

Lonten N-channel 100V, 65A, 8.5mΩ Power MOSFET

<p>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.</p> <p>Features</p> <ul style="list-style-type: none"> ◆ 100V,65A,$R_{DS(ON),max}=8.5m\Omega@V_{GS}=10V$ ◆ Improved dv/dt capability ◆ Fast switching ◆ 100% EAS Guaranteed ◆ Green device available <p>Applications</p> <ul style="list-style-type: none"> ◆ Motor Drives ◆ UPS ◆ DC-DC Converter 	<p>Product Summary</p> <table> <tr> <td>V_{DSS}</td> <td>100V</td> </tr> <tr> <td>$R_{DS(on),max}@V_{GS}=10V$</td> <td>8.5mΩ</td> </tr> <tr> <td>I_D</td> <td>65A</td> </tr> </table> <p>Pin Configuration</p> <p>N-Channel MOSFET</p>	V_{DSS}	100V	$R_{DS(on),max}@V_{GS}=10V$	8.5mΩ	I_D	65A
V_{DSS}	100V						
$R_{DS(on),max}@V_{GS}=10V$	8.5mΩ						
I_D	65A						

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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	100	V
Continuous drain current ($T_C = 25^\circ C$) ¹⁾	I_D	65	A
Continuous drain current ($T_C = 100^\circ C$) ¹⁾		41	A
Pulsed drain current ²⁾	I_{DM}	240	A
Gate-Source voltage	V_{GSS}	± 20	V
Avalanche energy, single pulse ³⁾	E_{AS}	110	mJ
Power Dissipation ($T_C = 25^\circ C$)	P_D	96	W
Storage Temperature Range	T_{STG}	-55 to +150	$^\circ C$
Operating Junction Temperature Range	T_J	-55 to +150	$^\circ C$

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	1.3	$^\circ C/W$
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	68	$^\circ C/W$

Package Marking and Ordering Information

Device	Device Package	Marking
LSGG10R085W3	TO-252	SGG10R085W3
LSGH10R085W3	TO-251	SGH10R085W3

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	100	---	---	V
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250uA	1.4	1.8	2.2	V
Drain-source leakage current	I _{DSS}	V _{DS} =100V, V _{GS} =0V, T _J = 25°C	---	---	1	μA
		V _{DS} =80V, 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	R _{DS(on)}	V _{GS} =10 V, I _D =30 A	---	7.0	8.5	mΩ
Drain-source on-state resistance		V _{GS} =4.5 V, I _D =20 A	---	8.8	10.5	mΩ
Forward transconductance	g _{fs}	V _{DS} =5V, I _D =30A	---	112	---	S
Dynamic characteristics						
Input capacitance	C _{iss}	V _{DS} = 50 V, V _{GS} = 0 V, F = 1MHz	---	2630	---	pF
Output capacitance	C _{oss}		---	453	---	
Reverse transfer capacitance	C _{rss}		---	36	---	
Turn-on delay time	t _{d(on)}	V _{DD} = 50V, V _{GS} =10V, I _D = 30A	---	10.5	---	ns
Rise time	t _r		---	63	---	
Turn-off delay time	t _{d(off)}		---	30	---	
Fall time	t _f		---	96	---	
Gate resistance	R _g	V _{GS} =0V, V _{DS} =0V, F=1MHz	---	1.1	---	Ω
Gate charge characteristics						
Gate to source charge	Q _{gs}	V _{DS} =50 V, I _D =50A, V _{GS} = 10 V	---	10.2	---	nC
Gate to drain charge	Q _{gd}		---	6.6	---	
Gate charge total	Q _g		---	45	---	
Drain-Source diode characteristics and Maximum Ratings						
Continuous Source Current	I _S	V _G =V _D =0 V, Force Current	---	---	65	A
Pulsed Source Current	I _{SM}		---	---	240	A
Diode Forward Voltage ⁴⁾	V _{SD}	V _{GS} =0V, I _S =30A, T _J =25°C	---	0.95	1.3	V
Reverse Recovery Time	t _{rr}	I _S =30A, di/dt=100A/us, T _J =25°C	---	65	---	ns
Reverse Recovery Charge	Q _{rr}		---	104	---	nC

Notes:

- 1: The maximum junction current rating is package limited.
- 2: Repetitive Rating: Pulse width limited by maximum junction temperature.
- 3: V_{DD}=50V, V_{GS}=10V, L=0.5mH, I_{AS}=21A, R_G=25Ω, Starting T_J=25°C.
- 4: Pulse Test: Pulse Width ≤300 μ s, Duty Cycle≤2%.

Electrical Characteristics Diagrams

Figure 1. Typ. Output Characteristics

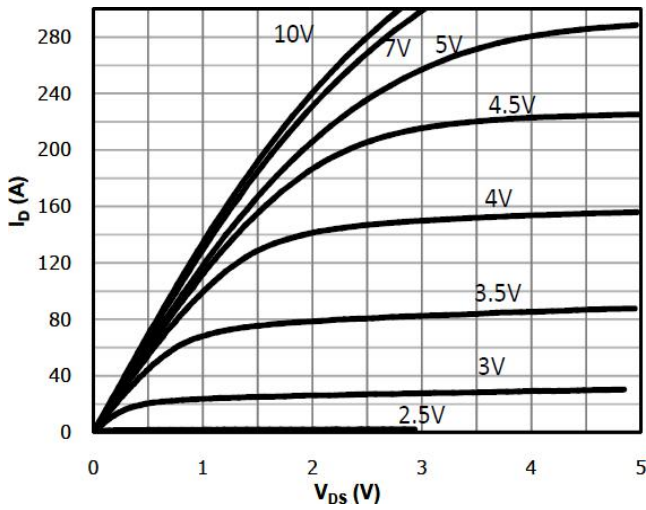


Figure 3. Capacitance Characteristics

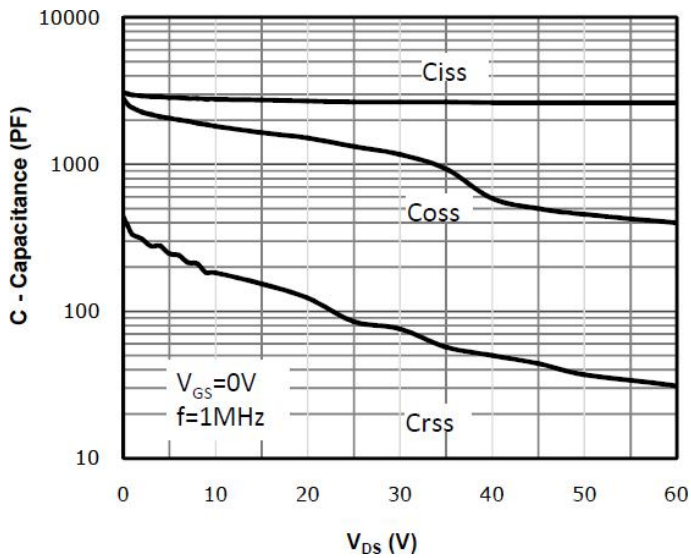


Figure 5. Body-Diode Characteristics

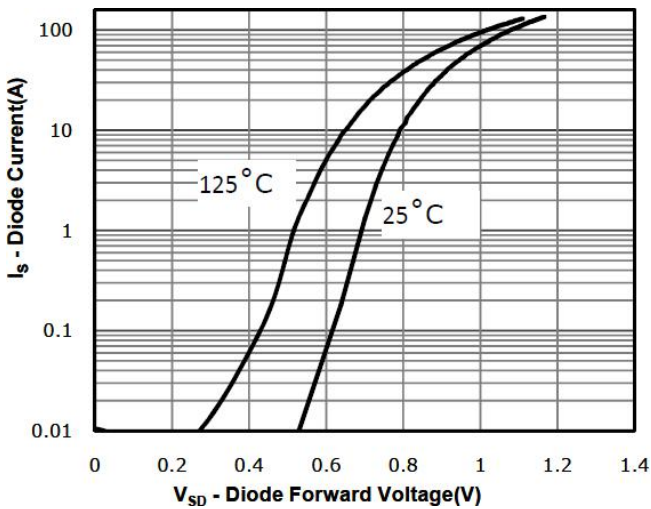


Figure 2. Transfer Characteristics

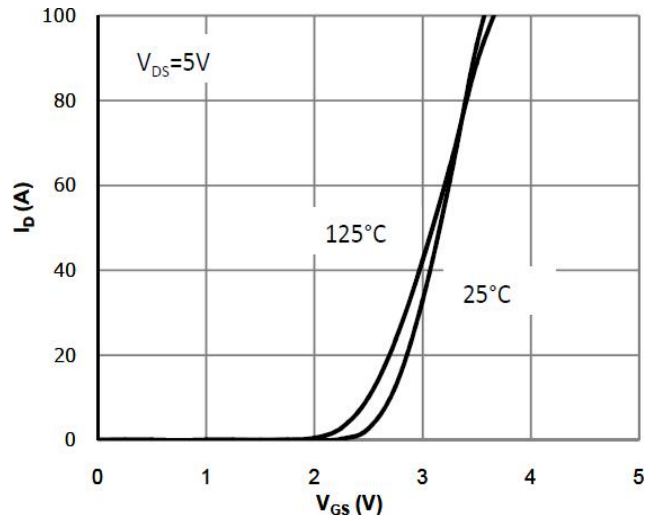


Figure 4. Gate Charge Waveform

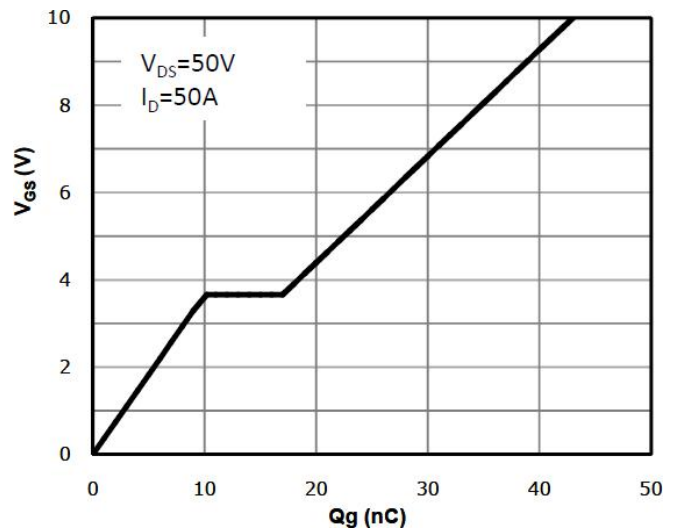


Figure 6. Rds(on)-Drain Current

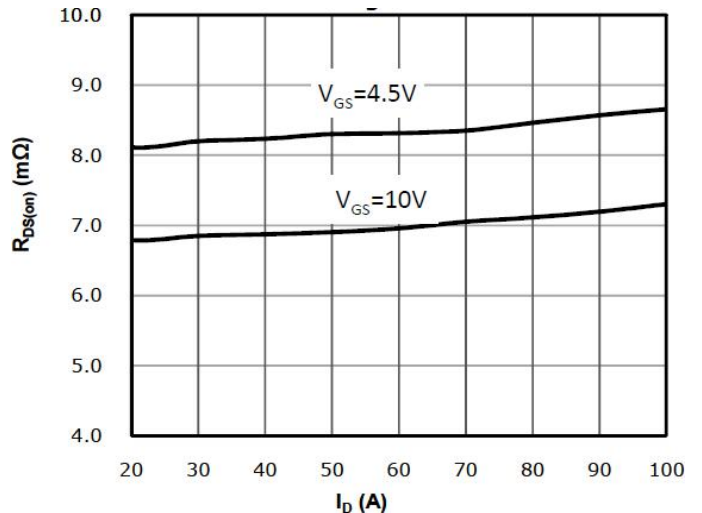


Figure 7. R_{DS(on)}-Junction Temperature(°C)

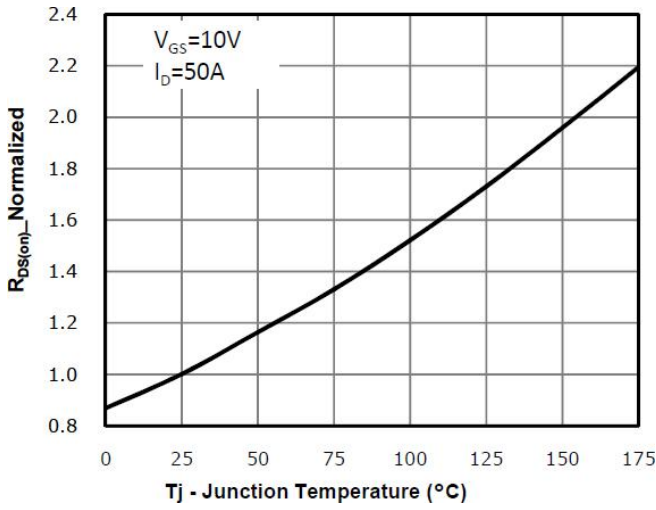


Figure 8. Maximum Safe Operating Area

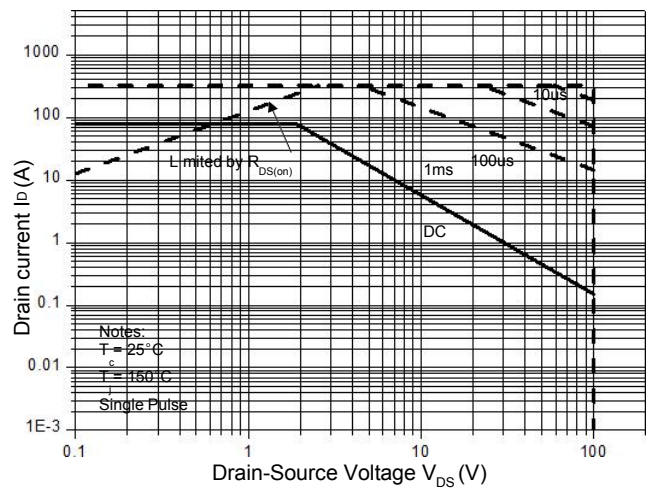
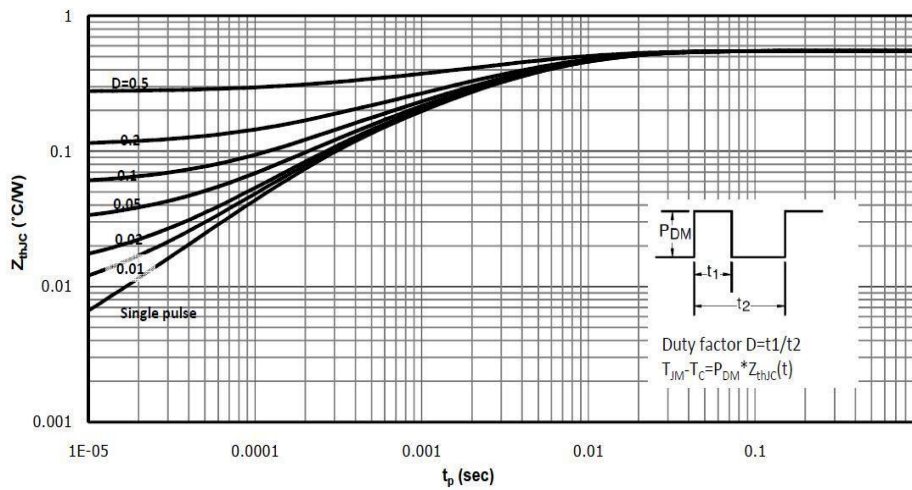


Figure 9. Normalized Maximum Transient Thermal Impedance (R_{thJC})



Test Circuit & Waveform

Figure 8. Gate Charge Test Circuit & Waveform

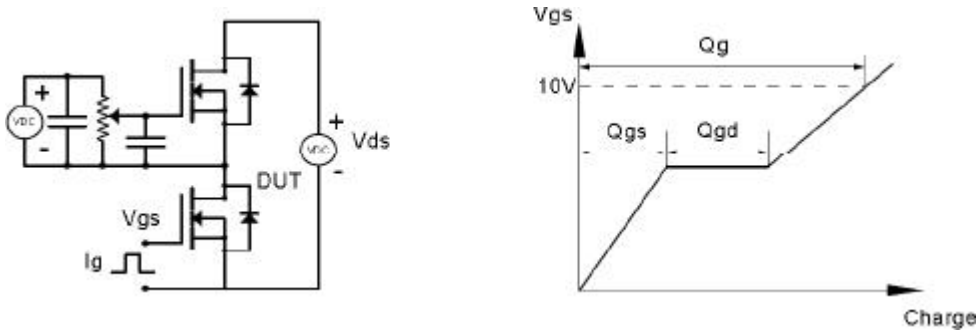


Figure 9. Resistive Switching Test Circuit & Waveforms

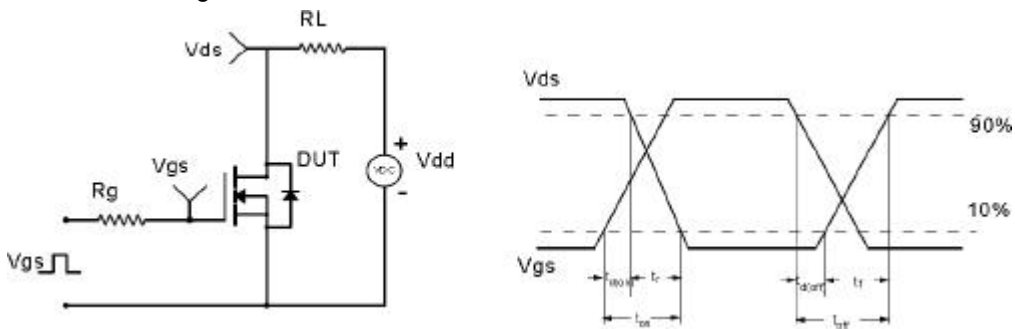


Figure 10. Unclamped Inductive Switching (UIS) Test Circuit & Waveform

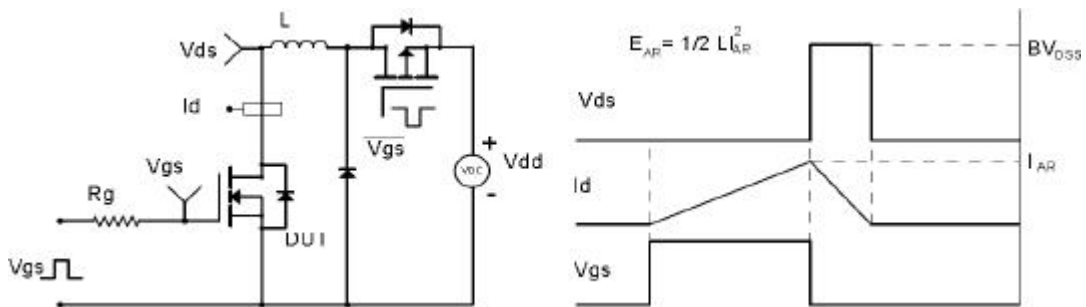
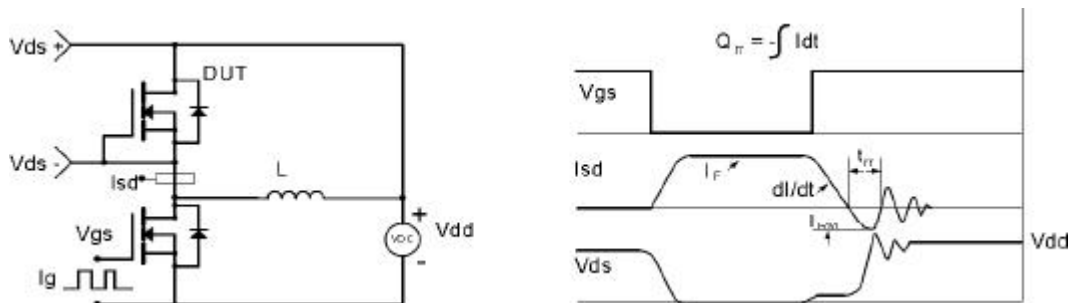
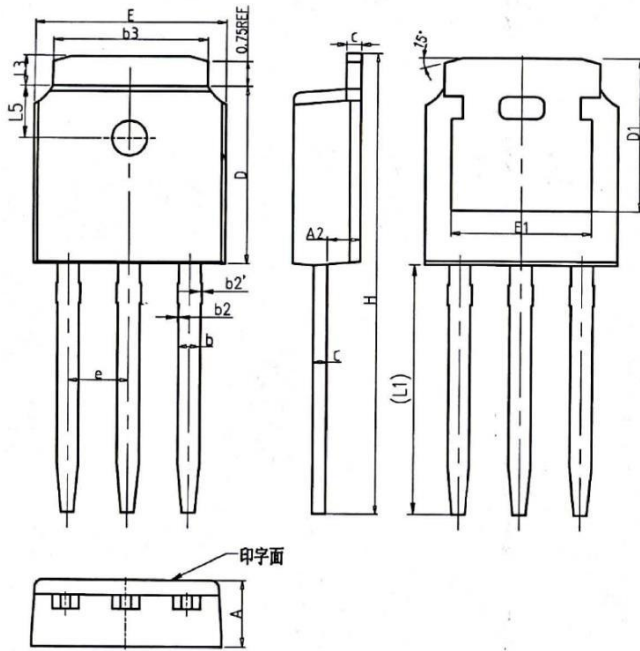


Figure 11. Diode Recovery Circuit & Waveform

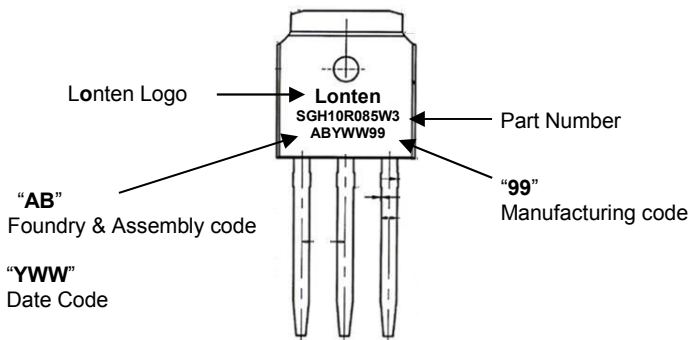


Mechanical Dimensions for TO-251

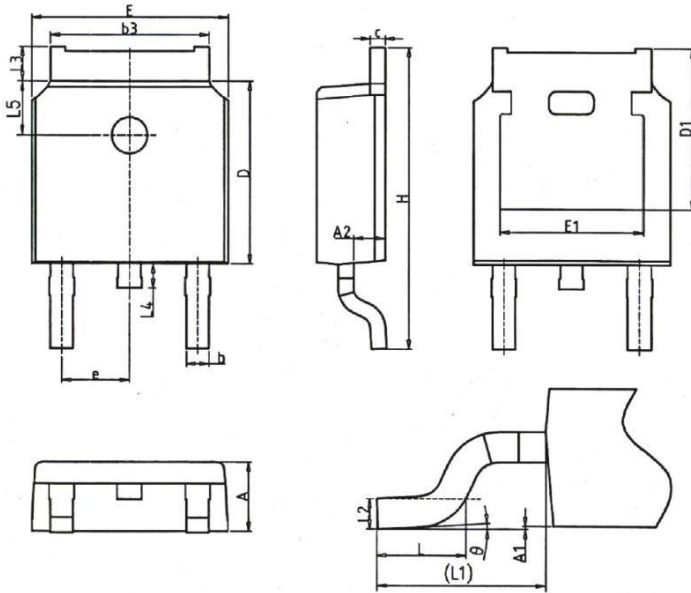


COMMON DIMENSIONS						
SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX
A	2.20	2.30	2.38	0.087	0.091	0.094
A2	0.97	1.07	1.17	0.038	0.042	0.046
b	0.68	0.78	0.90	0.027	0.031	0.035
b2	0.00	0.04	0.10	0.000	0.002	0.004
b2'	0.00	0.04	0.10	0.000	0.002	0.004
b3	5.20	5.33	5.46	0.205	0.210	0.215
c	0.43	0.53	0.61	0.017	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

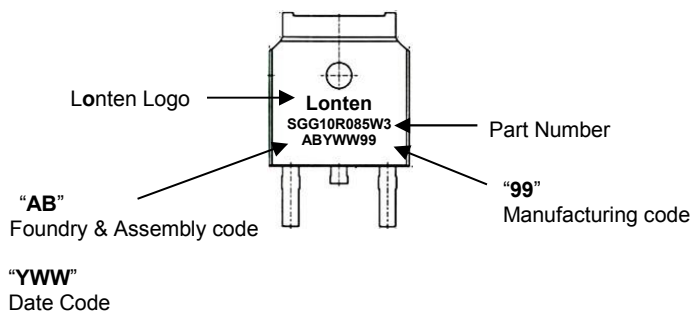


Mechanical Dimensions for TO-252



SYMBOL	COMMON DIMENSIONS					
	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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