



# THE DATASHEET OF RBO08-40G





## RBO08-40G/T

Application Specific Discretes  
A.S.D.™

## REVERSED BATTERY AND OVERVOLTAGE PROTECTION

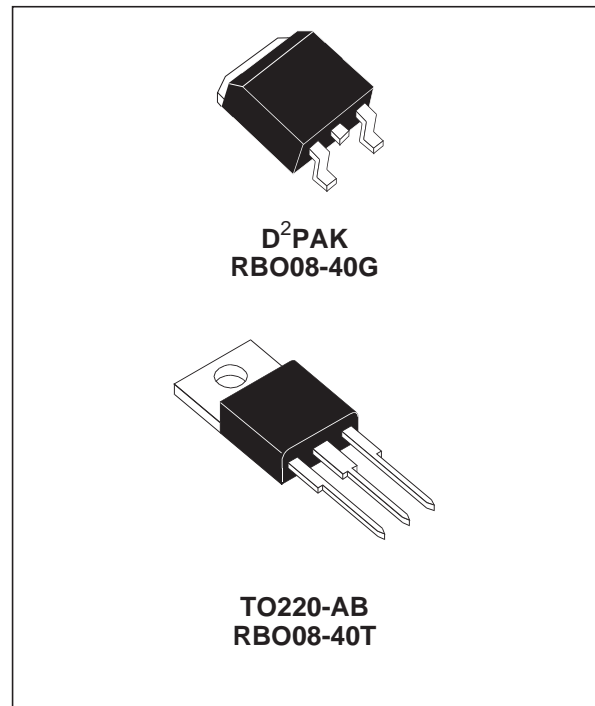
### FEATURES

- 8A DIODE TO GUARD AGAINST BATTERY REVERSAL.
- NEGATIVE OVERVOLTAGE PROTECTION BY CLAMPING.
- COMPLIANT WITH ISO/DTR 7637 STANDARD FOR PULSES 1, 2, 3a and 3b.
- SUITABLE FOR AUTOPROTECTED ALTERNATOR ENVIRONMENT.
- BREAKDOWN VOLTAGE : 24 V min.
- CLAMPING VOLTAGE :  $\pm 40$  V max.
- MONOLITHIC STRUCTURE FOR GREATER RELIABILITY.

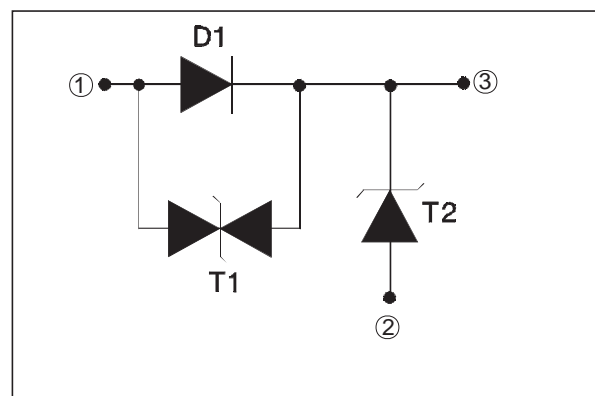
### DESCRIPTION

Designed to protect against battery reversal and overvoltages in automotive applications, this monolithic component offers multiple functions in the same package :

- D1 : reversed battery protection
- T1 : clamping against negative overvoltages
- T2 : Transil function for overvoltage protection.



### FUNCTIONAL DIAGRAM



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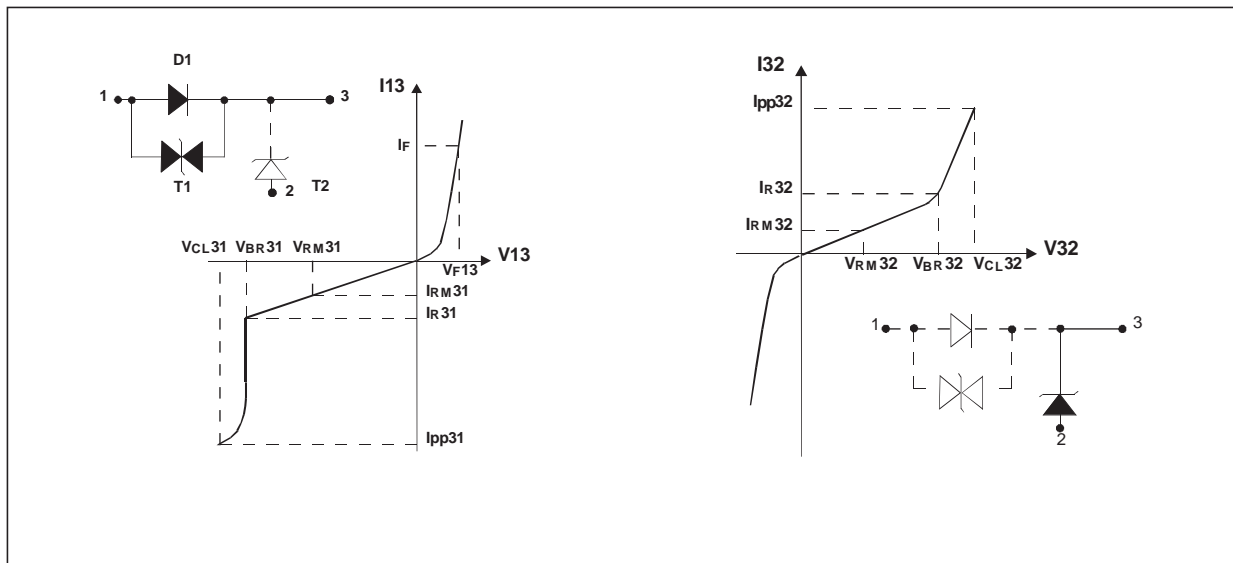
**ABSOLUTE MAXIMUM RATINGS**

Symbol	Parameter		Value	Unit
$I_{FSM}$	Non repetitive surge peak forward current (Diode D1)	$t_p = 10\text{ ms}$	80	A
$I_F$	DC forward current (Diode D1)	$T_c = 75^\circ\text{C}$	8	A
$P_{PP}$	Peak pulse power between Input and Output (Transil T1) see note 1 $T_j$ initial = $25^\circ\text{C}$	10/1000 $\mu\text{s}$	600	W
$P_{PP}$	Peak pulse power between Pins 3 and 2 (10/1000 $\mu\text{s}$ )		1500	W
$T_{stg}$ $T_j$	Storage temperature range Maximum junction temperature		- 40 to + 150 150	$^\circ\text{C}$
$T_L$	Maximum lead temperature for soldering during 10 s at 4.5mm from case for TO220-AB		260	$^\circ\text{C}$

**Note 1 :** for a surge greater than the maximum value, the device will fail in short-circuit..

**THERMAL RESISTANCE**

Symbol	Parameter		Value	Unit
$R_{th(j-c)}$	Junction to case	RBO08-40M RBO08-40T	2.4 2.4	$^\circ\text{C/W}$



Symbol	Parameter
$V_{RM31}/V_{RM32}$	Stand-off voltage Transil T1 / Transil T2.
$V_{BR31}/V_{BR32}$	Breakdown voltage Transil T1 / Transil T2.
$I_{R31}/I_{R32}$	Leakage current Transil T1 / Transil T2.
$V_{CL31}/V_{CL32}$	Clamping voltage Transil T1 / Transil T2.
$V_{F13}$	Forward voltage drop Diode D1.
$I_{PP}$	Peak pulse current.
$\alpha T$	Temperature coefficient of $V_{BR}$ .
$C_{31}/C_{32}$	Capacitance Transil T1 / Transil T2.

**ELECTRICAL CHARACTERISTICS : DIODE D1** (- 40°C <  $T_{amb}$  < + 85°C)

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
$V_{F13}$	$I_F = 8\text{ A}$	RBO08-40G			1.5	V
		RBO08-40T			1.7	V
	$I_F = 8\text{ A} @ T_{amb} = 25^\circ\text{C}$				1.45	V
$V_{F13}$	$I_F = 4\text{ A}$	RBO08-40G			1.3	V
		RBO08-40T			1.35	V
	$I_F = 4\text{ A} @ T_{amb} = 25^\circ\text{C}$				1.2	V
$V_{F13}$	$I_F = 1\text{ A}$				1.1	V
		$I_F = 1\text{ A} @ T_{amb} = 25^\circ\text{C}$				1.0
	$I_F = 1\text{ A} @ T_j = 85^\circ\text{C}$				0.9	V

**ELECTRICAL CHARACTERISTICS : TRANSIL T1** (- 40°C <  $T_{amb}$  < + 85°C)

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
$V_{BR31}$	$I_R = 1\text{ mA}$		22		35	V
$V_{BR31}$	$I_R = 1\text{ mA}, T_{amb} = 25^\circ\text{C}$		24		32	V
$I_{RM31}$	$V_{RM} = 20\text{ V}$				50	$\mu\text{A}$
$I_{RM31}$	$V_{RM} = 20\text{ V}, T_{amb} = 25^\circ\text{C}$				10	$\mu\text{A}$
$V_{CL31}$	$I_{PP} = 15\text{ A}, T_j \text{ initial} = 25^\circ\text{C}$	10/1000 $\mu\text{s}$			40	V
$\alpha T$	Temperature coefficient of $V_{BR}$				9	$10^{-4}/^\circ\text{C}$
$C_{31}$	$F = 1\text{ MHz}$	$V_R = 0\text{ V}$		1000		pF

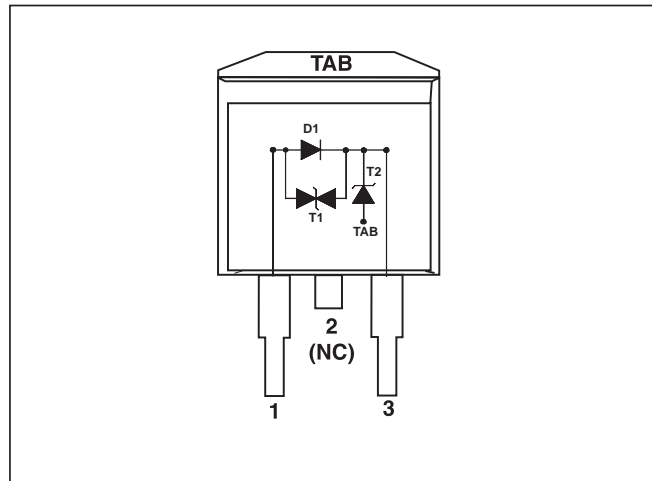
**ELECTRICAL CHARACTERISTICS : TRANSIL T2** (- 40°C <  $T_{amb}$  < + 85°C)

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
$V_{BR32}$	$I_R = 1\text{ mA}$		22		35	V
$V_{BR32}$	$I_R = 1\text{ mA}, T_{amb} = 25^\circ\text{C}$		24		32	V
$I_{RM32}$	$V_{RM} = 20\text{ V}$				50	$\mu\text{A}$
$I_{RM32}$	$V_{RM} = 20\text{ V}, T_{amb} = 25^\circ\text{C}$				10	$\mu\text{A}$
$V_{CL32}$	$I_{PP} = 37.5\text{ A}$	10/1000 $\mu\text{s}$			40	V
$\alpha T$	Temperature coefficient of $V_{BR}$				8.5	$10^{-4}/^\circ\text{C}$



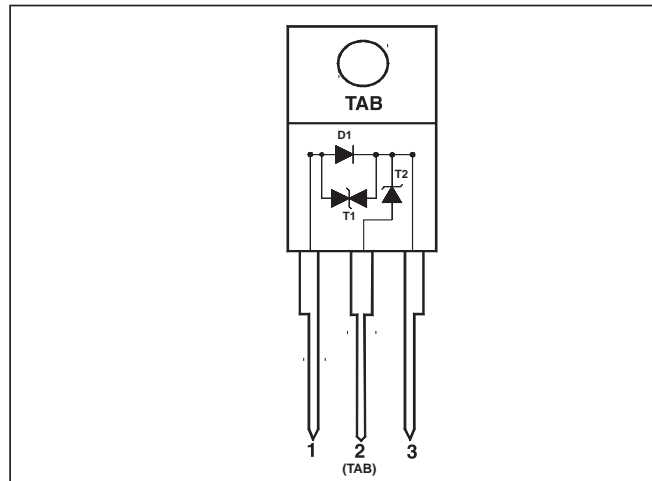
**PINOUT configuration in D<sup>2</sup>PAK :**

- Input (1) : Pin 1
- Output (3) : Pin 3
- Gnd (2) : Connected to base Tab

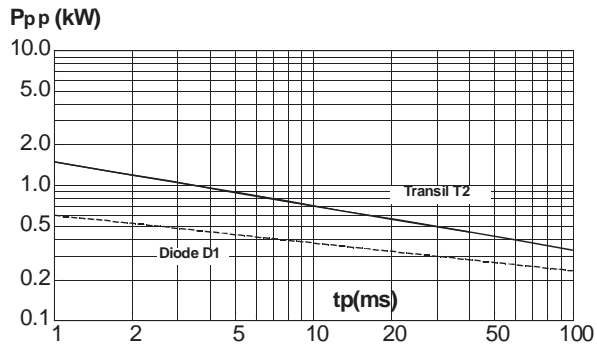


**PINOUT configuration in TO220AB :**

- Input (1) : Pin 1
- Output (3) : Pin 3
- GND (2) : Connected to base Tab

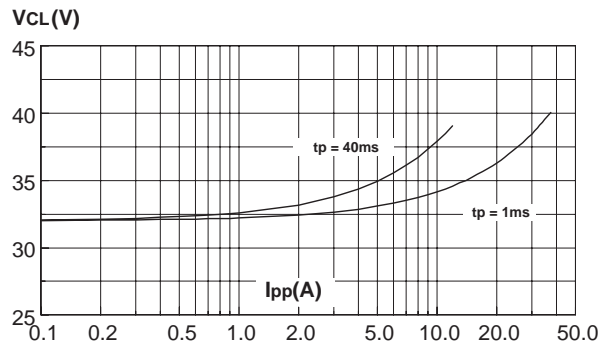


**Fig. 1 :** Peak pulse power versus exponential pulse duration ( $T_j$  initial = 85°C).



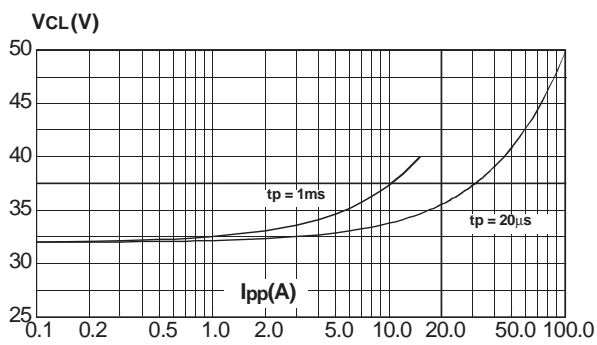
**Fig. 2-1 :** Clamping voltage versus peak pulse current ( $T_j$  initial = 85°C).

Exponential waveform  $t_p = 40$  ms and  $t_p = 1$  ms (TRANSIL T2).

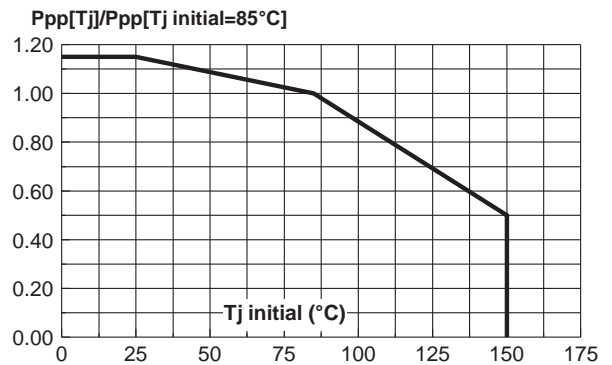


**Fig. 2-2 :** Clamping voltage versus peak pulse current ( $T_j$  initial = 85°C).

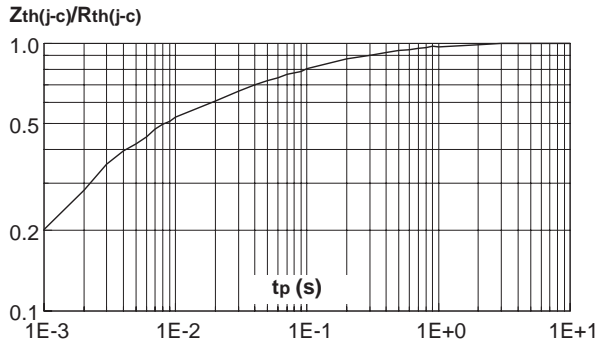
Exponential waveform  $t_p = 1$  ms and  $t_p = 20 \mu s$  (TRANSIL T1).



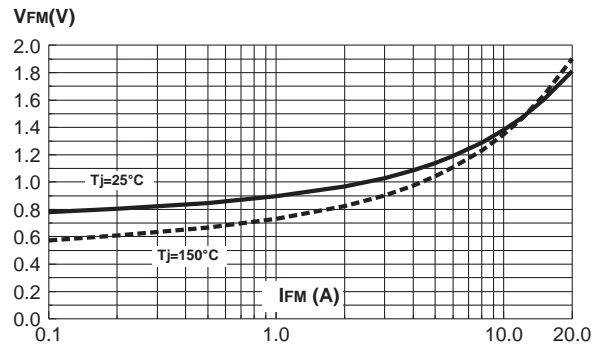
**Fig. 3 :** Relative variation of peak pulse power versus junction temperature.



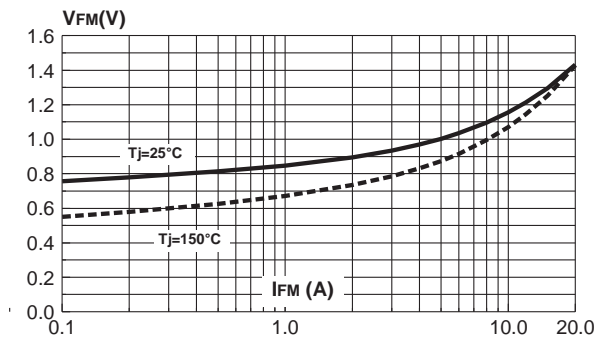
**Fig. 4 :** Relative variation of thermal impedance junction to case versus pulse duration.



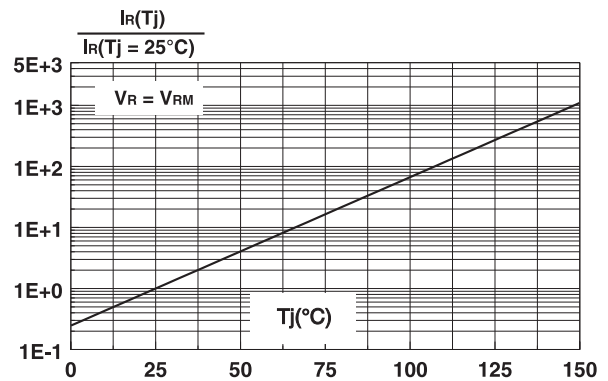
**Fig. 5-1 :** Peak forward voltage drop versus peak forward current (typical values) - (TRANSIL T2).



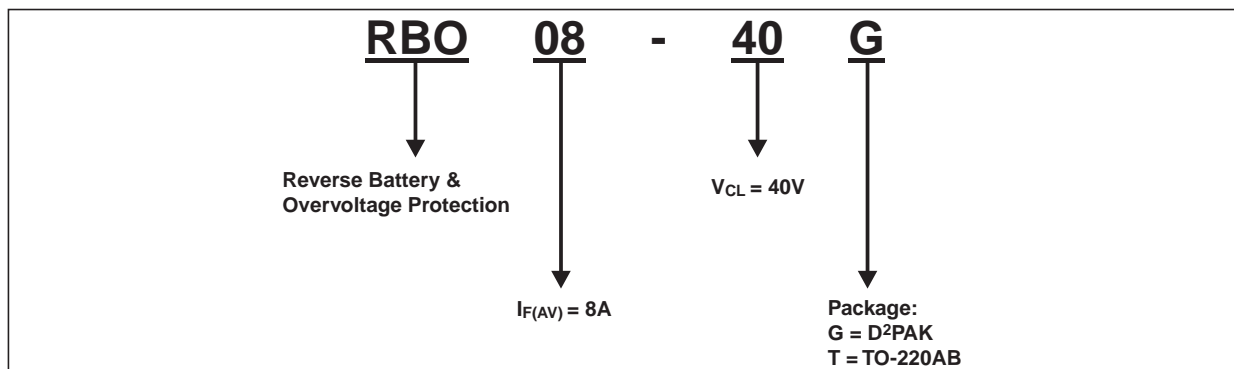
**Fig. 5-2 :** Peak forward voltage drop versus peak forward current (typical values) - (DIODE D1).



**Fig. 6 :** Relative variation of leakage current versus junction temperature.



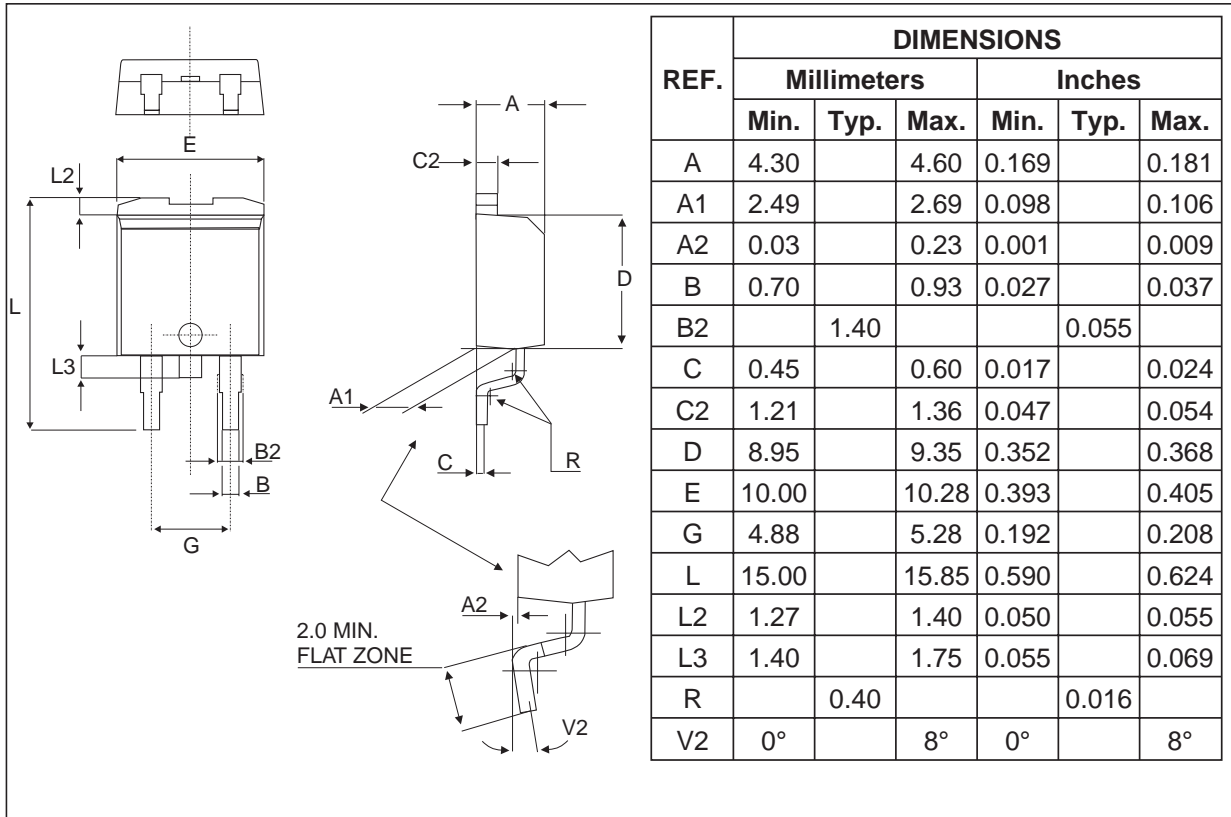
**ORDERING INFORMATION**



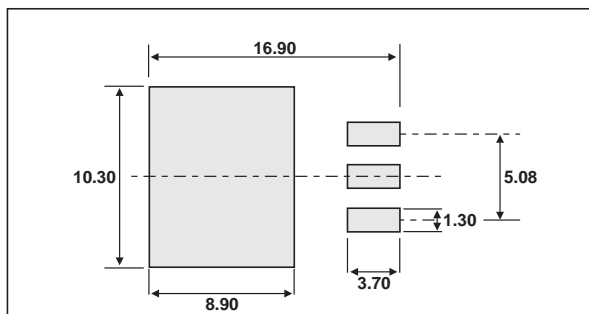
**RBO08-40G / RBO08-40T**

**PACKAGE MECHANICAL DATA**

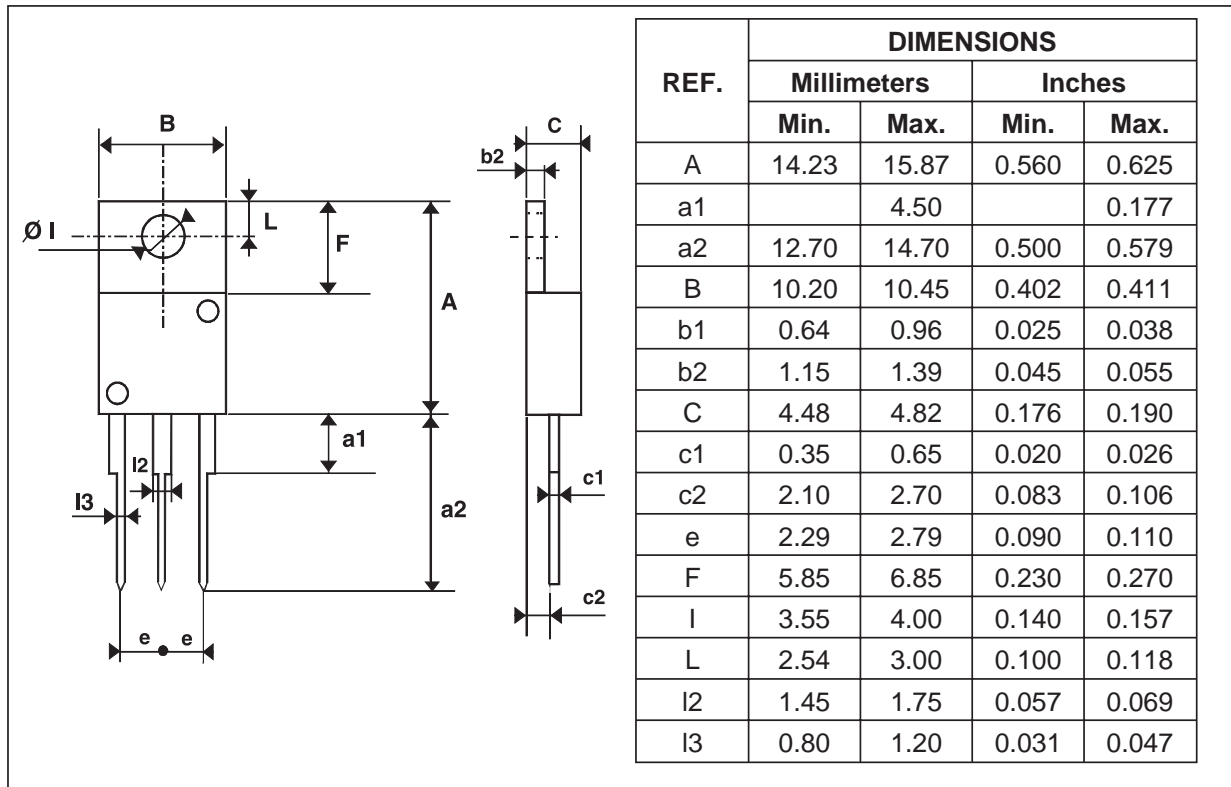
D<sup>2</sup>PAK Plastic



**FOOT-PRINT D<sup>2</sup>PAK**



**PACKAGE MECHANICAL DATA**  
TO-220AB Plastic



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