Lonten N-channel 85 V, 80A, 6.5mΩ Power MOSFET

Features

- Extremely low on-resistance $R_{DS(on)}$
- Excellent $Q_g x R_{DS(on)}$ product(FOM)
- Qualified according to JEDEC criteria

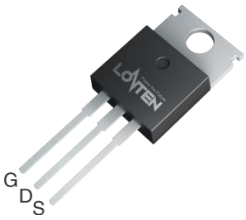
Product Summary

V_{DS}	85V
$R_{DS(on)}$	6.5mΩ
I_D	80A

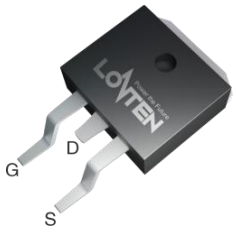
Applications

- Motor control and drive
- Battery management
- UPS (Uninterrupible Power Supplies)

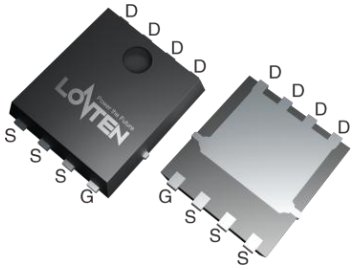
100% Avalanche Tested



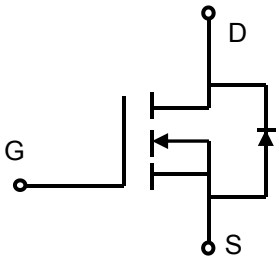
TO-220



TO-263



DFN5×6



Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DS}	85	V
Continuous drain current T_C = 25°C (Silicon limit) T_C = 25°C (Package limit) T_C = 100°C (Silicon limit)	I_D	 114 80 72	A
Pulsed drain current (T_C = 25°C, t_p limited by T_{jmax})	$I_{D\ pulse}$	320	A
Avalanche energy, single pulse (L=0.5mH, Rg=25Ω)	$E_{AS(Note\ 1)}$	272	mJ
Gate-Source voltage	V_{GS}	±20	V
Power dissipation (T_C = 25°C)	P_{tot}	138	W
Operating junction and storage temperature	T_j , T_{stg}	-55...+150	°C

※. Notes:1.EAS is tested at starting Tj = 25℃, L = 0.5mH, IAS = 35A, VGS = 10V. EAS(max)=1089mJ under IAS(max)=66A and above Conditions;

Thermal Resistance

Parameter	Symbol	Max	Unit
Thermal resistance, junction – case.	R_{thJC}	0.90	°C/W
Thermal resistance, junction – ambient(min. footprint)	R_{thJA}	80	

Package Marking and Ordering Information

Device	Device Package	Marking
LSGC085R065W3	TO-220	LSGC085R065W3
LSGE085R065W3	TO-263	SGE085R065W3
LSGN085R065W3	DFN5×6	SG085R065W3

Electrical Characteristic (at Tj = 25 °C, unless otherwise specified)

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Static Characteristic						
Drain-source breakdown voltage	BV_{DSS}	85	99	-	V	V_{GS}=0V, I_D=250uA
Gate threshold voltage	$V_{GS(th)}$	2	3	4	V	V_{DS}=V_{GS},I_D=250uA
Zero gate voltage drain current	I_{DSS}	- -	0.02 -	1 10	μA	V_{DS}=85V,V_{GS}=0V T_j=25°C T_j=125°C
Gate-source leakage current	I_{GSS}	-	10	100	nA	V_{GS}=20V,V_{DS}=0V
Drain-source on-state resistance	$R_{DS(on)}$	-	5.7	6.5	mΩ	V_{GS}=10V, I_D=50A TO-220
Transconductance	g_{fs}	-	68	-	S	V_{DS}=5V,I_D=40A
Dynamic Characteristic						
Input Capacitance	C_{iss}	-	3190	-	pF	V_{GS}=0V, V_{DS}=42.5V, f=1MHz
Output Capacitance	C_{oss}	-	601	-		
Reverse Transfer Capacitance	C_{rss}	-	28	-		
Gate Total Charge	Q_G	-	55	-	nC	V_{GS}=10V, V_{DS}=42.5V, I_D=30A, f=1MHz
Gate-Source charge	Q_{gs}	-	17	-		
Gate-Drain charge	Q_{gd}	-	14	-		
Turn-on delay time	$t_{d(on)}$	-	22	-	ns	Vds=42.5V Id=30A Rg=5Ω Vgs=10V; (Note 2,3)
Rise time	t_r	-	30	-		
Turn-off delay time	$t_{d(off)}$	-	84	-		
Fall time	t_f	-	32	-		
Gate resistance	R_G	-	2.5	-	Ω	V_{GS}=0V, V_{DS}=0V, f=1MHz

Body Diode Characteristic

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Body Diode Forward Voltage	V_{SD}	-	0.9	1.4	V	V_{GS}=0V,I_{SD}=50A
Body Diode Reverse Recovery Time	t_{rr}	-	78	-	ns	IS=30A, VGS=0V, dIF/dt=100A/us;
Body Diode Reverse Recovery Charge	Q_{rr}	-	44	-	nC	

※. Notes

2.Pulse Test : Pulse Width ≤ 300us, duty cycle ≤ 2%.

3.Essentially independent of operating temperature.

Typical Performance Characteristics

Fig 1: Output Characteristics

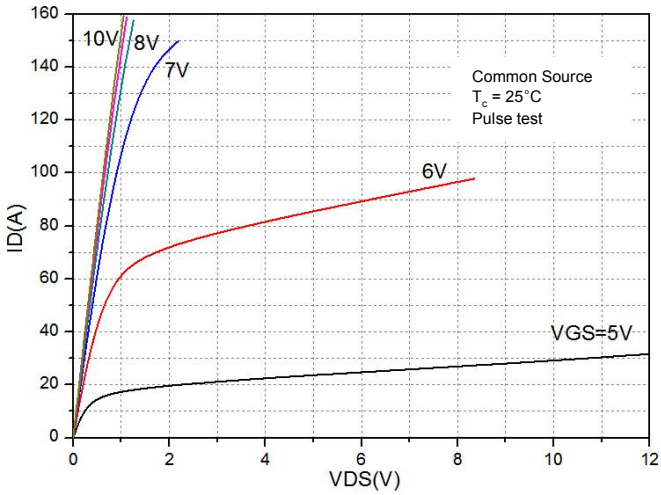


Fig 2: Transfer Characteristics

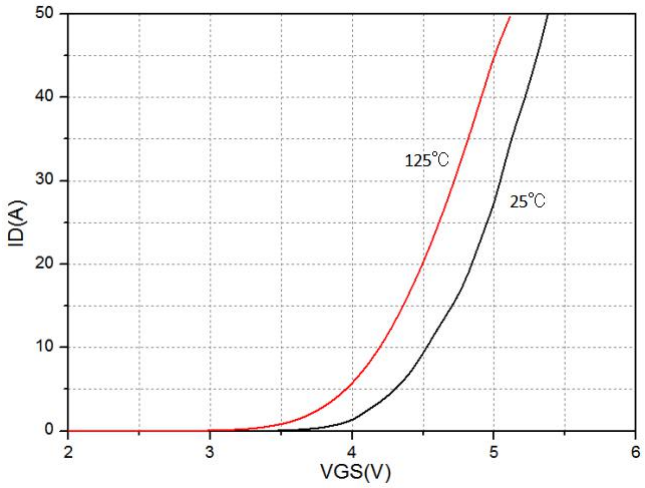


Figure 3. Capacitance Characteristics

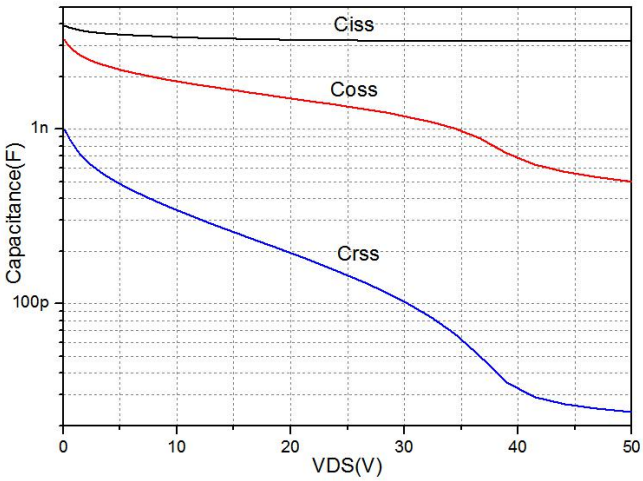


Figure 4. Gate Charge Waveform

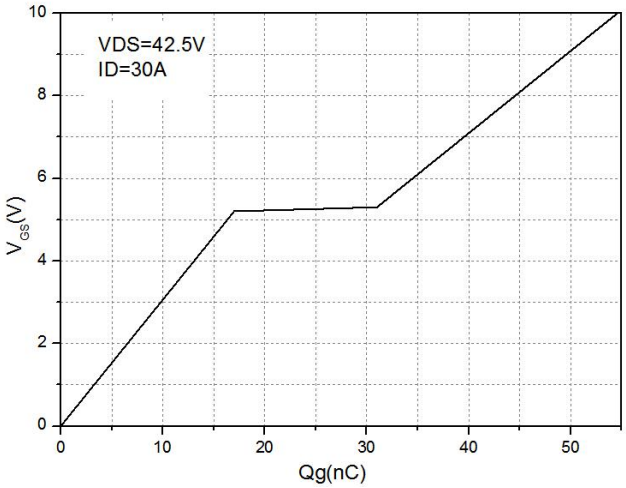


Figure 5. Body-Diode Characteristics

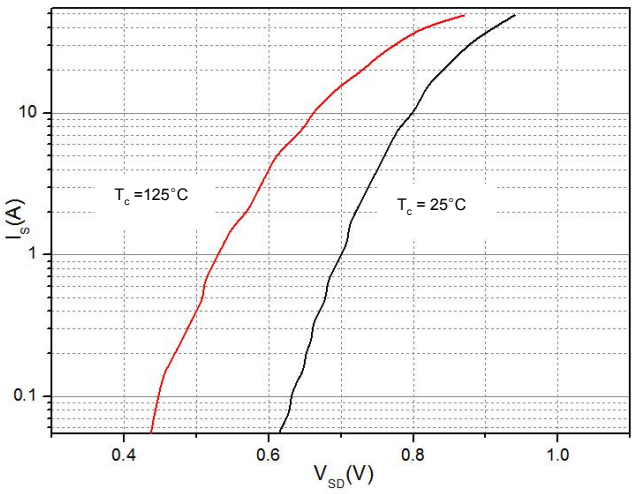


Figure 6. Rdson-Drain Current

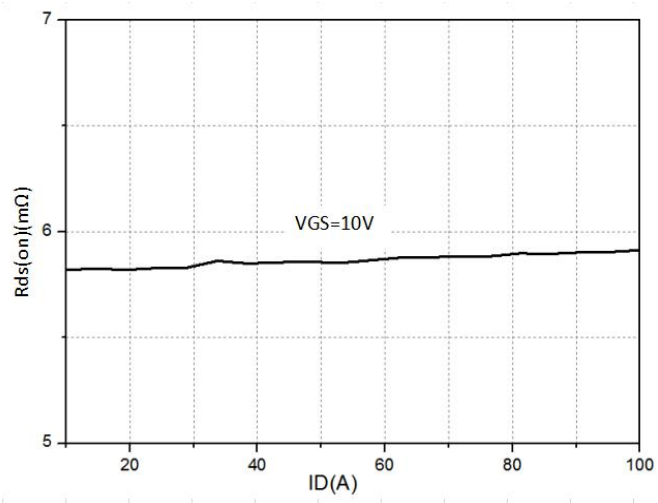


Fig 7: Rds(on) vs Gate Voltage

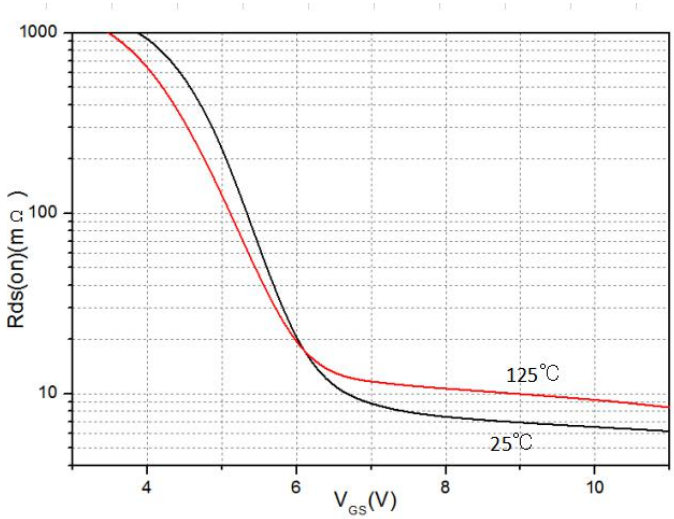


Fig 8: Rdson-Junction Temperature(℃)

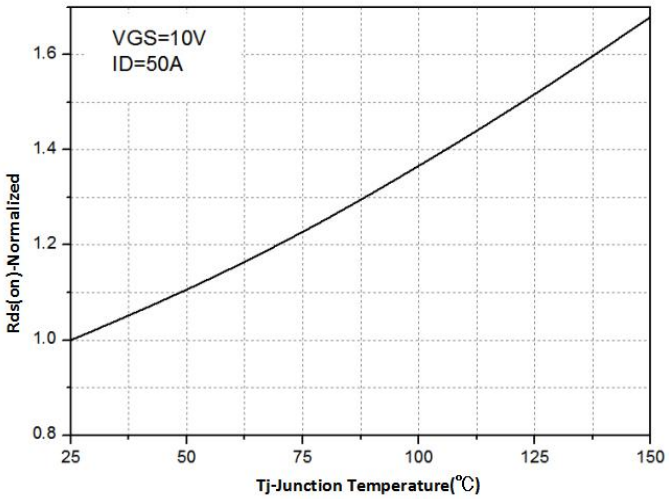


Figure 9. Maximum Safe Operating Area

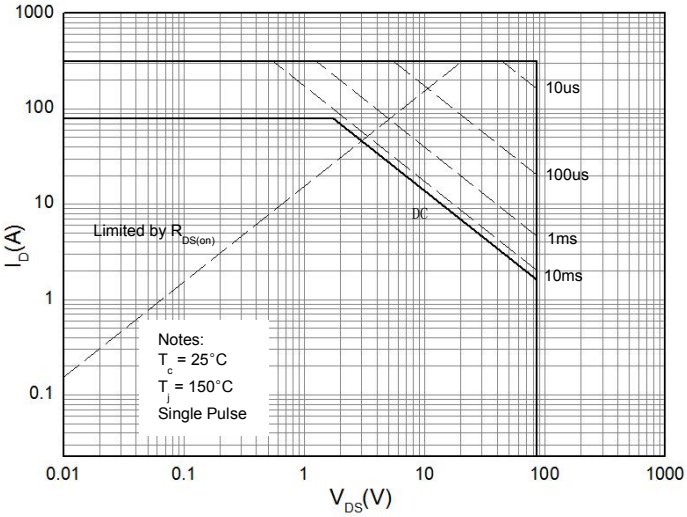
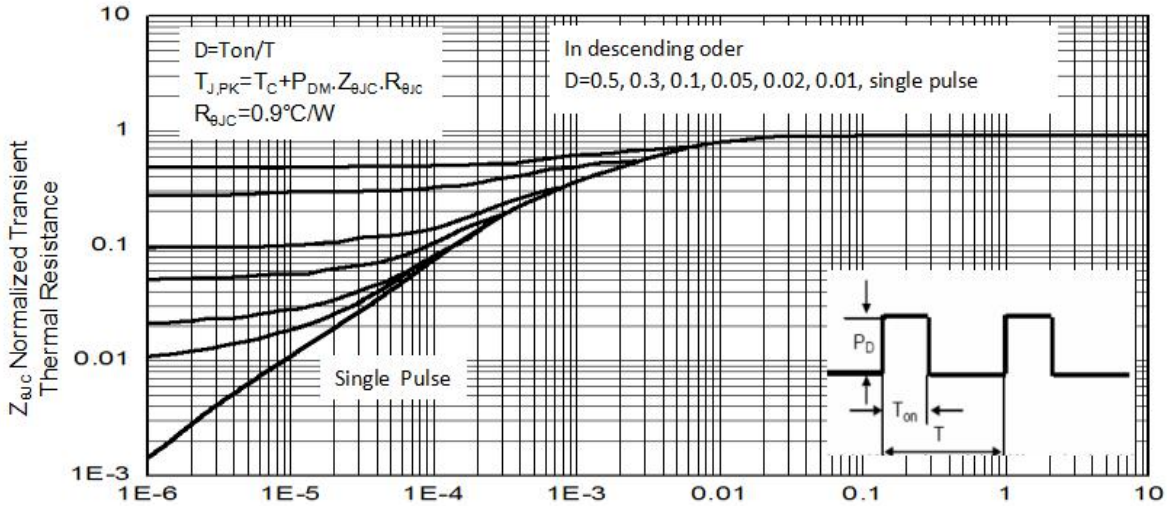
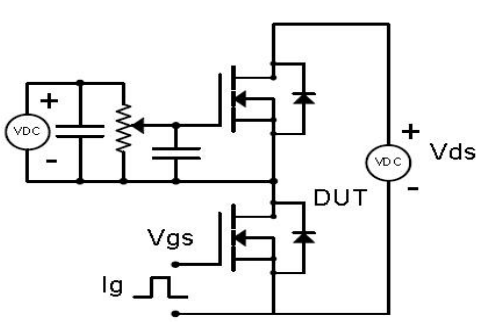


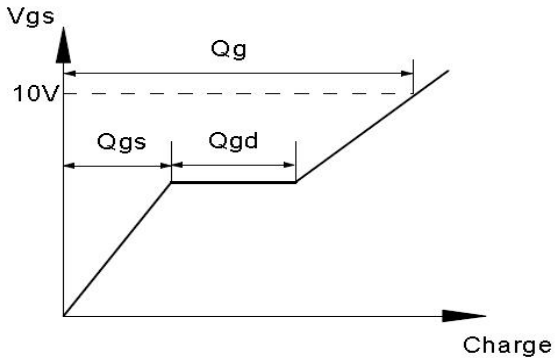
Figure 10. Normalized Maximum Transient Thermal Impedance (RthJC)



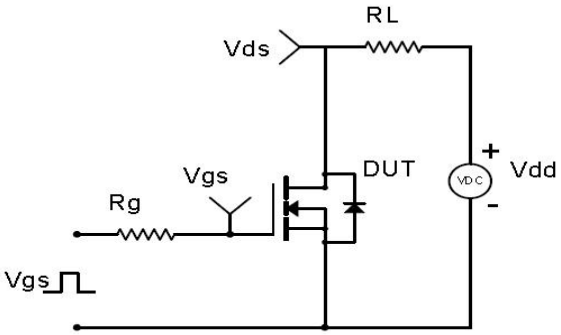
Test Circuit & Waveform

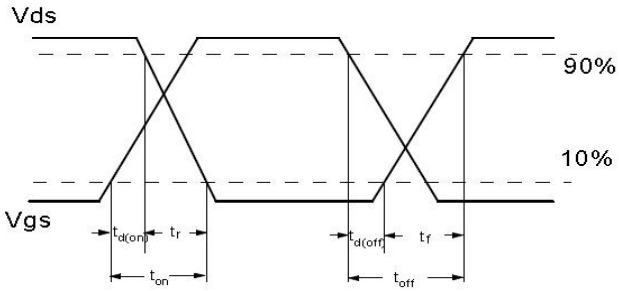
Gate Charge Test Circuit & Waveform



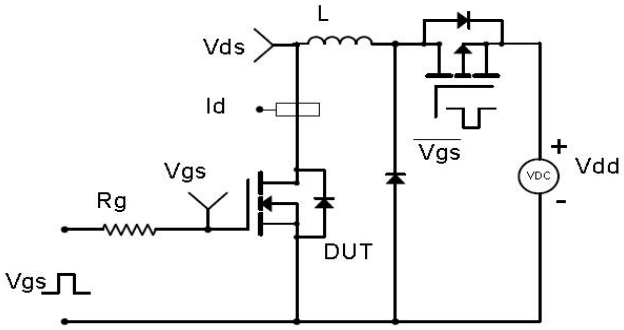


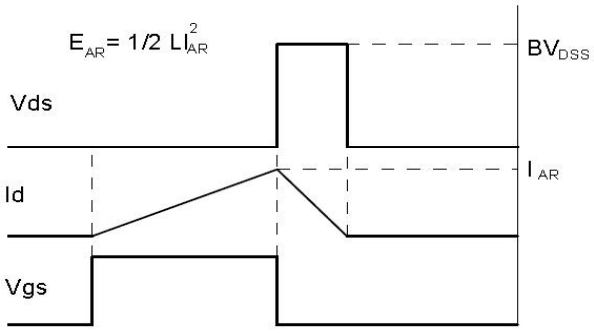
Resistive Switching Test Circuit & Waveforms



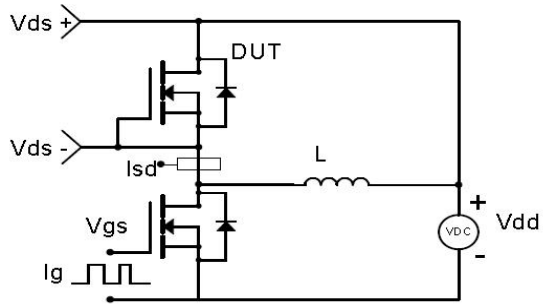


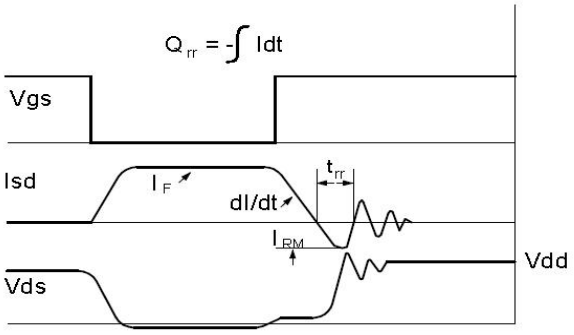
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



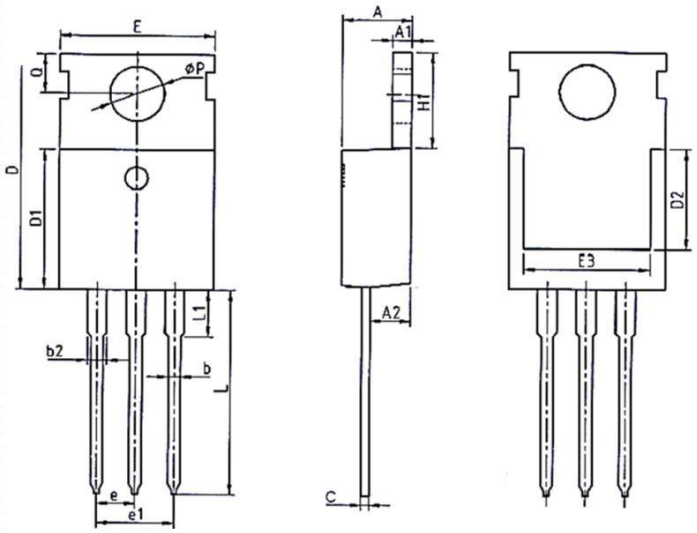


Diode Recovery Test Circuit & Waveforms



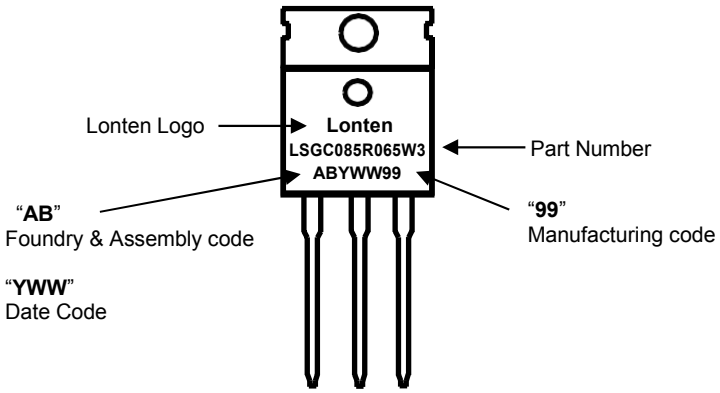


Mechanical Dimensions for TO-220



COMMON DIMENSIONS						
SYMBOL	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



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2020	I	Workweek 03	03
2021	J	Workweek 04	04
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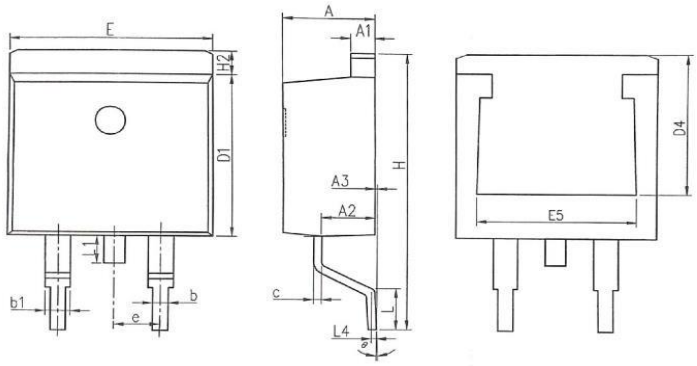
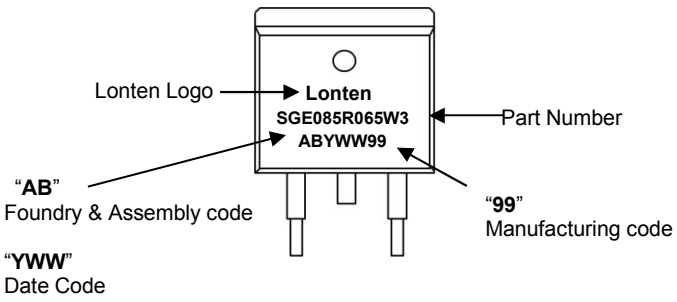
Mechanical Dimensions for TO-263



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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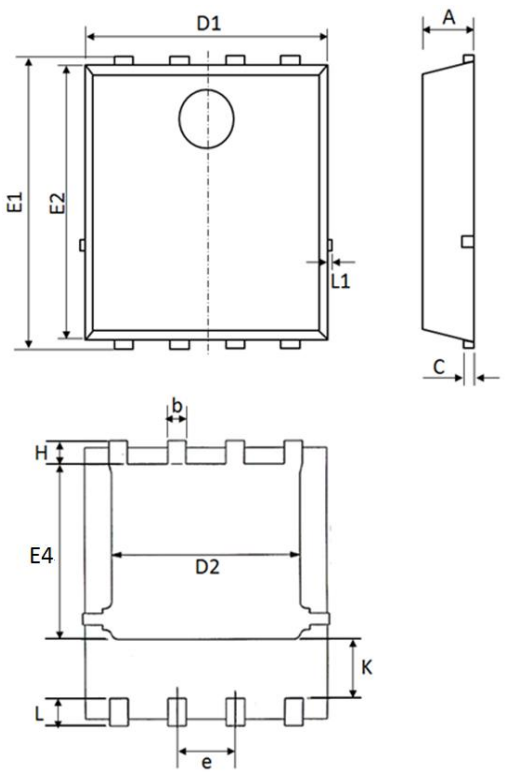
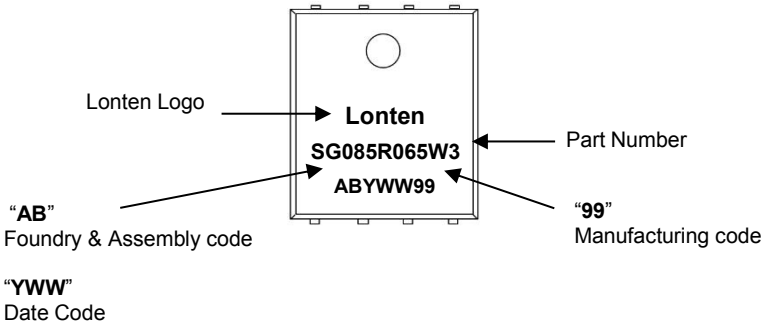
Mechanical Dimensions for DFN5×6



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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2024	M	…..	…..

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