

## 20A 45V SchottkyBarrierDiode

### 1 Description

This center tap Schottky rectifier has been optimized for low reverse leakage at high temperature. The proprietary barrier technology allows for reliable operation up to 150°C junction temperature.

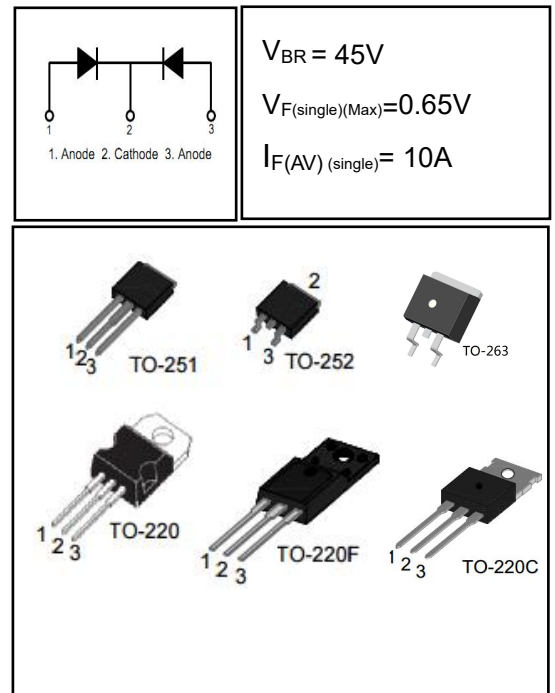
TO-220F provides insulation voltage rated at 2000V RMS from all three terminals to external heatsink.

### 2 Features

- High junction temperature capability
- Low leakage current
- Low thermal resistance
- High frequency operation

### 3 Applications

- converters
- free-wheeling diodes
- reverse battery protection
- Typical applications are in switching power



## 4 Electrical Characteristics

### 4.1 Absolute Maximum Ratings (Tc=25°C, unless otherwise noted)

PARAMETER		SYMBOL	VALUE	UNIT
Peak Repetitive Reverse Voltage		$V_{RRM}$	45	V
RMS Reverse Voltage		$V_{R(RMS)}$	31	V
DC Blocking Voltage		$V_R$	45	V
Average Rectified Forward Current(single)	TO-220F, Tc=90°C	$I_{F(AV)}$	10	A
Average Rectified Forward Current(double)	TO-220/263/252/251, Tc=120°C		20	A
Repetitive Peak Surge Current(single)		$I_{FRM}$	15	A
Nonrepetitive Peak Surge Current(single)	t=8.3ms	$I_{FSM}$	150	A
Reverse Surge Current (Note 1)		$I_{RSM}$	5	A
Operating Junction Temperature Range		$T_j$	-55~150	°C
Storage Temperature Range		$T_{stg}$	-55~150	°C
ESD (Machine Model=C)			>400	V
ESD (Human Body Model=3B)			>8000	V
ESD(Noncontact)			>15000	V

### 4.2 Thermal Characteristics

PARAMETER	SYMBOL	VALUE			UNIT
		TO-220	TO-220F	TO-252/251	
Thermal Resistance, Junction to Case-sink	$R_{thJC}$	2.0	4.5	4.0	°C/W

## 4.3 Electrical Characteristics (T<sub>c</sub>=25°C, unless otherwise noted)

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Maximum Instantaneous Forward Voltage(Note 3)	V <sub>F</sub>	I <sub>F</sub> = 10A	-	0.59	0.65	V
		I <sub>F</sub> = 10A, T <sub>C</sub> = 125°C	-	-	0.55	V
		I <sub>F</sub> = 20A	-	0.79	0.95	V
Maximum Instantaneous Reverse (Note 2)	I <sub>R</sub>	V <sub>R</sub> = 45V	-	25	100	uA
		V <sub>R</sub> = 45V, T <sub>C</sub> = 125°C	-	-	20	mA
Total capacitance	C <sub>tot</sub>	V <sub>R</sub> =4V f=1MHz	-	310	-	pF
DC Blocking Voltage	V <sub>BR</sub>	I <sub>R</sub> =100uA	45	59	-	V

Notes:

- 2.0us Pulse Width, f=1.0 KHz
- Pulse Test: 300us Pulse Width, 1% Duty Cycle
- V<sub>F</sub> Instantaneous forward voltage (pw = 300μs, D = 2%).

## 5 Typical characteristics diagrams

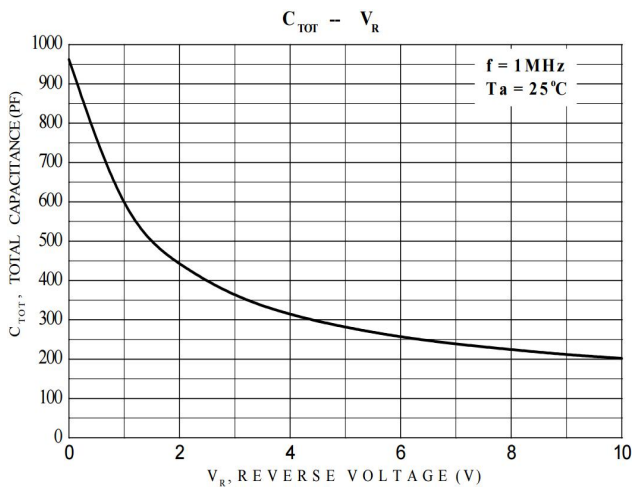


FIGURE 1. Total capacitance vs Voltage

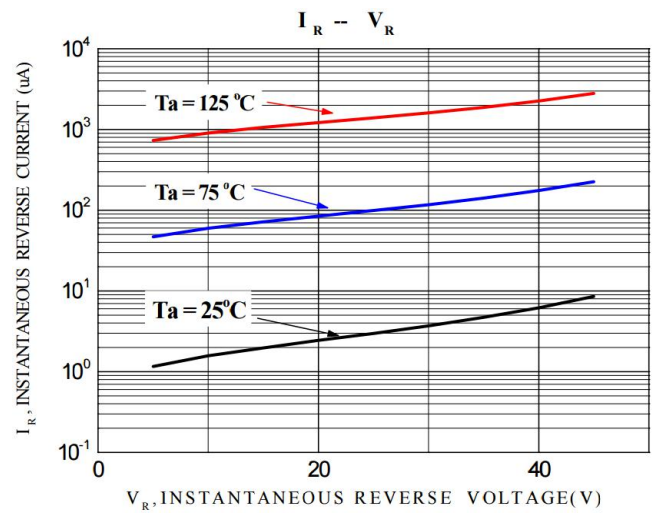


FIGURE 2. REVERSE CURRENT vs REVERSE VOLTAGE

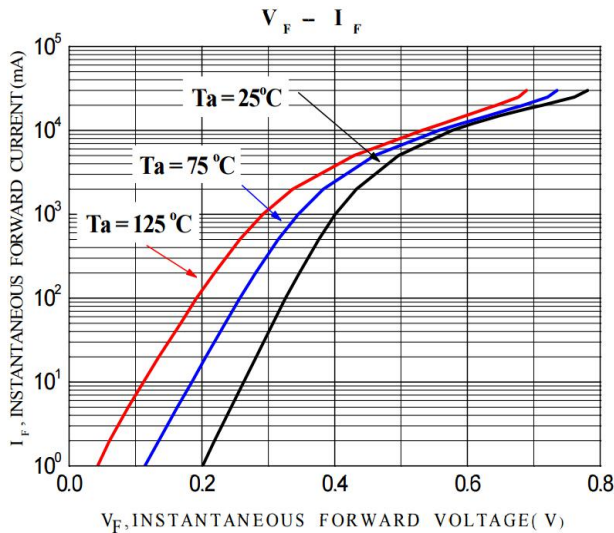
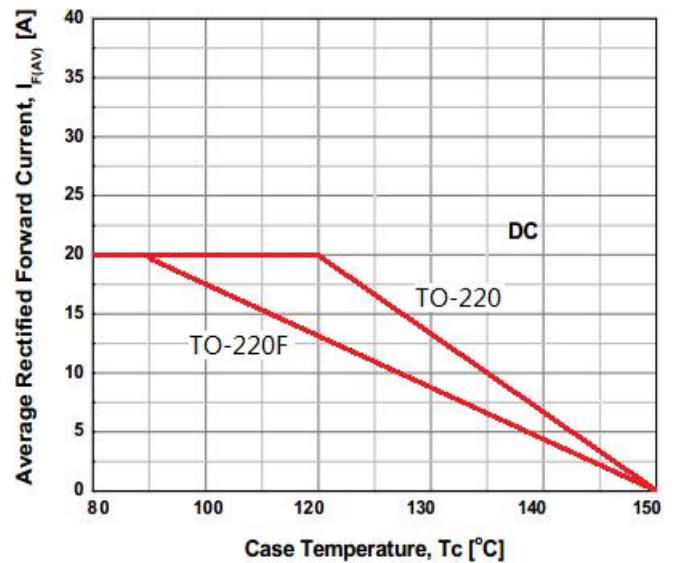
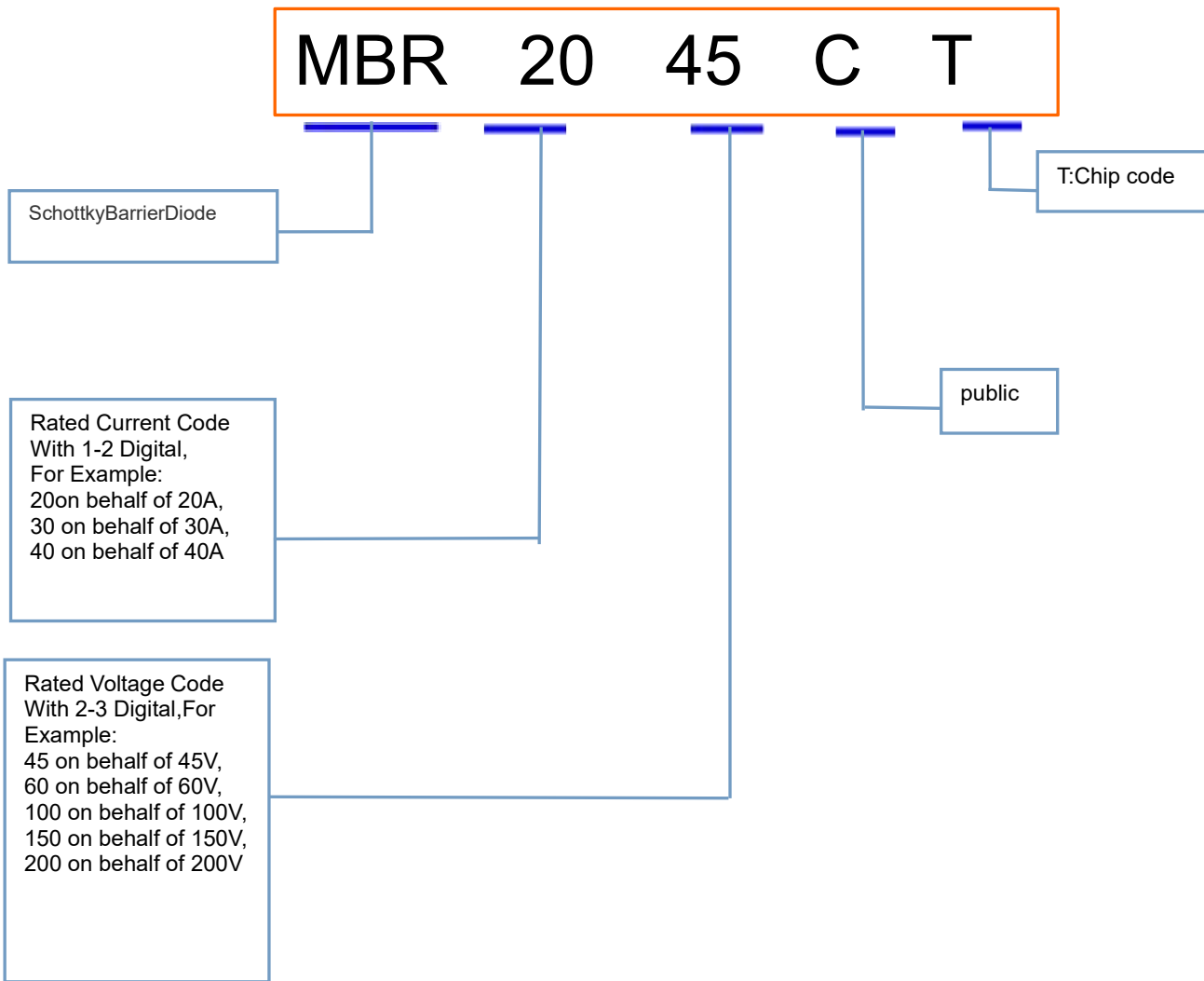


FIGURE 3. FORWARD CURRENT vs FORWARD VOLTAGE



**6 Product Names Rules**

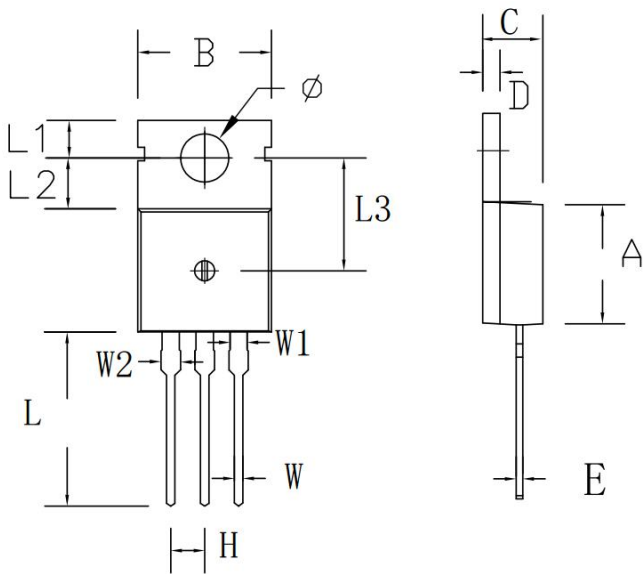


**7 Product Specifications and Packaging Models**

Product Model	Package Type	Mark Name	RoHS	Package	Quantity
MBR2045CT	TO-252	MBR2045CT	Pb-free	Braid	3000/disc
MBR2045CT	TO-220M	MBR2045CT	Pb-free	Tube	1000/box
MBR2045CT	TO-220C	MBR2045CT	Pb-free	Tube	1000/box

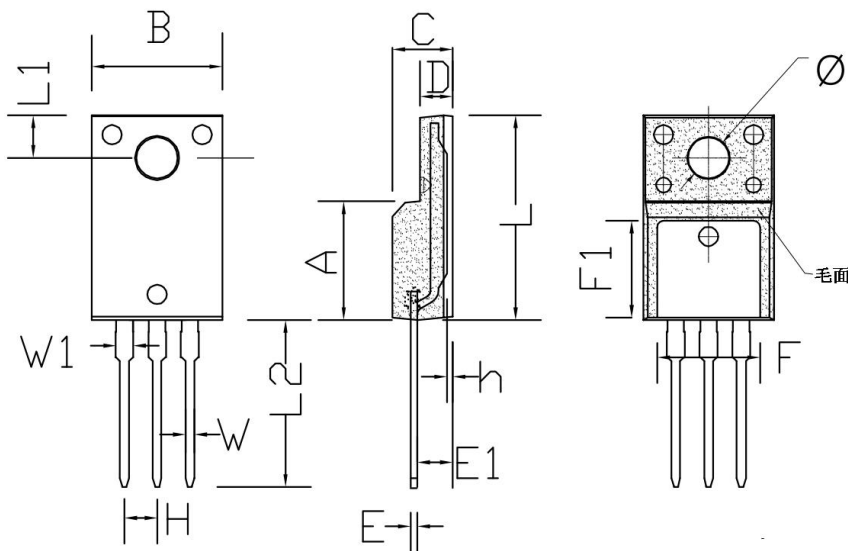
## 8 Dimensions

### TO-220C PACKAGE OUTLINE DIMENSIONS



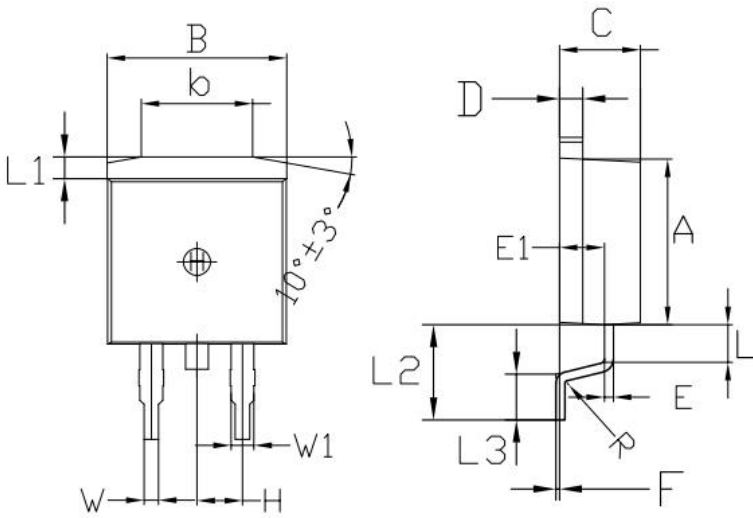
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	min.	max.	min.	max.
A	8.80	9.30	0.346	0.366
B	9.70	10.30	0.382	0.406
C	4.25	4.75	0.167	0.187
D	1.20	1.45	0.047	0.057
E	0.40	0.60	0.016	0.024
H	2.54 TYP		0.100 TYP	
W	0.60	0.95	0.024	0.037
W1	1.05	1.45	0.041	0.057
W2	1.20	1.60	0.047	0.063
L	12.60	13.40	0.496	0.528
L1	2.45	2.95	0.096	0.116
L2	3.45	3.95	0.136	0.156
L3	8.15	8.65	0.321	0.341
Φ	3.50	3.90	0.138	0.154

### TO-220F PACKAGE OUTLINE DIMENSIONS



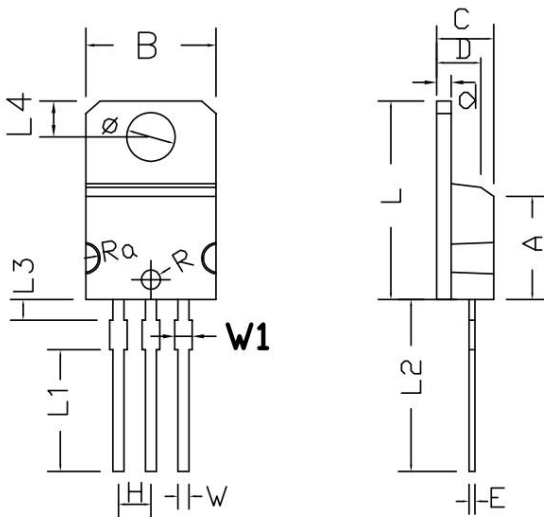
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	min.	max.	min.	max.
A	8.80	9.30	0.346	0.366
B	10.00	10.50	0.394	0.413
C	4.30	4.90	0.169	0.193
D	2.30	2.70	0.091	0.106
L	15.55	16.15	0.612	0.636
h	0.40	0.60	0.016	0.024
L1	3.15	3.55	0.124	0.140
L2	12.65	13.35	0.498	0.526
W	0.70	0.90	0.028	0.035
W1	1.15	1.55	0.045	0.061
H	2.54 TYP		0.100 TYP	
E	0.48	0.53	0.019	0.021
Φ	2.90	3.40	0.114	0.134
E1	2.40	2.90	0.094	0.114
F	7.75	8.25	0.305	0.325
F1	7.35	7.85	0.289	0.309

**TO-263 PACKAGE OUTLINE DIMENSIONS**



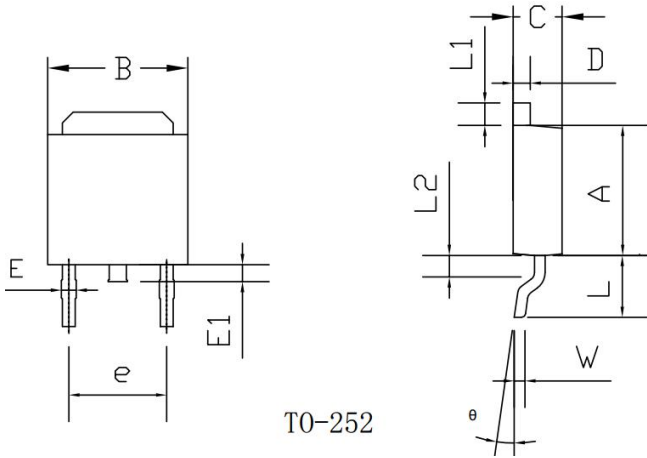
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	min.	max.	min.	max.
A	8.80	9.30	0.346	0.366
B	9.70	10.30	0.382	0.406
C	4.25	4.75	0.167	0.187
D	1.20	1.45	0.047	0.057
E	0.40	0.60	0.016	0.024
L	12.25	13.75	0.482	0.541
L1	1.15	1.45	0.045	0.057
R	0.24	0.26	0.0095	0.0102
W	0.80	0.82	0.0315	0.0323
W1	1.20	1.30	0.047	0.051
H	2.54 TYP		0.200 TYP	
b	5.50	6.50	0.216	0.256
E1	2.4	2.6	0.0946	0.1024
L2	5.20	5.80	0.205	0.228
L3	2.20	3.20	0.087	0.126
F	0.03	0.23	0.0012	0.0091

**TO-220M PACKAGE OUTLINE DIMENSIONS**



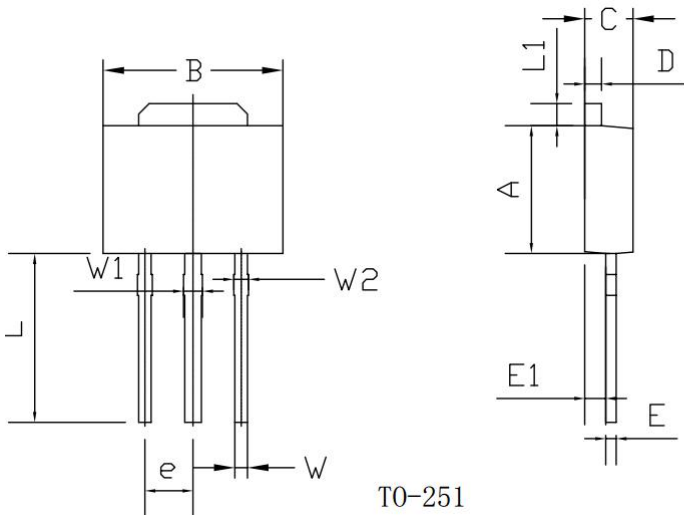
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	min.	max.	min.	max.
	MIN	MAX	MIN	MAX
A	7.55	8.05	0.297	0.317
B	9.85	10.25	0.388	0.404
C	4.20	4.80	0.165	0.189
D	3.20	3.60	0.126	0.142
E	0.42	0.47	0.017	0.019
L	15.20	15.60	0.598	0.614
H	2.52	2.56	0.099	0.101
W	0.78	0.88	0.031	0.035
Φ	3.60	3.90	0.142	0.154
R	0.72	0.78	0.028	0.031
Ra	9.00	10.5	0.354	0.413
d	1.10	1.40	0.043	0.055
L1	9.3	9.7	0.366	0.382
L2	13.00	13.60	0.512	0.535
L3	1.20	1.70	0.047	0.067
L4	2.60	3.0	0.102	0.118
W1	1.10	1.50	0.043	0.059

**T0-252 PACKAGE OUTLINE DIMENSIONS**



Symbol	DimensionsIn Millimeters		DimensionsIn Inches	
	min.	max.	min.	max.
A	5.70	6.30	0.224	0.248
B	6.30	6.90	0.248	0.272
C	2.05	2.55	0.081	0.100
D	0.70	0.90	0.028	0.035
E	0.40	0.60	0.016	0.024
E1	0.60	1.00	0.024	0.039
e	4.50	4.65	0.177	0.183
L	2.75	3.05	0.108	0.120
L1	0.75	1.15	0.030	0.045
L2	0.75	1.25	0.030	0.049
W	0.40	0.60	0.016	0.024
θ	0	8	0	8

**T0-251 PACKAGE OUTLINE DIMENSIONS**



Symbol	DimensionsIn Millimeters		DimensionsIn Inches	
	min.	max.	min.	max.
A	5.70	6.30	0.224	0.248
B	6.30	6.90	0.248	0.272
C	2.05	2.55	0.081	0.100
D	0.70	0.90	0.028	0.035
E	0.40	0.60	0.016	0.024
E1	0.85	1.25	0.037	0.041
e	2.29	2.31	0.090	0.091
L	7.80	8.20	0.307	0.323
L1	0.75	1.15	0.030	0.045
W	0.55	0.65	0.022	0.026
W1	0.75	1.15	0.030	0.045
W2	0.60	0.80	0.024	0.031

## 9 Attentions

- Jiangsu Donghai Semiconductor Co.,Ltd., Ltd. reserves the right to change the specification without prior notice! The customer should obtain the latest version of the information before making the order and verify that the information is complete and up to date.
- It is the responsibility of the purchaser for any failure or failure of any semiconductor product under certain conditions. It is the responsibility of the purchaser to comply with safety standards and to take safety measures in the system design and machine manufacturing of Jiangsu Donghai Semiconductor Co.,Ltd. products in order to avoid potential risk of failure. Injury or property damage.
- Product promotion is endless, our company will be dedicated to provide customers with better products.

## 11 Appendix

Revision history:

Date	REV.	Description	Page
2017.09.20	1.0	Original	
2018.7.26	1.1	Add to ESD	First Page
2022.01.01	1.2	Modify company name	All