

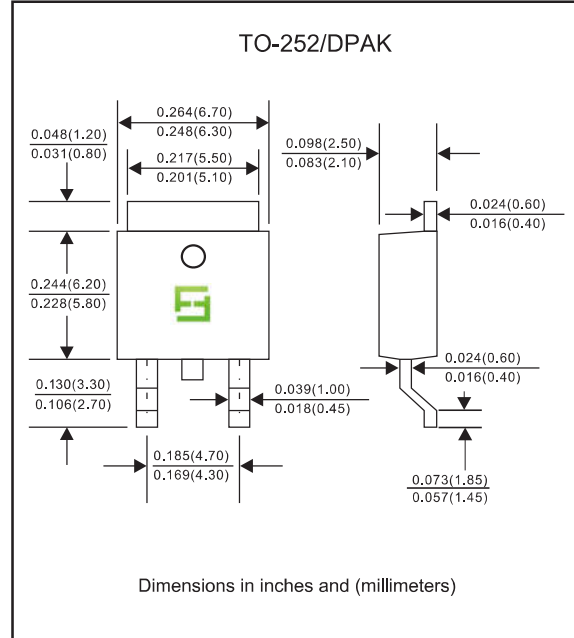
**Features**

- Batch process design, excellent power dissipation offers better reverse leakage current and thermal resistance.
- Low power loss, high efficiency.
- High current capability, low forward voltage drop.
- High surge capability.
- Guardring for overvoltage protection.
- Ultra high-speed switching.
- Silicon epitaxial planar chip, metal silicon junction.
- Lead-free parts meet environmental standards of MIL-STD-19500 /228

**Mechanical data**

- Epoxy:UL94-V0 rated flame retardant
- Case : Molded plastic, TO-252/DPAK
- Terminals : Solder plated, solderable per MIL-STD-750, Method 2026
- Mounting Position : Any

**Package outline**



**Maximum ratings and Electrical Characteristics** (AT  $T_A=25^{\circ}\text{C}$  unless otherwise noted)

PARAMETER	CONDITIONS	Symbol	MIN.	TYP.	MAX.	UNIT
Forward rectified current	See Fig.1	$I_O$			20.0	A
Forward surge current	8.3ms single half sine-wave (JEDEC methode)	$I_{FSM}$			150	A
Reverse current	$V_R = V_{RRM} T_J = 25^{\circ}\text{C}$	$I_R$			0.1	mA
	$V_R = V_{RRM} T_J = 125^{\circ}\text{C}$				15	
Diode junction capacitance	f=1MHz and applied 4V DC reverse voltage	$C_J$		560		pF
Storage temperature		$T_{STG}$	-55		+150	$^{\circ}\text{C}$

SYMBOLS	$V_{RRM}^{*1}$ (V)	$V_{RMS}^{*2}$ (V)	$V_R^{*3}$ (V)	$V_F^{*4}$ (V)	$V_F^{*5}$ (V)	Operating temperature $T_J, (^{\circ}\text{C})$
MBRD1045T4G	45	31.5	45	0.60	0.84	-55 to +150

\*1 Repetitive peak reverse voltage

\*2 RMS voltage

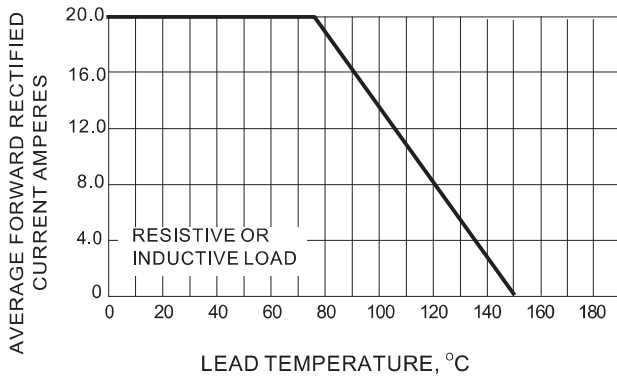
\*3 Continuous reverse voltage

\*4 Maximum forward voltage  
 $I_F = 10.0\text{A}, 25^{\circ}\text{C}$

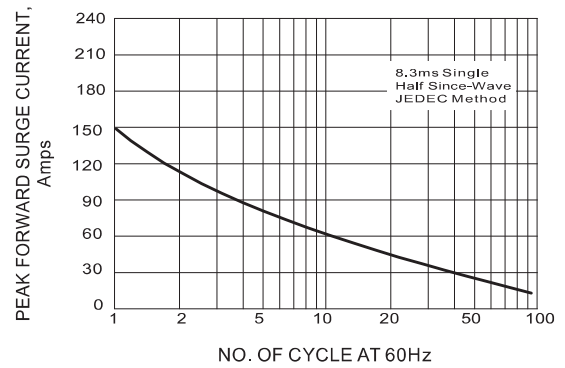
\*5 Maximum of forward voltage  
 $I_F=20.0\text{A}, 25^{\circ}\text{C}$

**Rating and characteristic curves**

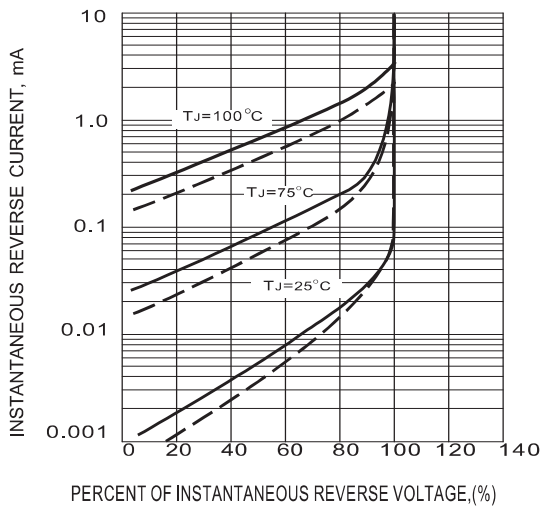
**Fig.1- FORWARD CURRENT DERATING CURVE**



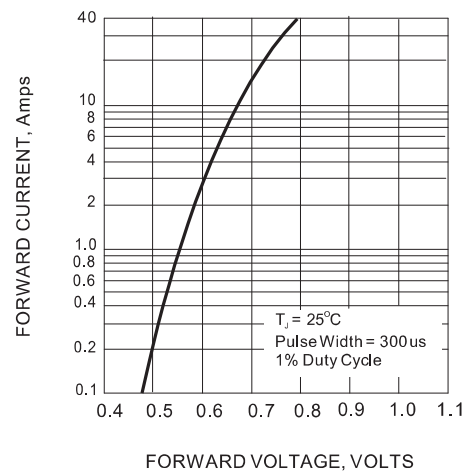
**Fig.2- MAXIMUM NON - REPETITIVE SURGE CURRENT**



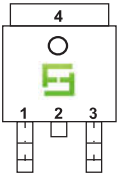
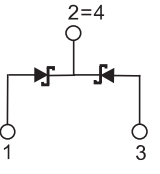
**Fig.3- TYPICAL REVERSE CHARACTERISTICS**



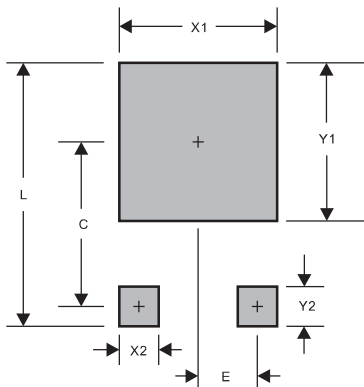
**Fig.4- TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS**



**Pinning information**

Pin	Simplified outline	Symbol	Marking
Pin1 anode Pin2=4 cathode Pin3 anode			B2045

**Suggested solder pad layout**

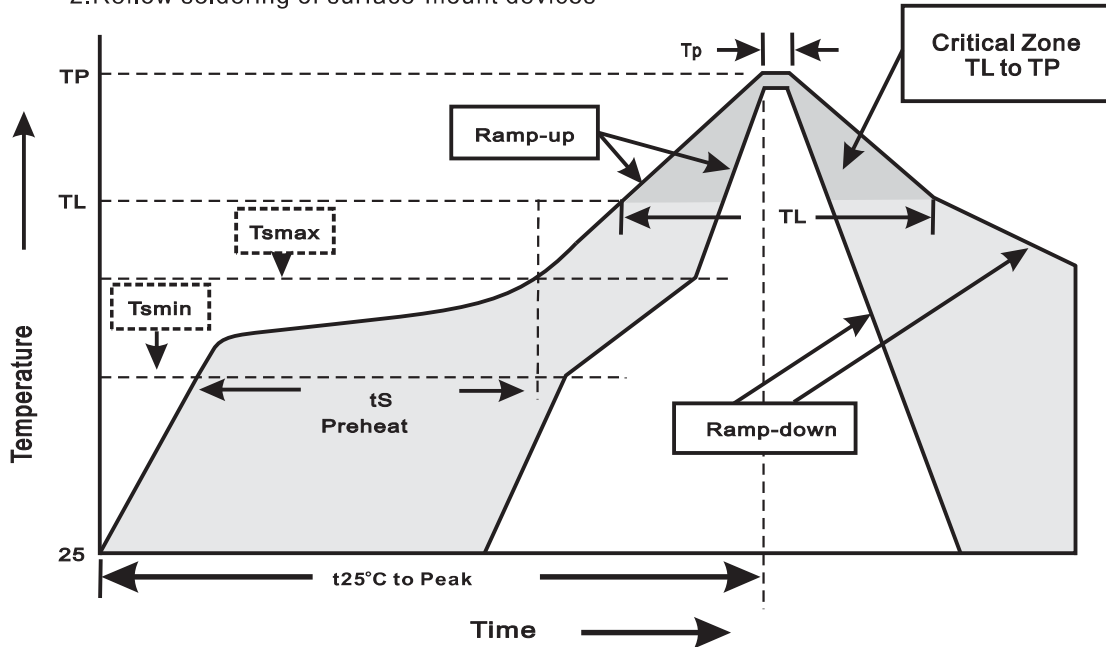


PACKAGE	DPAK
C	0.272(6.90)
E	0.091(2.30)
L	0.457(11.60)
X1	0.276(7.00)
X2	0.059(1.50)
Y1	0.276(7.00)
Y2	0.098(2.50)

Dimensions in inches and (millimeters)

**Suggested thermal profiles for soldering processes**

- 1.Storage environment: Temperature=5°C~40°C Humidity=55%±25%
- 2.Reflow soldering of surface-mount devices



3.Reflow soldering

Profile Feature	Soldering Condition
Average ramp-up rate(TL to TP)	<3°C/sec
Preheat -Temperature Min(Tsmin) -Temperature Max(Tsmax) -Time(min to max)(ts)	150°C 200°C 60~120sec
Tsmax to TL -Ramp-upRate	<3°C/sec
Time maintained above: -Temperature(TL) -Time(tL)	217°C 60~260sec
Peak Temperature(TP)	255°C-0/+5°C
Time within 5°C of actual Peak Temperature(tp)	10~30sec
Ramp-down Rate	<6°C/sec
Time 25°C to Peak Temperature	<6minutes