



RBO08-40G/T

Application Specific Discretes
A.S.D.TM

REVERSED BATTERY AND OVERVOLTAGE PROTECTION

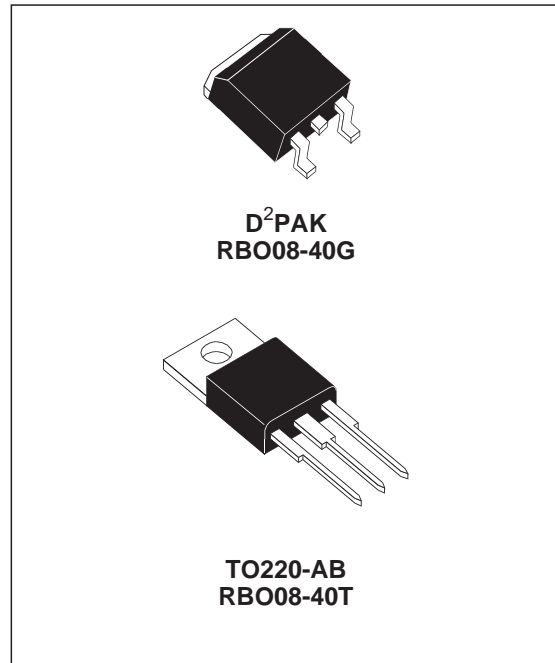
FEATURES

- 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 : ± 40 V max.
- MONOLITHIC STRUCTURE FOR GREATER RELIABILITY.

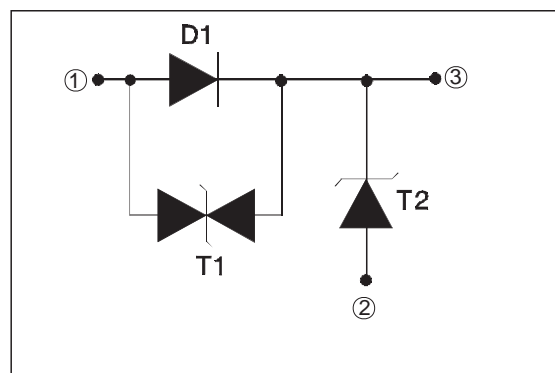
DESCRIPTION

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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October 2003 - Ed: 3

1/9

RBO08-40G / RBO08-40T

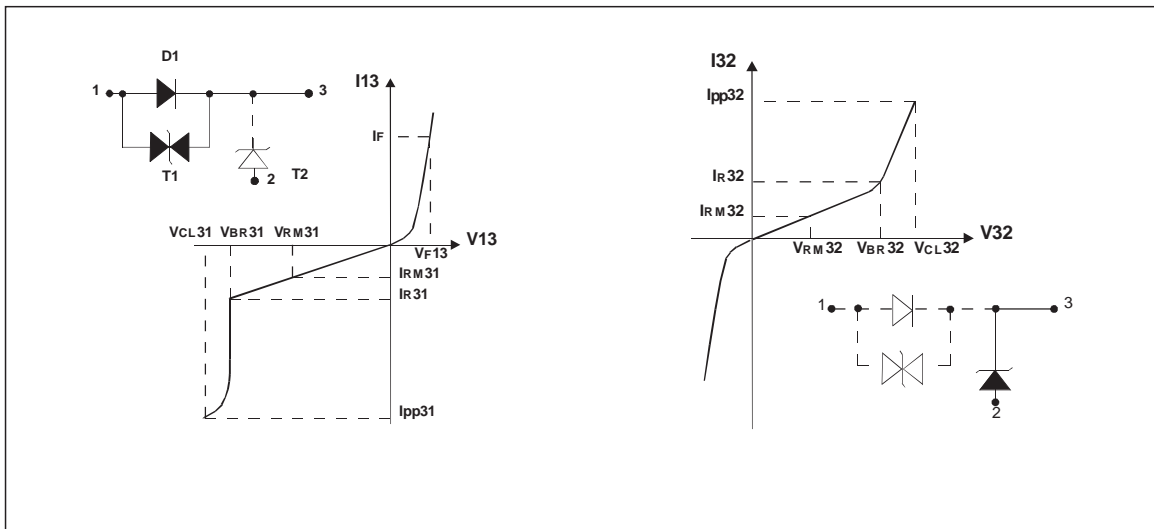
ABSOLUTE MAXIMUM RATINGS

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°C	10/1000 μs	600	W
P_{PP}	Peak pulse power between Pins 3 and 2 (10/1000 μs)		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	$^\circ\text{C}/\text{W}$



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.
αT	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

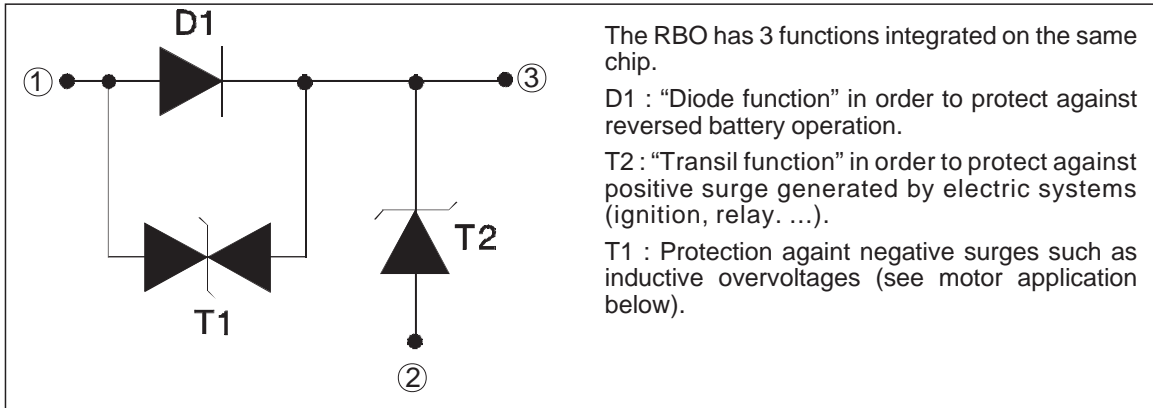
ELECTRICAL CHARACTERISTICS : TRANSIL T1 (- 40°C < T_{amb} < + 85°C)

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	μA
I_{RM31}	$V_{RM} = 20\text{ V}, T_{amb} = 25^\circ\text{C}$			10	μA
V_{CL31}	$I_{PP} = 15\text{ A}, T_j \text{ initial} = 25^\circ\text{C}$		10/1000 μs	40	V
αT	Temperature coefficient of V_{BR}			9	$10^{-4}/^\circ\text{C}$
C_{31}	$F = 1\text{ MHz } V_R = 0\text{ V}$		1000		pF

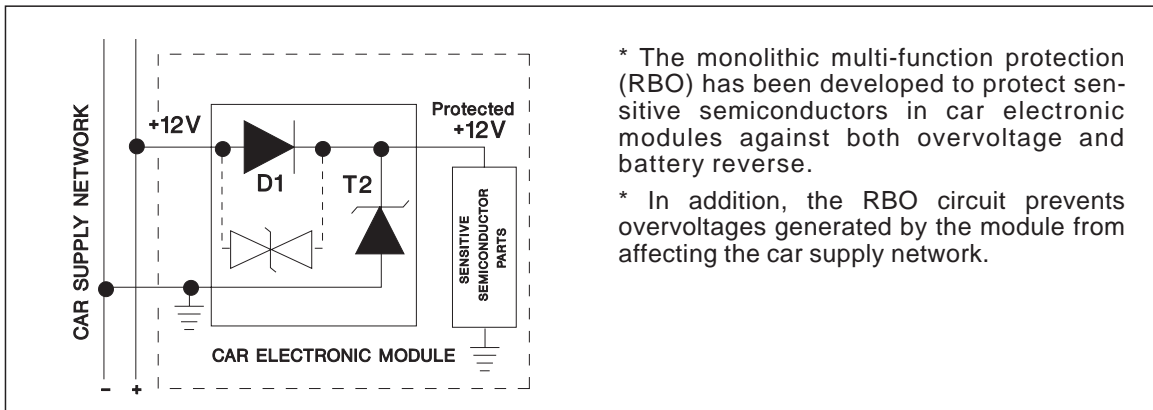
ELECTRICAL CHARACTERISTICS : TRANSIL T2 (- 40°C < T_{amb} < + 85°C)

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	μA
I_{RM32}	$V_{RM} = 20\text{ V}, T_{amb} = 25^\circ\text{C}$			10	μA
V_{CL32}	$I_{PP} = 37.5\text{ A}$		10/1000 μs	40	V
αT	Temperature coefficient of V_{BR}			8.5	$10^{-4}/^\circ\text{C}$

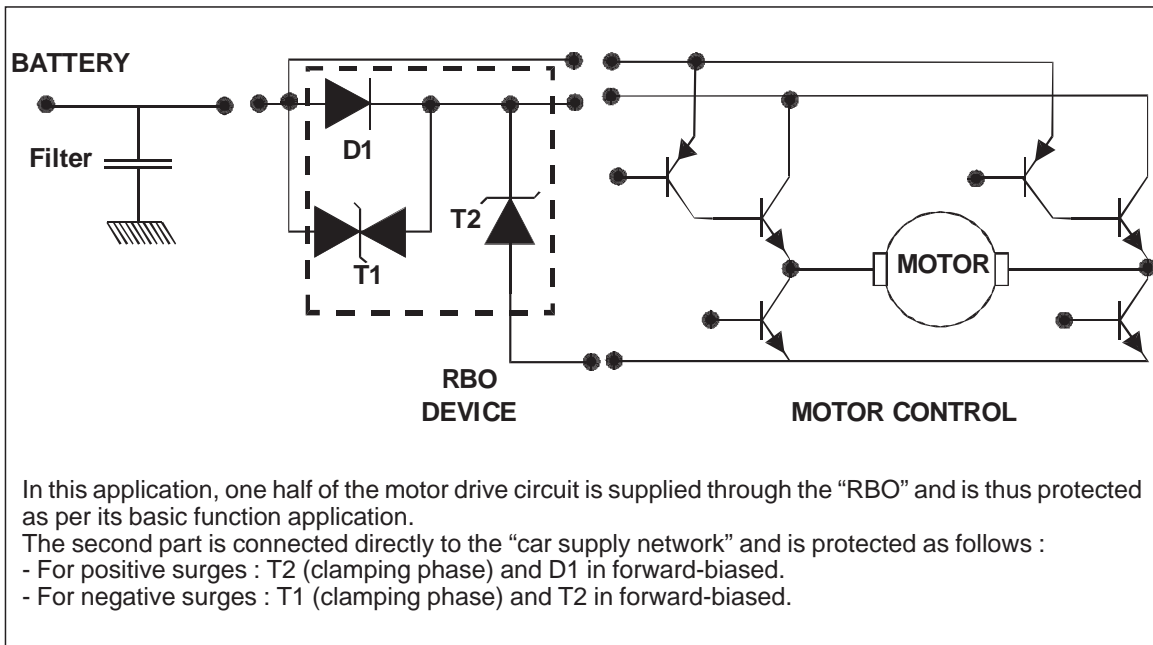
PRODUCT DESCRIPTION



BASIC APPLICATION

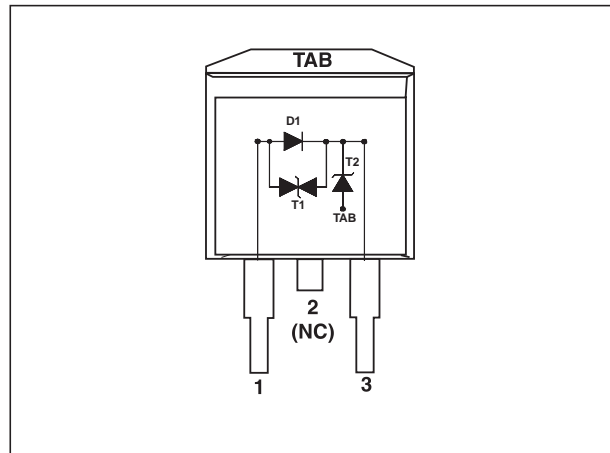


MOTOR DRIVER APPLICATION



PINOUT configuration in D²PAK :

- 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

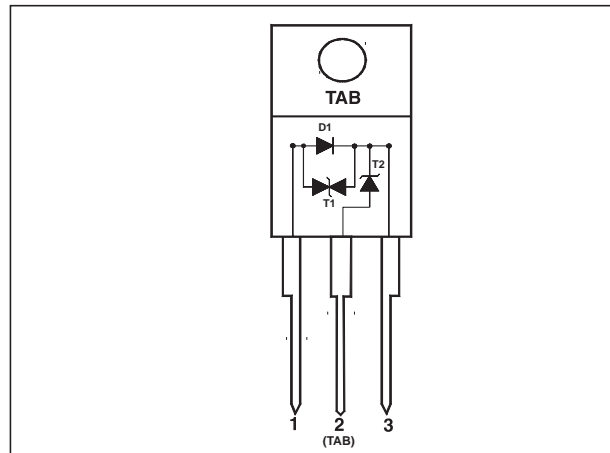


Fig. 1 : Peak pulse power versus exponential pulse duration (T_j initial = 85°C).

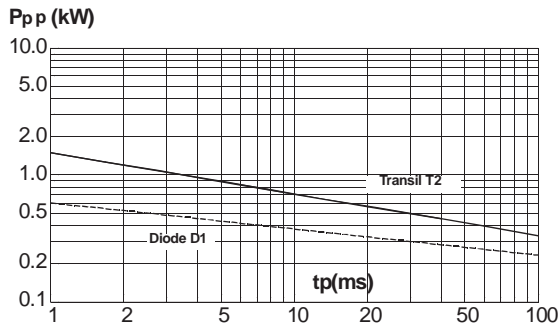


Fig. 2-1 : Clamping voltage versus peak pulse current (T_j initial = 85°C).

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

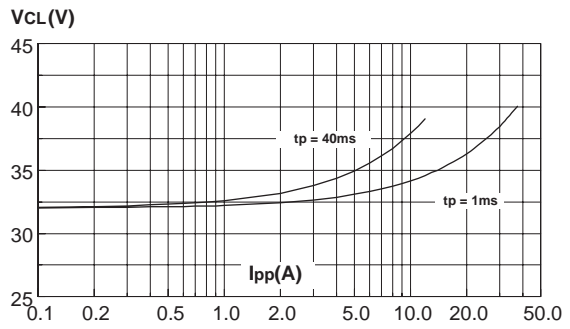


Fig. 2-2 : Clamping voltage versus peak pulse current (T_j initial = 85°C).

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

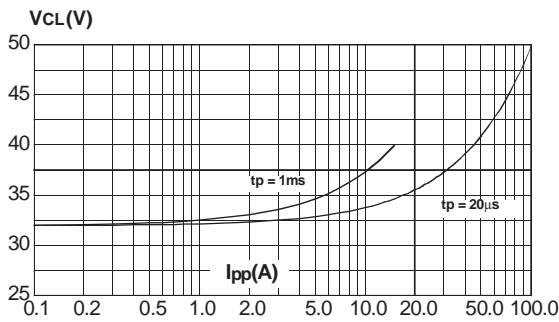


Fig. 3 : Relative variation of peak pulse power versus junction temperature.

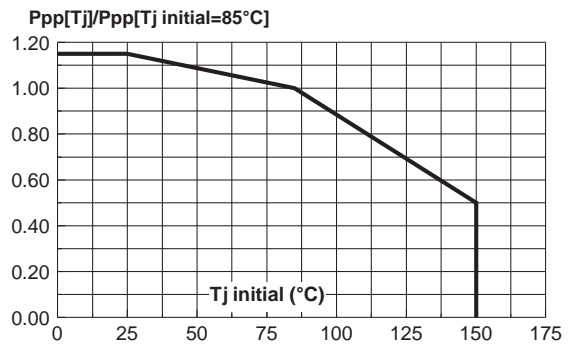


Fig. 4 : Relative variation of thermal impedance junction to case versus pulse duration.

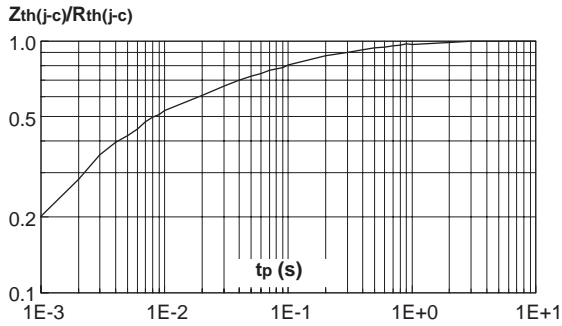


Fig. 5-1 : Peak forward voltage drop versus peak forward current (typical values) - (TRANSIL T2).

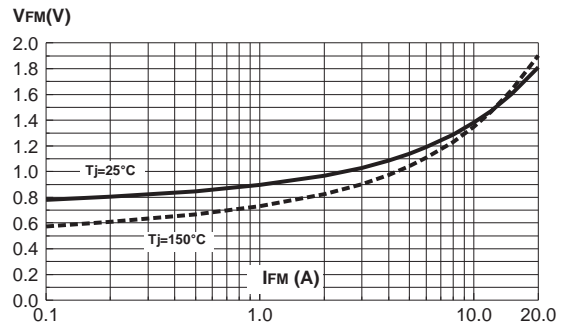


Fig. 5-2 : Peak forward voltage drop versus peak forward current (typical values) - (DIODE D1).

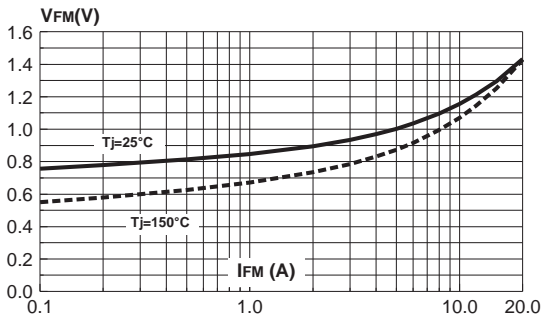
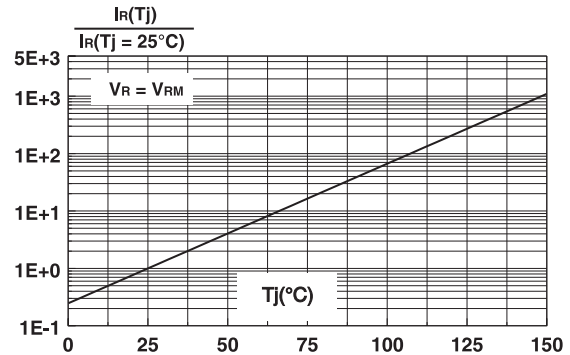
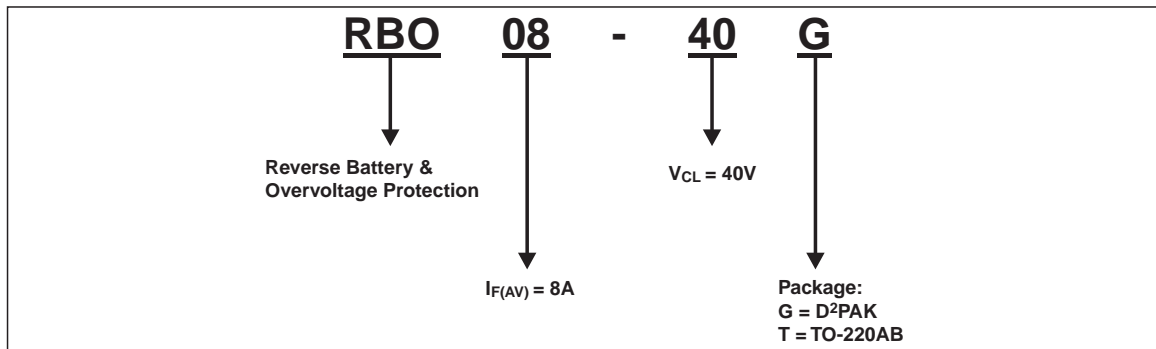


Fig. 6 : Relative variation of leakage current versus junction temperature.



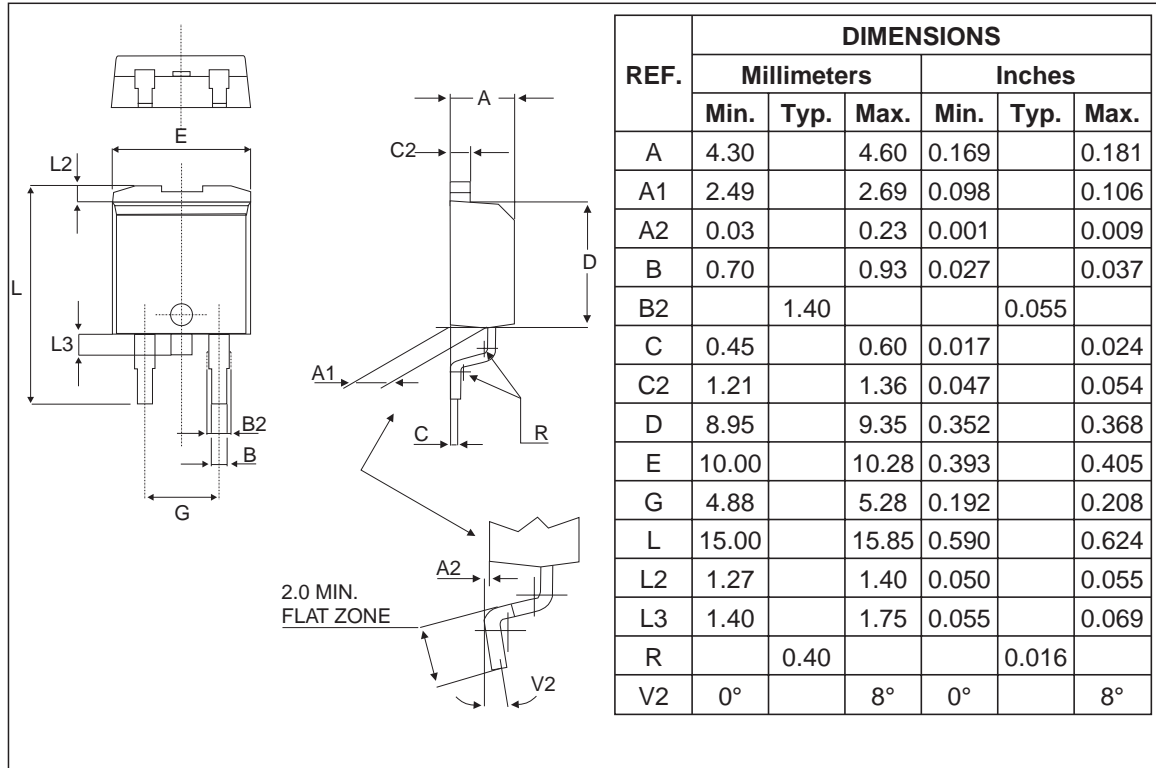
ORDERING INFORMATION



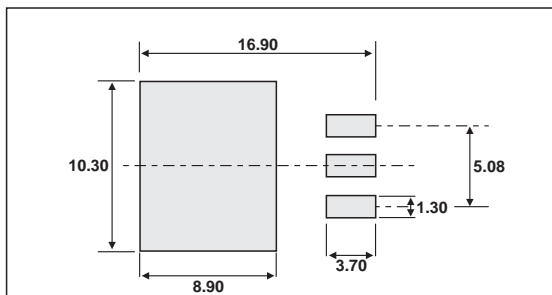
RBO08-40G / RBO08-40T

PACKAGE MECHANICAL DATA

D²PAK Plastic



FOOT-PRINT D²PAK



PACKAGE MECHANICAL DATA

TO-220AB Plastic

REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	14.23	15.87	0.560	0.625
a1		4.50		0.177
a2	12.70	14.70	0.500	0.579
B	10.20	10.45	0.402	0.411
b1	0.64	0.96	0.025	0.038
b2	1.15	1.39	0.045	0.055
C	4.48	4.82	0.176	0.190
c1	0.35	0.65	0.020	0.026
c2	2.10	2.70	0.083	0.106
e	2.29	2.79	0.090	0.110
F	5.85	6.85	0.230	0.270
I	3.55	4.00	0.140	0.157
L	2.54	3.00	0.100	0.118
I2	1.45	1.75	0.057	0.069
I3	0.80	1.20	0.031	0.047

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