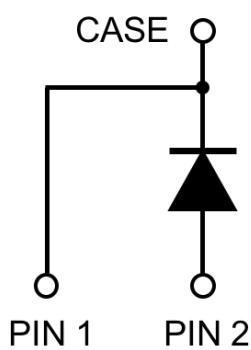


Package TO-220-2L

Inner Circuit

Product Summary

V_R	650 V	
I_F	12A ($T_c = 135^\circ\text{C}$)	10A ($T_c = 145^\circ\text{C}$)
Q_C	19 nC	


Features

- ◆ Low Conduction and Switching Loss
- ◆ Positive Temperature Coefficient on V_F
- ◆ Temperature Independent Switching Behavior
- ◆ Fast Reverse Recovery
- ◆ High Surge Current Capability
- ◆ Pb-free lead plating

Benefits

- ◆ Higher System Efficiency
- ◆ Parallel Device Convenience
- ◆ High Temperature Application
- ◆ High Frequency Operation
- ◆ Hard Switching & High Reliability
- ◆ Environmental Protection

Applications

- ◆ SMPS
- ◆ PFC
- ◆ Solar/ Wind Renewable Energy
- ◆ Power Inverters
- ◆ Motor Drives
- ◆ UPS

Maximum Ratings

Parameter	Symbol	Test Conditions	Value	Unit
Peak Repetitive Reverse Voltage	V_{RRM}	$T_J = 25^\circ\text{C}$	650	V
Peak Reverse Surge Voltage	V_{RSM}	$T_J = 25^\circ\text{C}$	650	V
DC Blocking Voltage	V_R	$T_J = 25^\circ\text{C}$	650	V
Continuous Forward Current	I_F	$T_c = 25^\circ\text{C}$	26	A
		$T_c = 135^\circ\text{C}$	12	A
		$T_c = 145^\circ\text{C}$	10	A

Maximum Ratings

Parameter	Symbol	Test Conditions	Value	Unit
Non-Repetitive Peak Forward Surge Current	I_{FSM}	$T_C = 25^\circ\text{C}, T_P = 10 \text{ ms}$ Half Sine Wave	67	A
		$T_C = 125^\circ\text{C}, T_P = 10 \text{ ms}$ Half Sine Wave	61	A
		$T_C = 25^\circ\text{C}, T_P = 10 \mu\text{s}$ Pulse	451	A
Repetitive Peak Forward Surge Current	I_{FRM}	$T_C = 25^\circ\text{C}, T_P = 10 \text{ ms}$ Half Sine Wave, D = 0.1	51	A
		$T_C = 125^\circ\text{C}, T_P = 10 \text{ ms}$ Half Sine Wave, D = 0.1	46	A
Power Dissipation	P_D	$T_C = 25^\circ\text{C}$	88	W
		$T_C = 125^\circ\text{C}$	29	W
Operating Junction and Storage Temperature	T_J		175	°C
	T_{stg}		-55 to 175	°C
Thermal Resistance Junction to Case	$R_{\Theta JC}$		1.7	°C/W

Electrical Characteristics

Parameter	Symbol	Test Conditions	Typ.	Max.	Unit
DC Blocking Voltage	V_{DC}	$I_R = 100 \mu\text{A}, T_J = 25^\circ\text{C}$	> 650		V
Forward Voltage	V_F	$I_F = 10\text{A}, T_J = 25^\circ\text{C}$	1.5	1.8	V
		$I_F = 10\text{A}, T_J = 175^\circ\text{C}$	1.9	2.2	V
Reverse Current	I_R	$V_R = 600\text{V}, T_J = 25^\circ\text{C}$	< 1	50	μA
		$V_R = 600\text{V}, T_J = 175^\circ\text{C}$	15	160	μA
Total Capacitive Charge	Q_C	$I_F = 10\text{A}, dI/dt=300\text{A}/\mu\text{s}, V_R=400\text{V}, T_J=25^\circ\text{C}$	19		nC
Total Capacitance	C	$V_R=1\text{V}, T_J=25^\circ\text{C}, f=1 \text{ MHz}$	398		
		$V_R=200\text{V}, T_J=25^\circ\text{C}, f=1 \text{ MHz}$	53		pF
		$V_R=400\text{V}, T_J=25^\circ\text{C}, f=1 \text{ MHz}$	52		

Device Performances

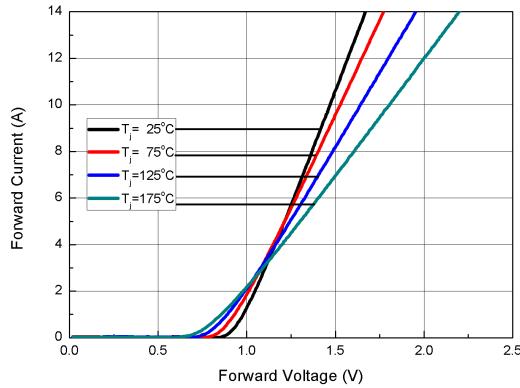


Fig. 1 Forward Characteristics

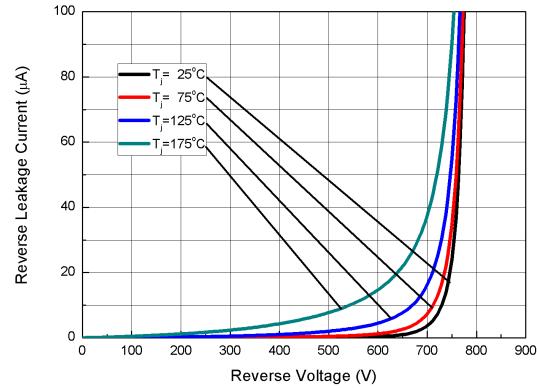


Fig. 2 Reverse Characteristics

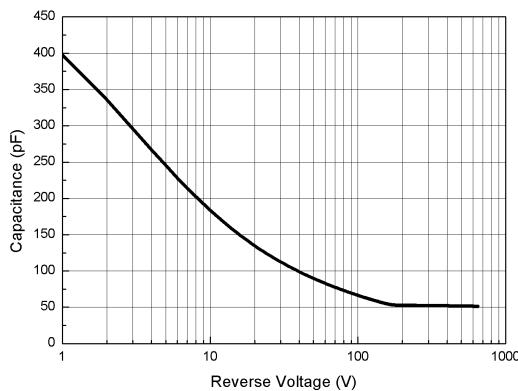


Fig. 3 Capacitance vs. Reverse Voltage

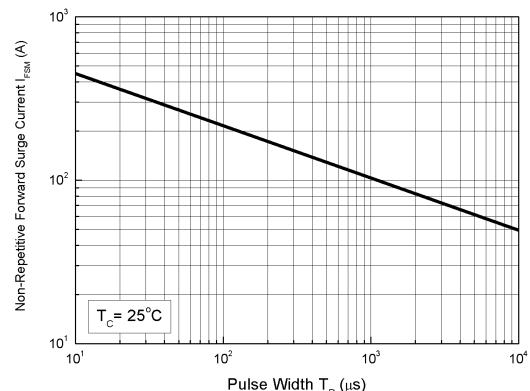


Fig. 4 Non-Repetitive Peak Forward Surge Current (Pulse Mode)

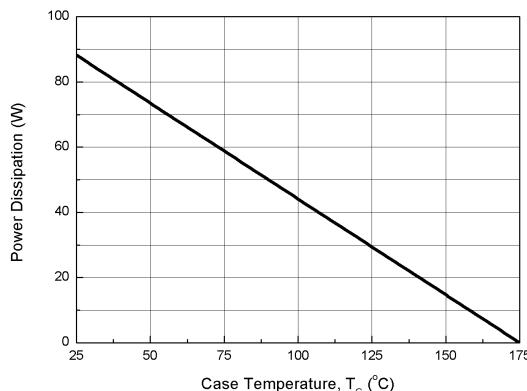


Fig. 5 Power Derating

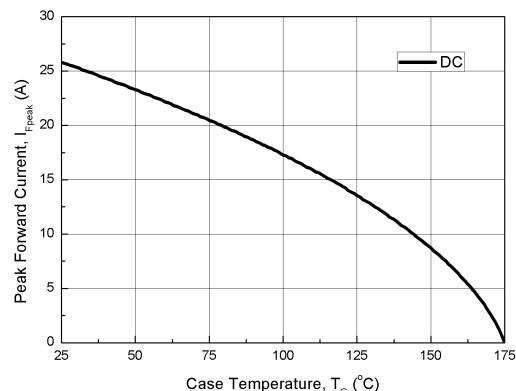
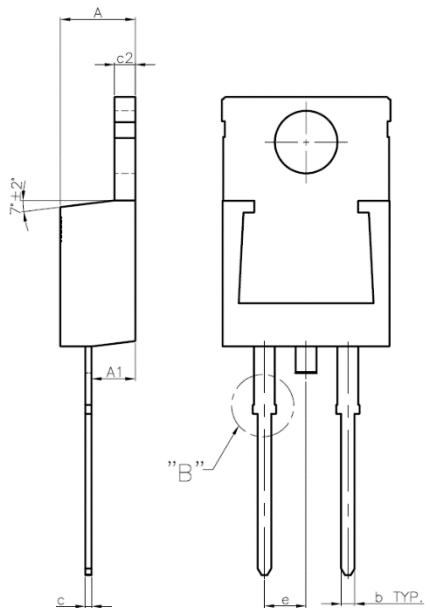
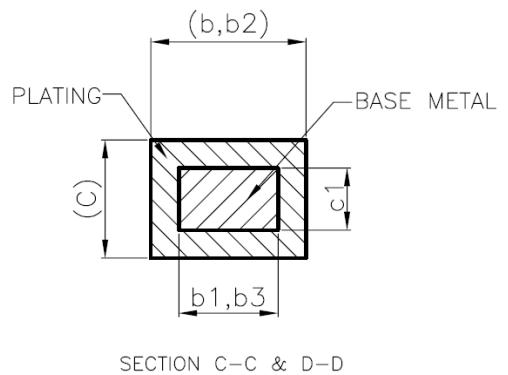
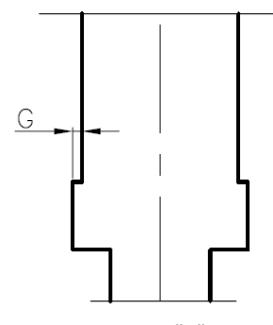
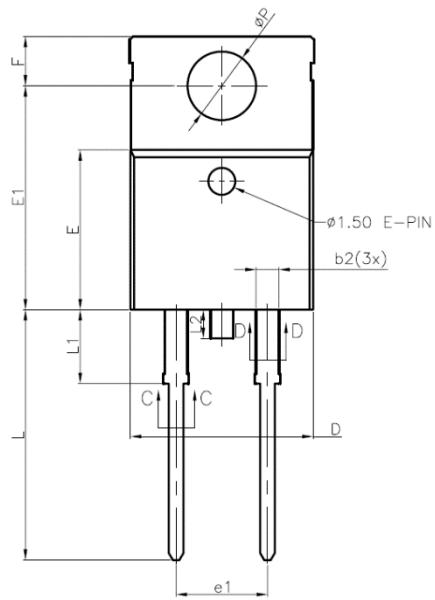


Fig. 6 Current Derating

Package Dimensions
TO-220-2L


SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	4.470	—	4.670	0.176	—	0.184
A1	2.520	—	2.820	0.099	—	0.111
b	0.710	0.813	0.910	0.028	0.032	0.036
b1	0.710	—	0.910	0.028	—	0.036
b2	1.170	1.270	1.370	0.046	0.050	0.054
b3	1.170	—	1.370	0.046	—	0.054
c	0.279	—	0.483	0.011	—	0.019
c1	0.279	—	0.432	0.011	—	0.017
c2	1.170	—	1.370	0.046	—	0.054
D	10.010	—	10.310	0.394	—	0.406
E	8.763	8.890	9.017	0.345	0.350	0.355
E1	12.294	12.446	12.548	0.484	0.490	0.494
e	—	2.54 BSC	—	—	0.100 BSC	—
e1	4.980	—	5.180	0.196	—	0.204
F	2.642	2.743	2.946	0.104	0.108	0.116
G	0.000	—	0.127	0.000	—	0.005
L	13.700	—	14.10	0.539	—	0.555
L1	4.04	4.11	4.19	0.159	0.162	0.165
L2	—	—	1.60	—	—	0.063
ØP	3.790	—	3.890	0.149	—	0.153


NOTES:

1. All dimension are in mm[inch].
2. Tolerance : ± 0.004 inch.