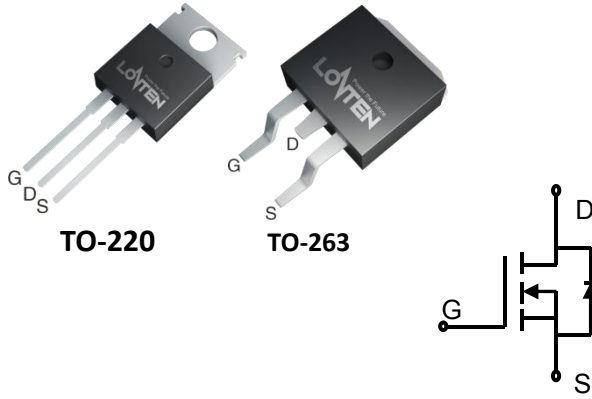


Lonten N-channel 70V, 85A, 8.5mΩ Power MOSFET

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 ◆ 70V, 85A, $R_{DS(ON).max}=8.5m\Omega@V_{GS}=10V$ ◆ 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>70V</td></tr> <tr> <td>$R_{DS(on).max}@V_{GS}=10V$</td><td>8.5mΩ</td></tr> <tr> <td>I_D</td><td>85A</td></tr> </table> Pin Configuration  TO-220 TO-263 N-Channel MOSFET	V_{DSS}	70V	$R_{DS(on).max}@V_{GS}=10V$	8.5mΩ	I_D	85A
V_{DSS}	70V						
$R_{DS(on).max}@V_{GS}=10V$	8.5mΩ						
I_D	85A						

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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	70	V
Continuous drain current ($T_C = 25^\circ\text{C}$)	I_D	85	A
Continuous drain current ($T_C = 100^\circ\text{C}$)		55	A
Pulsed drain current ¹⁾	I_{DM}	340	A
Gate-Source voltage	V_{GSS}	± 20	V
Avalanche energy ²⁾	E_{AS}	144	mJ
Power Dissipation ($T_C = 25^\circ\text{C}$)	P_D	125	W
Storage Temperature Range	T_{STG}	-55 to +150	$^\circ\text{C}$
sOperating Junction Temperature Range	T_J	-55 to +150	$^\circ\text{C}$

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	1.0	$^\circ\text{C/W}$

Package Marking and Ordering Information

Device	Device Package	Marking
LNC07R085H	TO-220	LNC07R085H
LNE07R085H	TO-263	LNE07R085H

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	70	---	---	V
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250uA	2.0	3.0	4.0	V
Drain-source leakage current	I _{DSS}	V _{DS} =70V, V _{GS} =0V, T _J = 25°C	---	---	1	μA
		V _{DS} =56V, V _{GS} =0V, T _J = 125°C	---	---	30	μA
Gate leakage current, Forward	I _{GSSF}	V _{GS} =20V, V _{DS} =0 V	---	---	100	nA
Gate leakage current, Reverse	I _{GSSR}	V _{GS} =-20V, V _{DS} =0 V	---	---	-100	nA
Drain-source on-state resistance	R _{DS(on)}	V _{GS} =10V, I _D =30A	---	7.2	8.5	mΩ
Forward transconductance	g _{fs}	V _{DS} =5V, I _D =30A	---	63	---	S
Dynamic characteristics						
Input capacitance	C _{iss}	V _{DS} = 25V, V _{GS} = 0V, F = 1MHz	---	3570	---	pF
Output capacitance	C _{oss}		---	248	---	
Reverse transfer capacitance	C _{rss}		---	197	---	
Turn-on delay time	t _{d(on)}	V _{DD} = 30V,V _{GS} =10V, I _D =30A	---	17.8	---	ns
Rise time	t _r		---	27.6	---	
Turn-off delay time	t _{d(off)}		---	102	---	
Fall time	t _f		---	28.6	---	
Gate resistance	R _g	V _{GS} =0V, V _{DS} =0V, F=1MHz	---	3.25	---	Ω
Gate charge characteristics						
Gate to source charge	Q _{gs}	V _{DS} =30V, I _D =30A, V _{GS} = 10V	---	21.2	---	nC
Gate to drain charge	Q _{gd}		---	17.9	---	
Gate charge total	Q _g		---	65.4	---	
Drain-Source diode characteristics and Maximum Ratings						
Continuous Source Current	I _S		---	---	85	A
Pulsed Source Current ³⁾	I _{SM}		---	---	340	A
Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =30A, T _J =25°C	---	---	1.2	V
Reverse Recovery Time	t _{rr}	I _S =25A,di/dt=100A/us, T _J =25°C	---	28.4	---	ns
Reverse Recovery Charge	Q _{rr}		---	21.3	---	nC

Notes:

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

2: $V_{DD}=35\text{V}, V_{GS}=10\text{V}, L=0.5\text{mH}, I_{AS}=24\text{A}, R_G=25\Omega$, 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

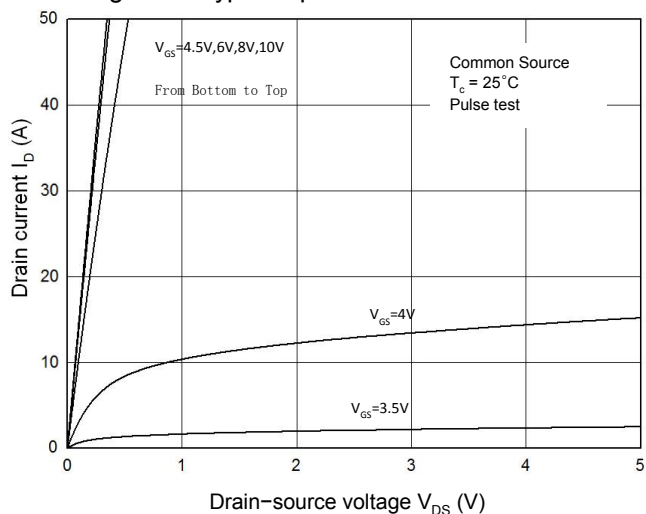


Figure 2. Transfer Characteristics

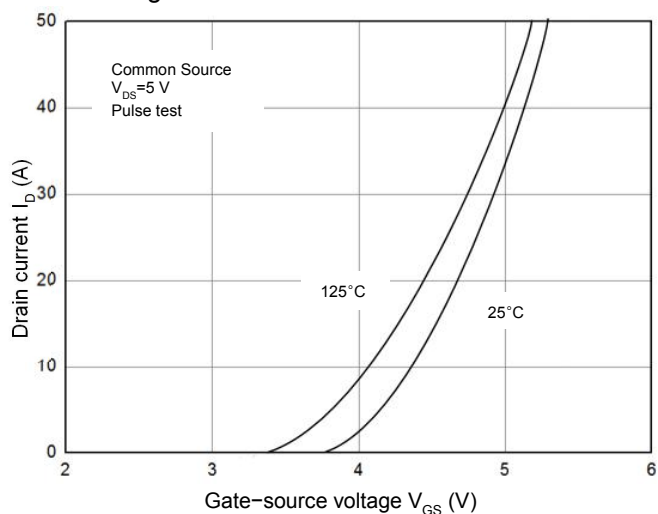


Figure 3. Capacitance Characteristics

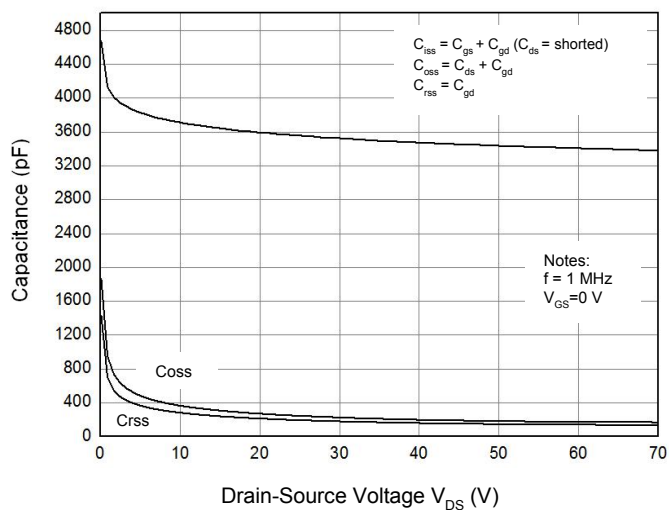


Figure 4. Gate Charge Waveform

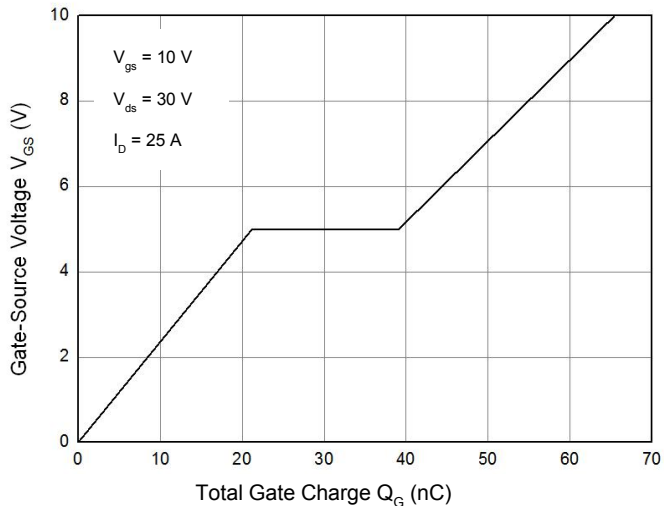


Figure 5. Body-Diode Characteristics

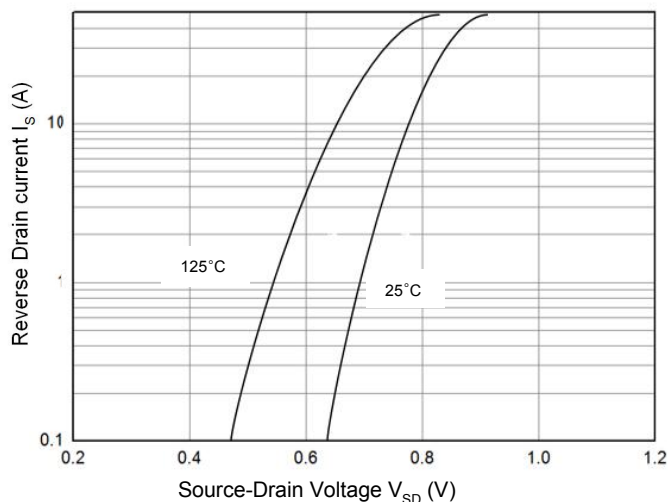


Figure 6. Rdson-Drain Current

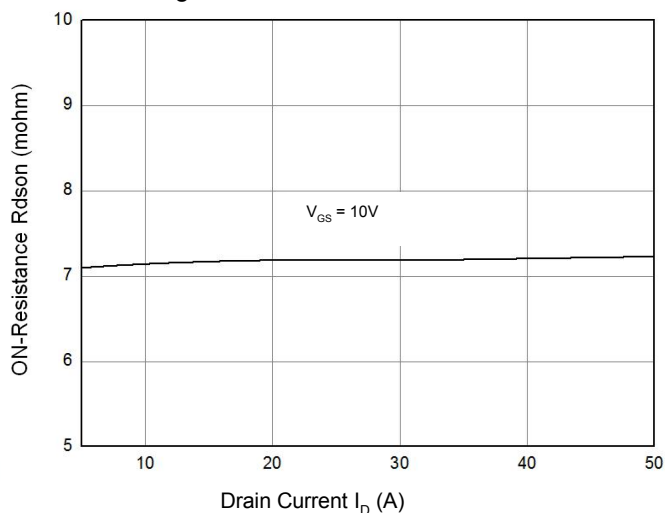


Figure 7. $R_{DS(on)}$ -Junction Temperature($^{\circ}\text{C}$)

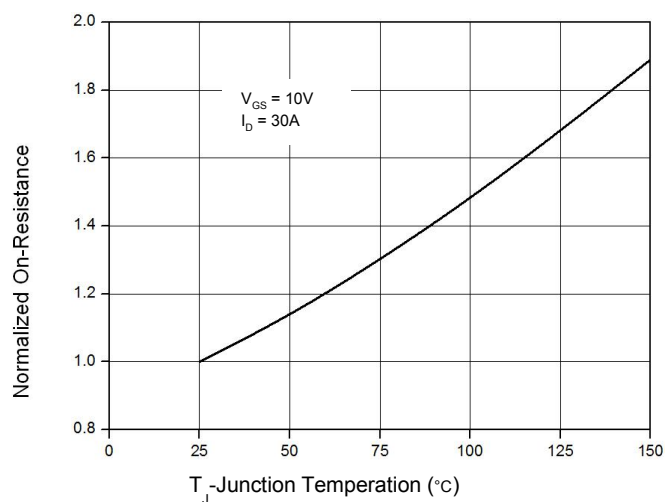


Figure 8. Maximum Safe Operating Area

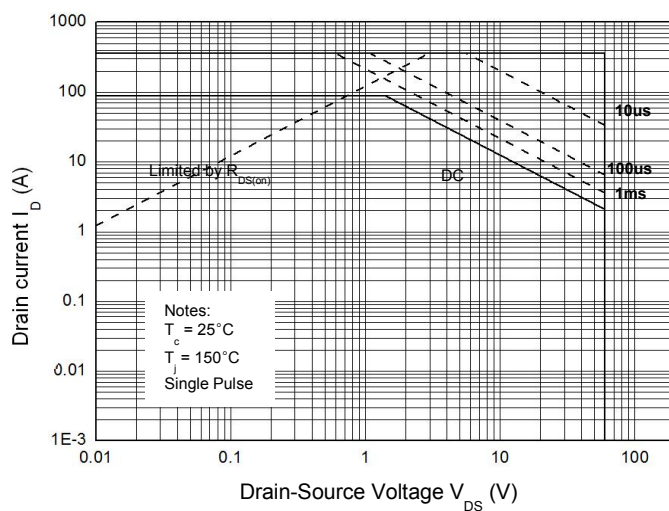
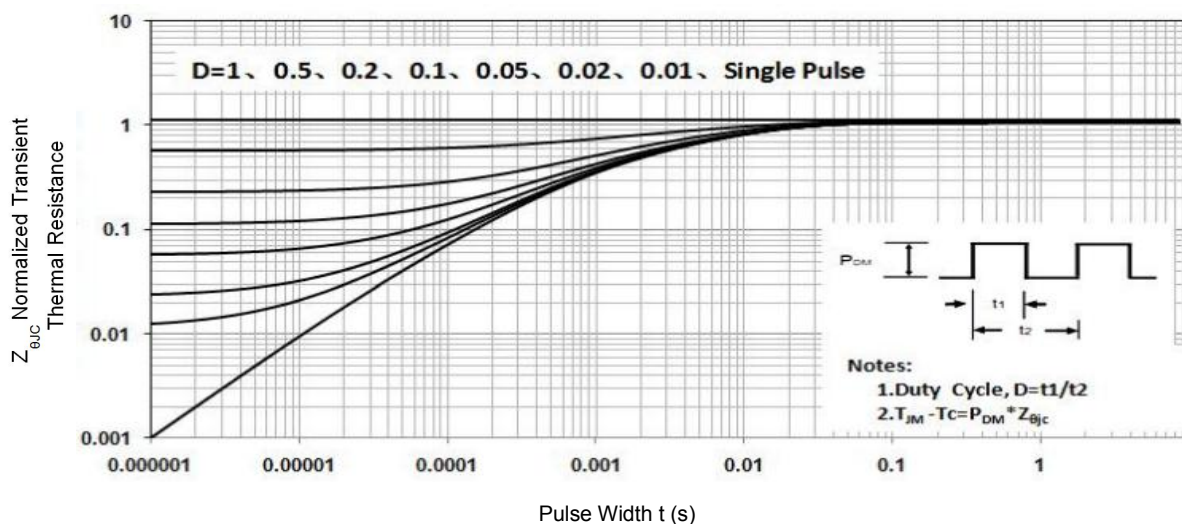


Figure 9. Normalized Maximum Transient Thermal Impedance (R_{thJC})



Test Circuit & Waveform

Figure 8. Gate Charge Test Circuit & Waveform

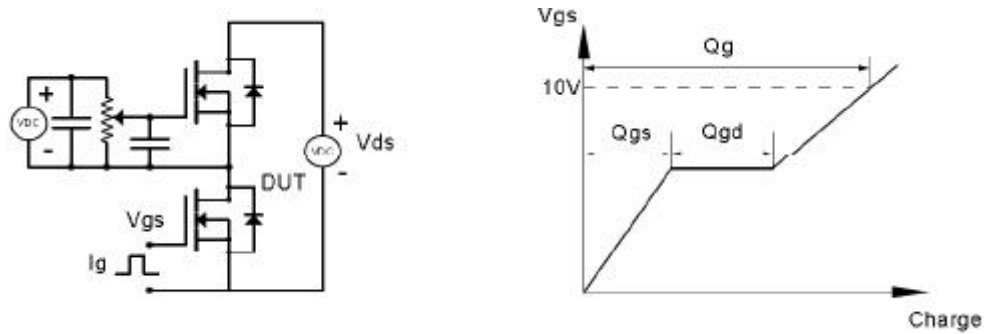


Figure 9. Resistive Switching Test Circuit & Waveforms

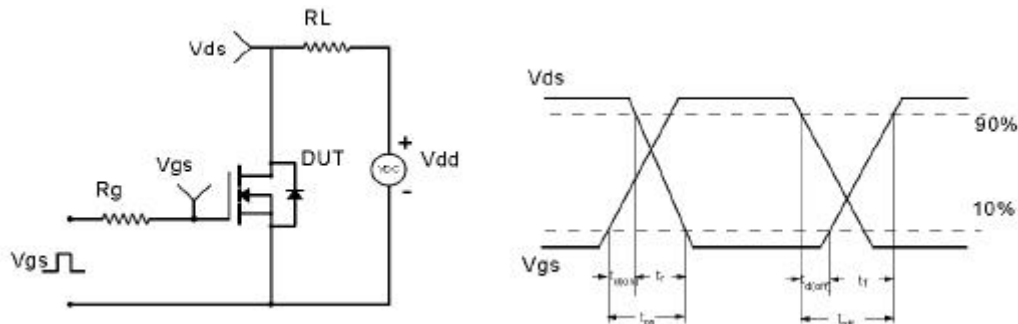


Figure 10. Unclamped Inductive Switching (UIS) Test Circuit & Waveform

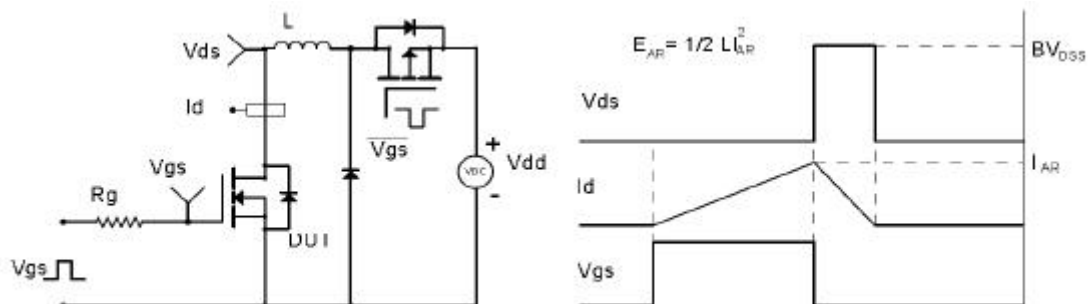
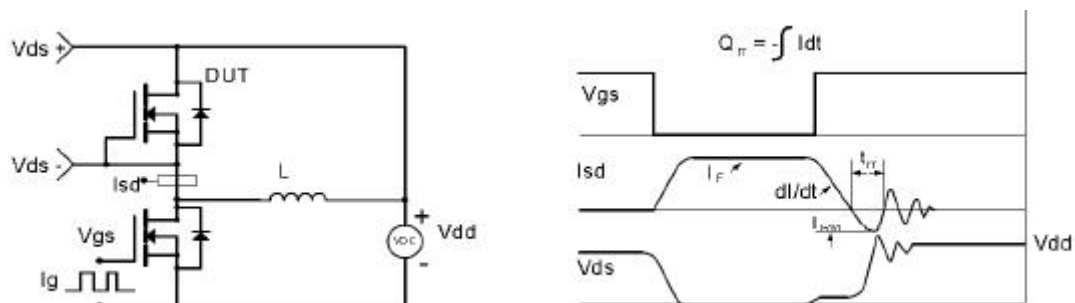
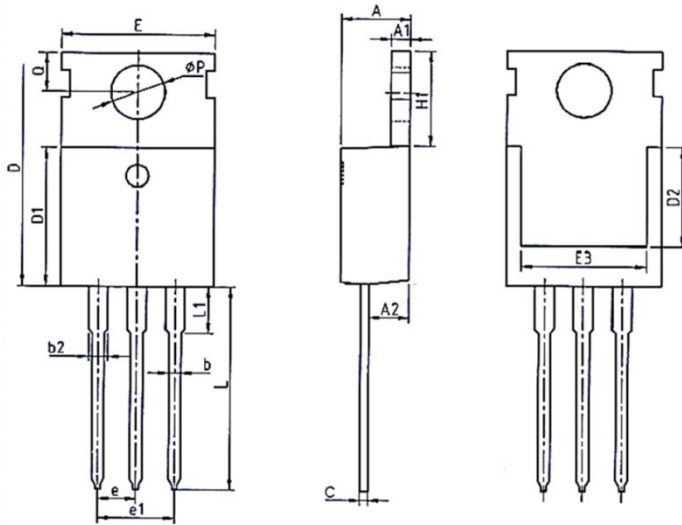


Figure 11. Diode Recovery Circuit & Waveform

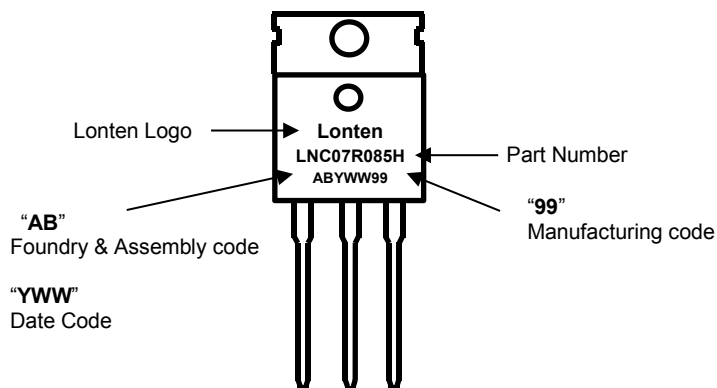


TO-220 PACKAGE INFORMATION

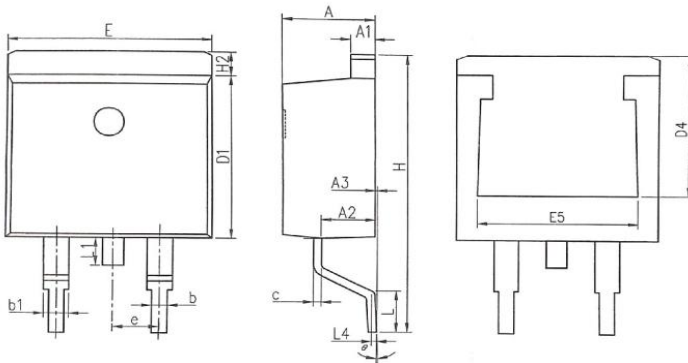


SYMBOL	COMMON DIMENSIONS					
	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX
A	4.37	4.57	4.70	0.172	0.180	0.185
A1	1.25	1.30	1.40	0.049	0.051	0.055
A2	2.20	2.40	2.60	0.087	0.094	0.102
b	0.70	0.80	0.95	0.028	0.031	0.037
b2	1.17	1.27	1.47	0.046	0.050	0.058
c	0.45	0.50	0.60	0.018	0.020	0.024
D	15.10	15.60	16.10	0.594	0.614	0.634
D1	8.80	9.10	9.40	0.346	0.358	0.370
D2	5.50	-	-	0.217	-	-
E	9.70	10.00	10.30	0.382	0.394	0.406
E3	7.00	-	-	0.276	-	-
e	2.54BCS			0.1BSC		
e1	5.08BCS			0.2REF		
H1	6.25	6.50	6.85	0.246	0.256	0.270
L	12.75	13.50	13.80	0.502	0.531	0.543
L1	-	3.10	3.40	-	0.122	0.134
ØP	3.40	3.60	3.80	0.134	0.142	0.150
Q	2.60	2.80	3.00	0.102	0.110	0.118

TO-220 Part Marking Information

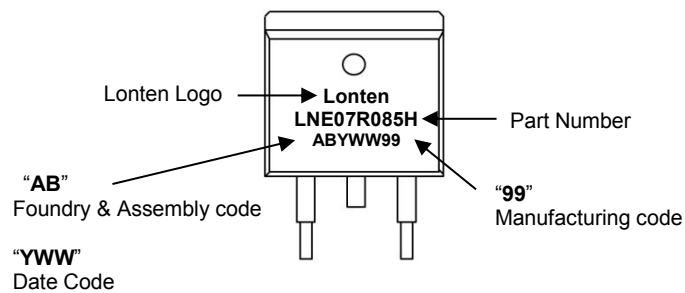


TO-263 PACKAGE INFORMATION



COMMON DIMENSIONS						
SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX
A	4.37	4.57	4.77	0.172	0.180	0.188
A1	1.22	1.27	1.42	0.048	0.050	0.056
A2	2.49	2.69	2.89	0.098	0.106	0.114
A3	0.00	0.13	0.25	0.000	0.005	0.010
b	0.70	0.81	0.96	0.028	0.032	0.038
b1	1.17	1.27	1.47	0.046	0.050	0.058
c	0.30	0.38	0.53	0.012	0.015	0.021
D1	8.50	8.70	8.90	0.335	0.343	0.350
D4	6.60	—	—	0.260	—	—
E	9.86	10.16	10.36	0.388	0.400	0.408
E5	7.06	—	—	0.278	—	—
e	2.54 BSC			0.100 BSC		
H	14.70	15.10	15.50	0.579	0.594	0.610
H2	1.07	1.27	1.47	0.042	0.050	0.058
L	2.00	2.30	2.60	0.079	0.091	0.102
L1	1.40	1.55	1.70	0.055	0.061	0.067
L4	0.25 BSC			0.010 BSC		
θ	0°	5°	9°	0°	5°	9°

TO-263 Part Marking Information



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