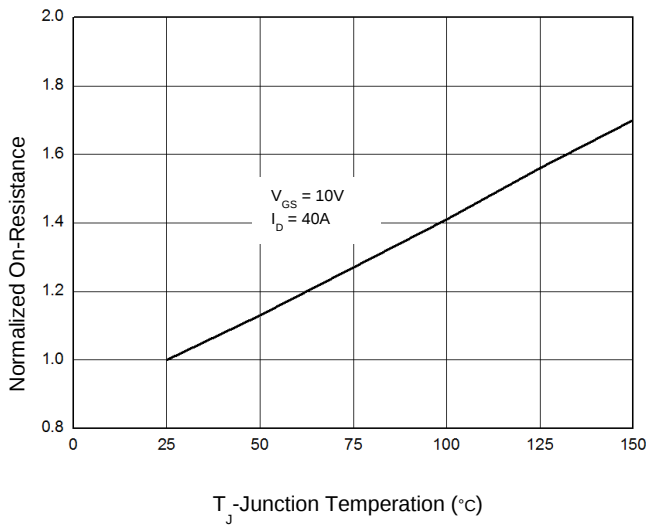


Figure 8. Maximum Safe Operating Area

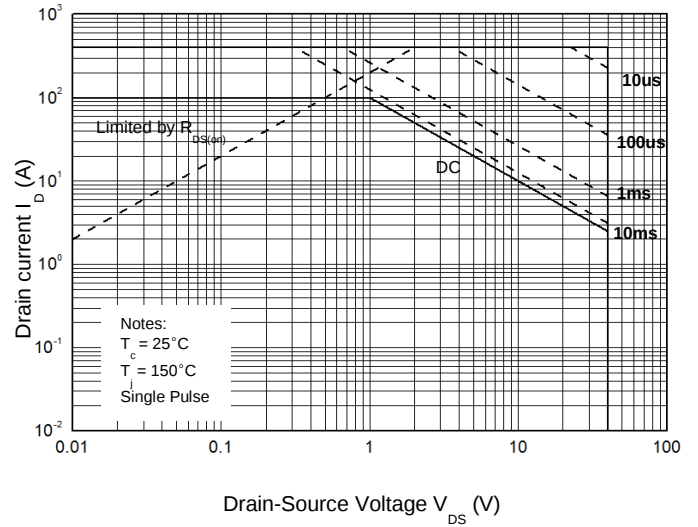
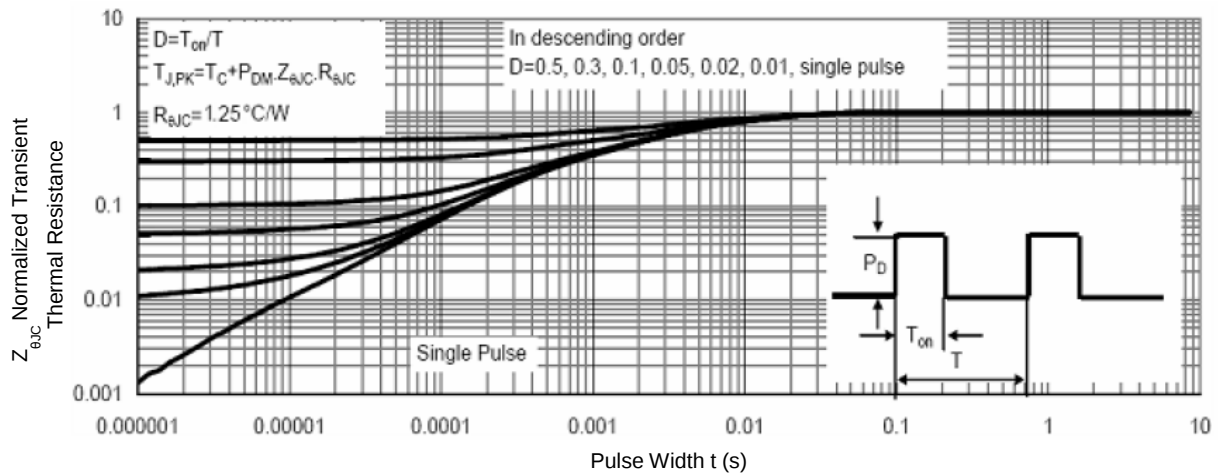


Figure 9. Normalized Maximum Transient Thermal Impedance (R_{thJC})



Test Circuit & Waveform

Figure 8. Gate Charge Test Circuit & Waveform

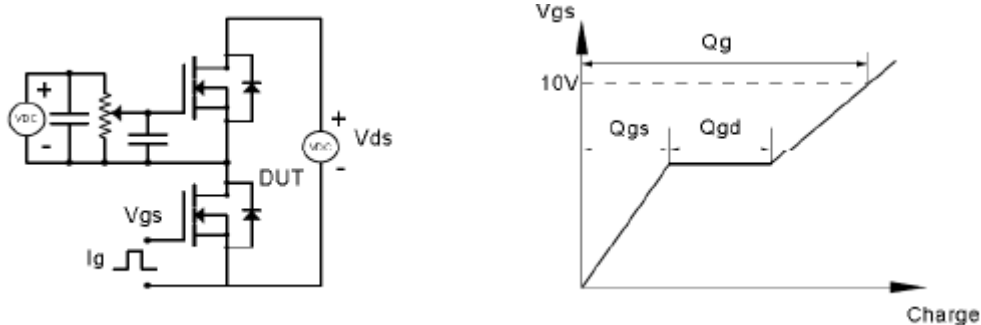


Figure 9. Resistive Switching Test Circuit & Waveforms

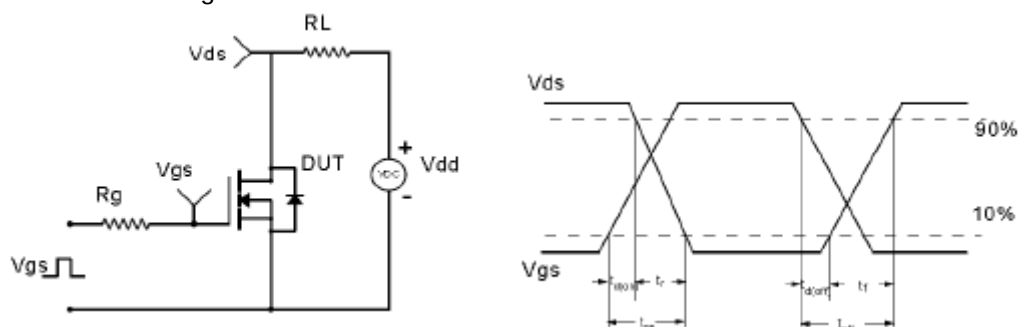


Figure 10. Unclamped Inductive Switching (UIS) Test Circuit & Waveform

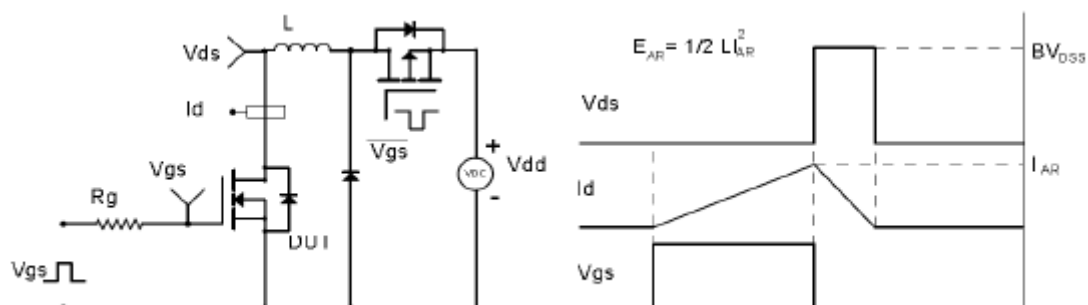
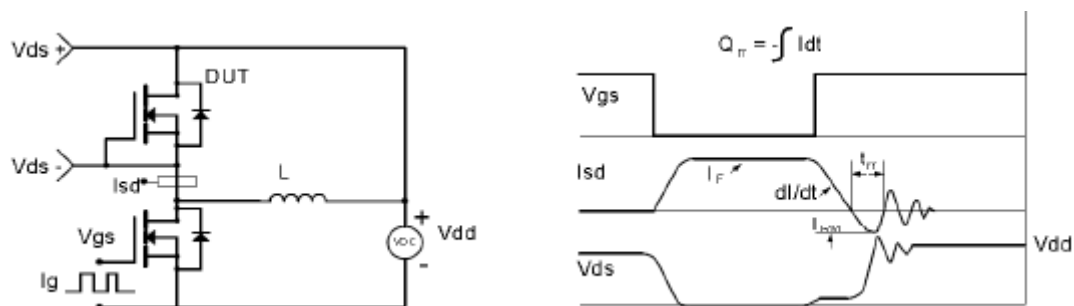
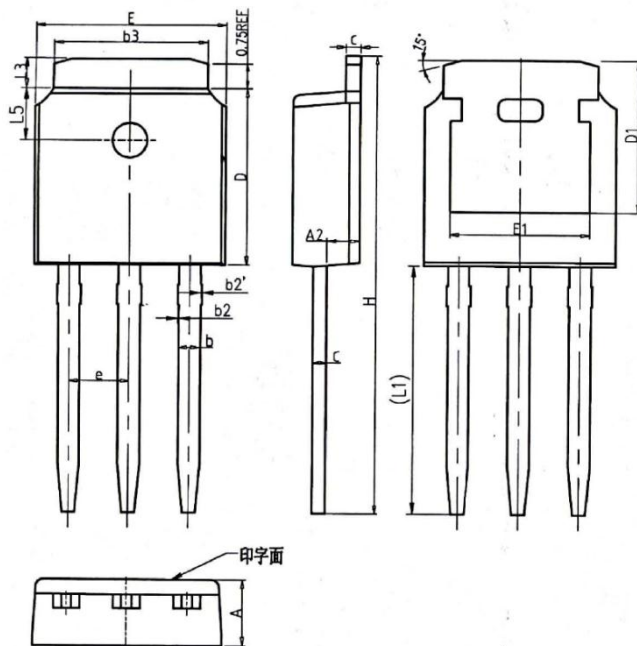


Figure 11. Diode Recovery Circuit & Waveform

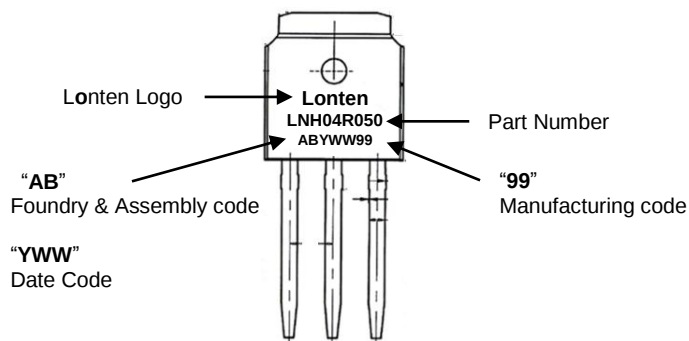


Mechanical Dimensions for TO-251

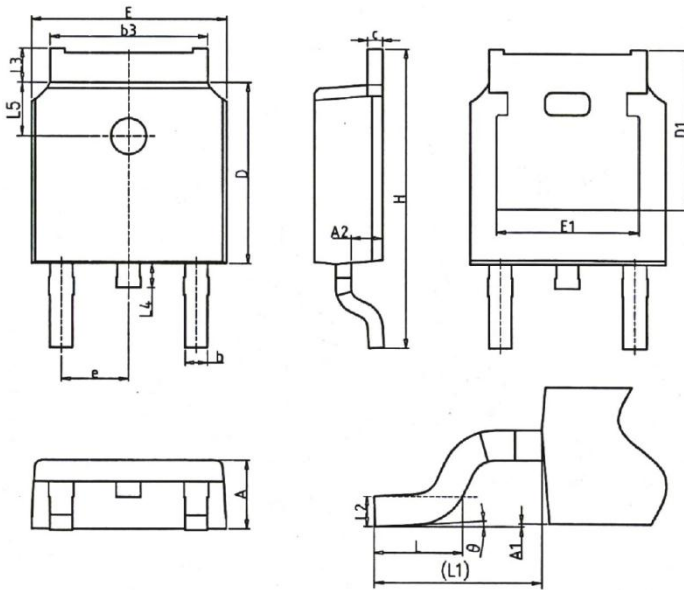


SYMBOL	COMMON DIMENSIONS					
	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX
A	2.20	2.30	2.38	0.087	0.091	0.094
A2	0.97	1.07	1.17	0.038	0.042	0.046
b	0.68	0.78	0.90	0.027	0.031	0.035
b2	0.00	0.04	0.10	0.000	0.002	0.004
b2'	0.00	0.04	0.10	0.000	0.002	0.004
b3	5.20	5.33	5.46	0.205	0.210	0.215
c	0.43	0.53	0.61	0.017	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	16.22	16.52	16.82	0.639	0.650	0.662
L1	9.15	9.40	9.65	0.360	0.370	0.380
L3	0.88	1.02	1.28	0.035	0.040	0.050
L5	1.65	1.80	1.95	0.065	0.071	0.077

TO-251 Part Marking Information

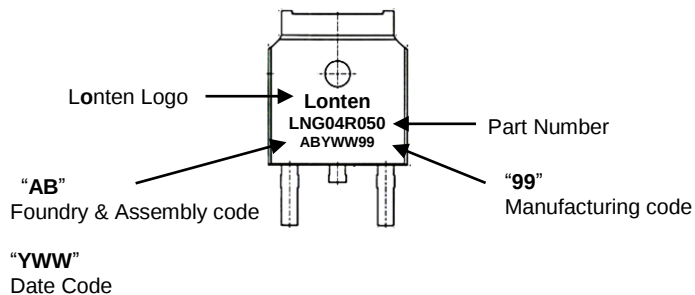


Mechanical Dimensions for TO-252



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



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