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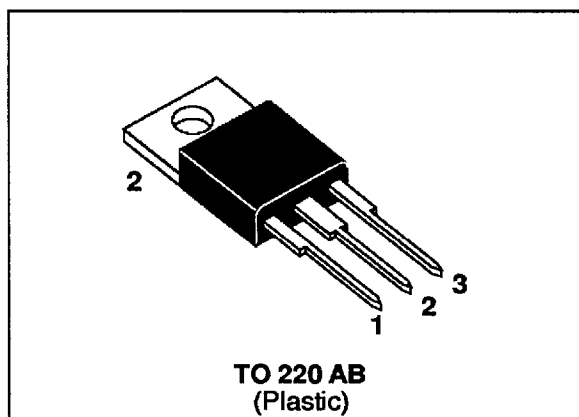
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FEATURES

- PROTECTION AGAINST "LOAD DUMP" EFFECT
- DIODE TO GUARD AGAINST BATTERY REVERSAL
- MONOLITHIC STRUCTURE FOR GREATER RELIABILITY
- NEGATIVE OVERVOLTAGE PROTECTION BY CLAMPING (COMPONENT T1)
- BREAKDOWN VOLTAGE : 24 V min
- CLAMPING VOLTAGE : ± 40 V max
- AVERAGE FORWARD DIODE CURRENT : 40 A

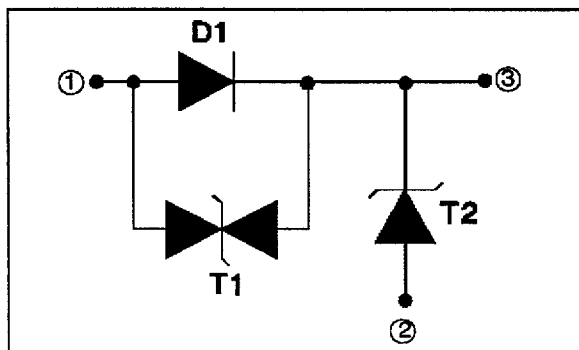

DESCRIPTION

Designed to protect against battery reversal and load dump 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 against "load dump" effect

FUNCTIONAL DIAGRAM

ABSOLUTE MAXIMUM RATINGS (- 40°C < T_{amb} < + 85°C)

Symbol	Parameter		Value	Unit
I _{FSM}	Non repetitive surge peak forward current between pins 1 and 3	t _p = 10μs	400	A
		t _p = 10ms	120	
I _{F(AV)}	Average forward current between pins 1 and 3	T _c = 75°C	40	A
V _{PP}	Peak load dump voltage (see note 1 and 2)		80	V
P _P	Peak pulse power between pins 3 and 1	10/1000μs	1500	W
P	Total power dissipation	T _c = 75°C	75	W
T _{stg} T _J	Storage temperature range Maximum operating junction temperature		- 40 to + 150 150	°C
T _l	Maximum lead temperature for soldering during 10s at 4.5 mm from case		260	°C

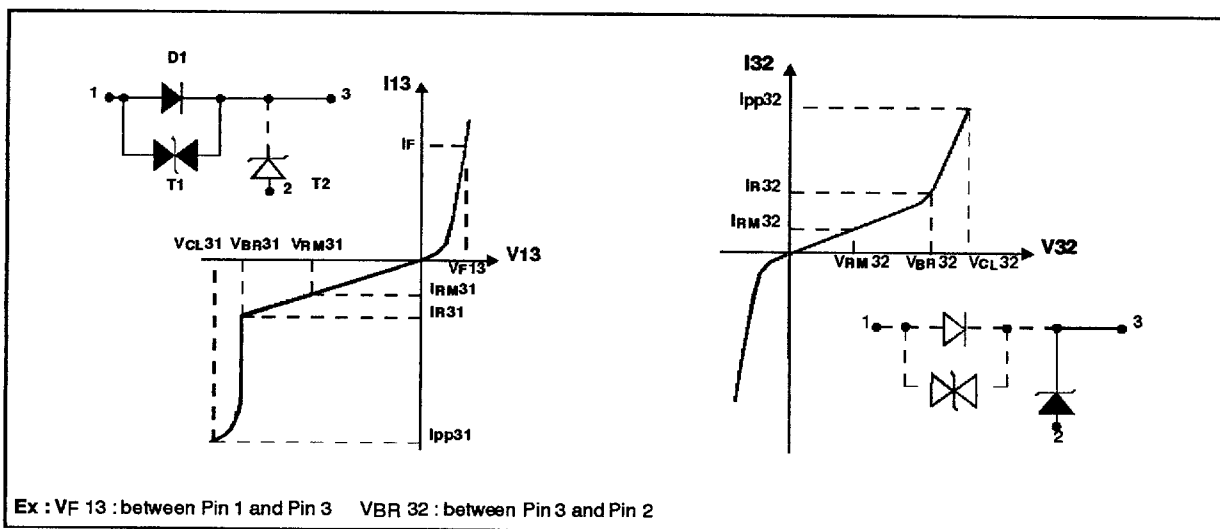
Note 1 : for a surge greater than the maximum value, the device will fail in short circuit.

Note 2 : see load dump test generator circuit (page 3/7)

RBO40-40T

THERMAL RESISTANCES

Symbol	Parameter	Value	Unit
$R_{th(j-c)}$	Junction to case	1	°C/W
$R_{th(j-a)}$	Junction to ambient	60	°C/W



ELECTRICAL CHARACTERISTICS : DIODE D1 (- 40°C < Tamb < + 85°C) (note 1)

Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
V_{F13}	Forward voltage @ $I_F = 40\text{ A}$ $t_p = 380\text{ }\mu\text{s}$			1.9	V
V_{F13}	Forward voltage @ $I_F = 20\text{ A}$ $t_p = 380\text{ }\mu\text{s}$			1.45	V
V_{F13}	Forward voltage @ $I_F = 1\text{ A}$ $t_p = 380\text{ }\mu\text{s}$			1	V
V_{F13}	Forward voltage @ $I_F = 100\text{ mA}$ $t_p = 380\text{ }\mu\text{s}$			0.95	V
C_{13}	Capacitance at 0 V		3000		pF

Note 1 : "13", "31" and "32" suffixes :

ELECTRICAL CHARACTERISTICS : TRANSIL T1 (- 40°C < Tamb < + 85°C) (note 1)

V_{BR31}	Breakdown voltage @ $I_R = 1\text{ mA}$	22		35	V
V_{BR31}	Breakdown voltage @ $I_R = 1\text{ mA}$ $T_{amb} = 25^\circ\text{C}$	24		32	V
I_{RM31}	Leakage current @ $V_{RM} = 20\text{ V}$			300	μA
I_{RM31}	Leakage current @ $V_{RM} = 20\text{ V}$ $T_{amb} = 25^\circ\text{C}$			50	μA
V_{CL31}	Clamping voltage @ $I_{PP} = 37.5\text{ A}$ 10/1000 μs			40	V
α_T	Temperature coefficient		8.5		$10^{-4}/^\circ\text{C}$

Note 1 : "13", "31" and "32" suffixes :

ELECTRICAL CHARACTERISTICS : TRANSIL T2 (- 40°C < Tamb < + 85°C) (note 1)

V _{BR 32}	Breakdown voltage @ I _R = 1 mA	22		35	V
V _{BR 32}	Breakdown voltage @ I _R = 1 mA Tamb = 25°C	24		32	V
I _{RM 32}	Leakage current @ V _{RM} = 20 V			100	μA
I _{RM 32}	Leakage current @ V _{RM} = 20 V Tamb = 25°C			10	μA
V _{CL 32}	Clamping voltage @ IPP = 20 A (note 2)			40	V
α T	Temperature coefficient		8.5		10 ⁻⁴ /°C
C ₃₂	Capacitance at 0 V		8000		pF

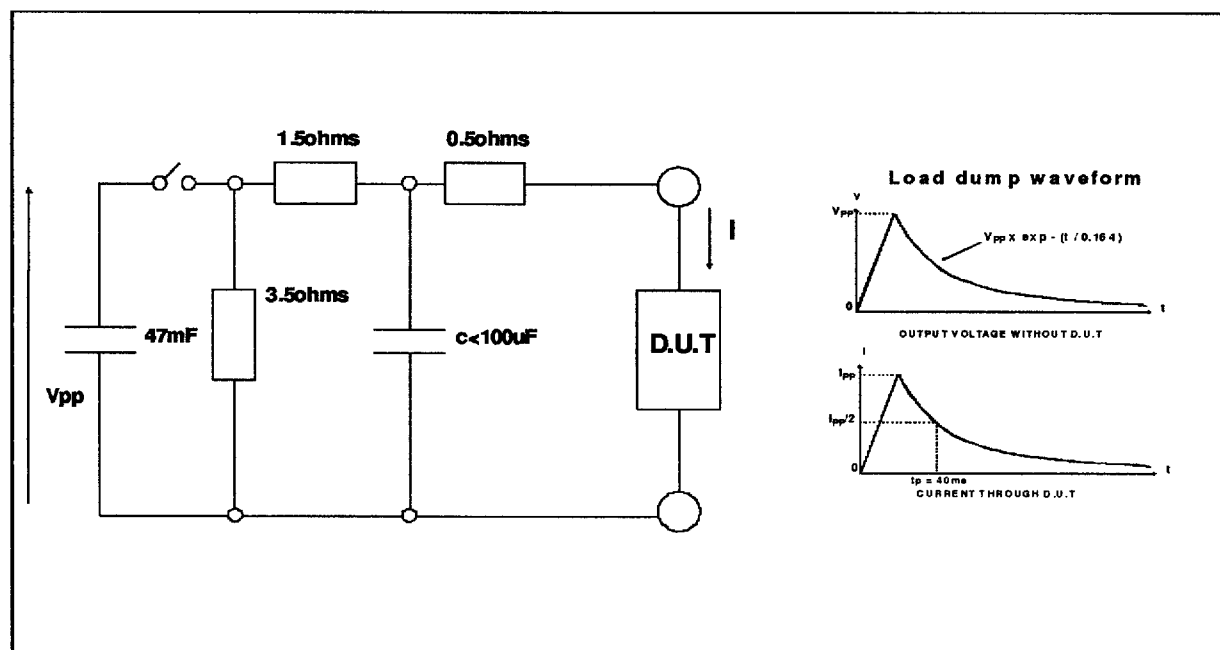
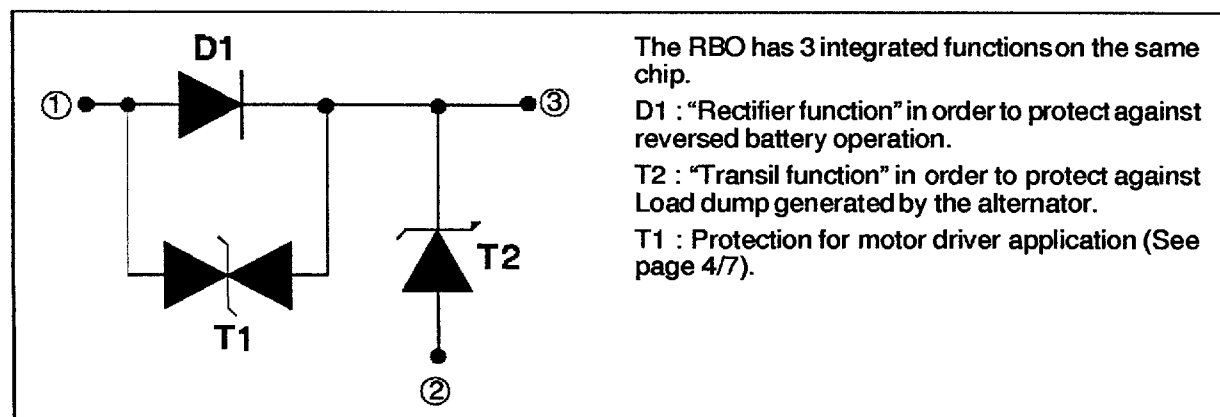
Note 1 : "13", "31" and "32" suffixes :

13 = between pin 1 and pin 3.

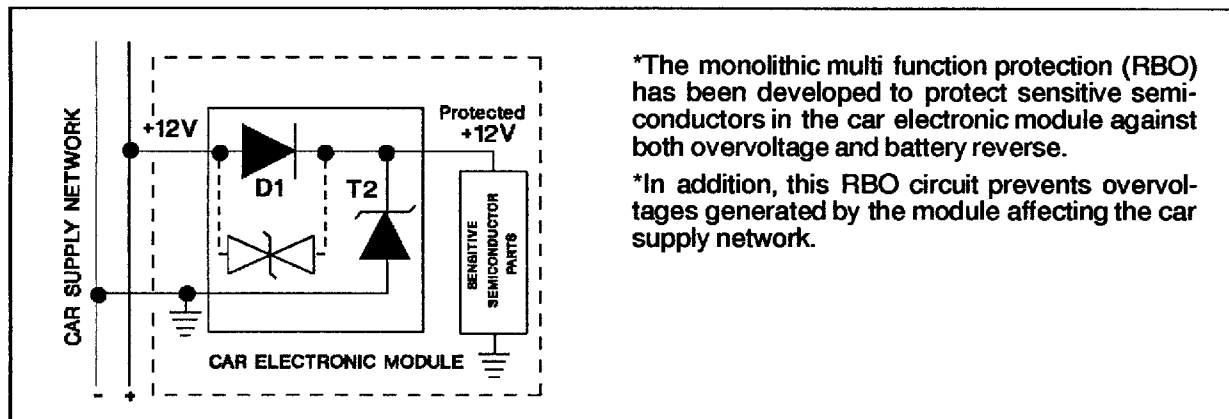
31 = between pin 3 and pin 1.

32 = between pin 3 and pin 2.

Note 2 : see below load dump test generator circuit .

LOAD DUMP TEST GENERATOR CIRCUIT (SCHAFFNER NSG 506C)**PRODUCT DESCRIPTION**

BASIC APPLICATION



MOTOR DRIVER APPLICATION

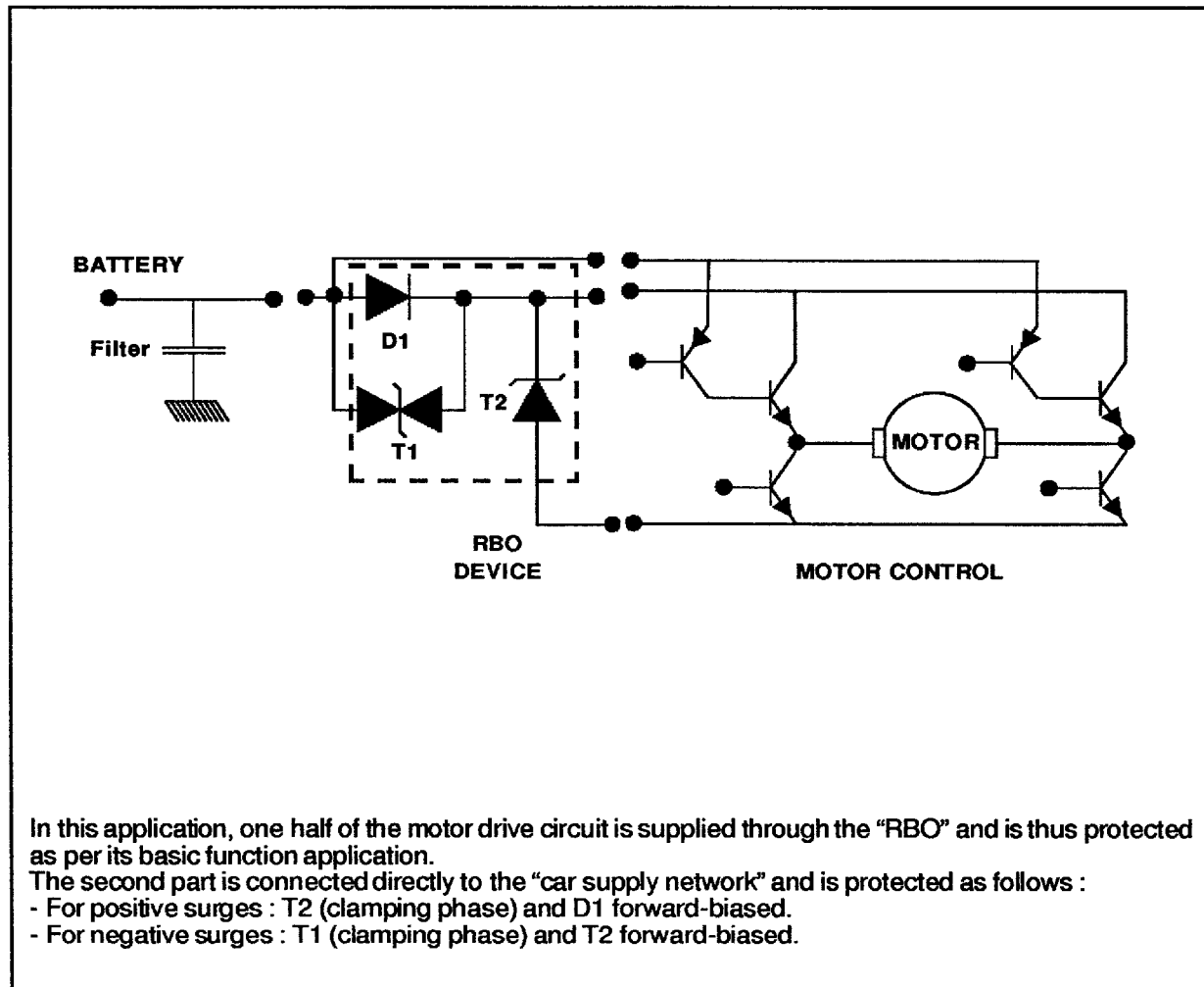


Fig. 1 : Peak pulse power versus exponential pulse duration (T_j initial = 85°C).

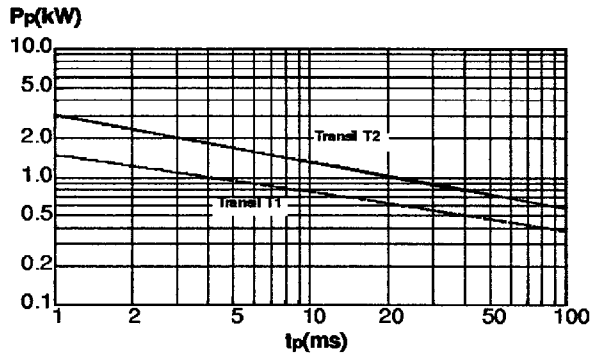


Fig. 2-1 : Clamping voltage versus peak pulse current (T_j initial = 85°C).

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

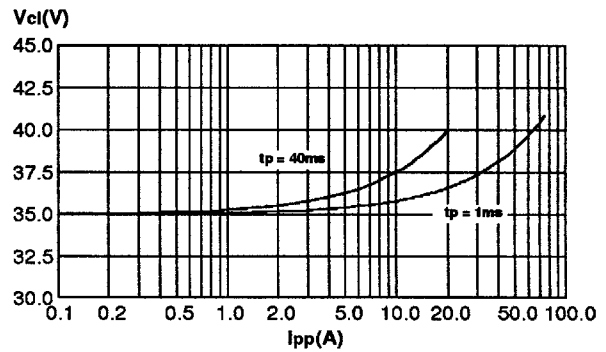


Fig. 2-2 : Clamping voltage versus peak pulse current (T_j initial = 85°C).

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

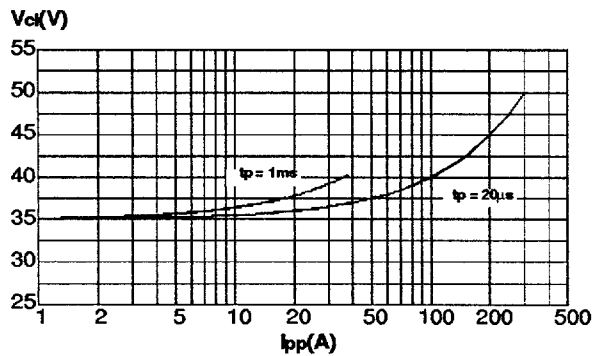


Fig. 3 : Relative variation of peak pulse power versus junction temperature.

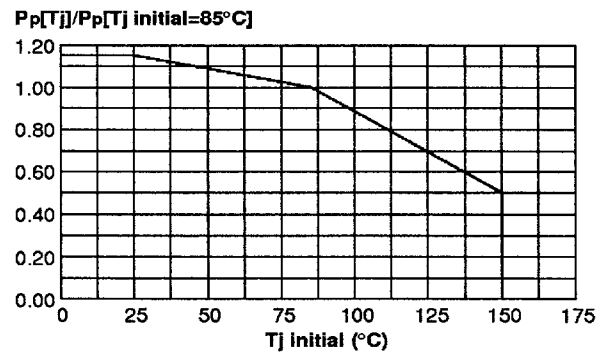


Fig. 4 : Relative variation of thermal impedance junction to case versus pulse duration.

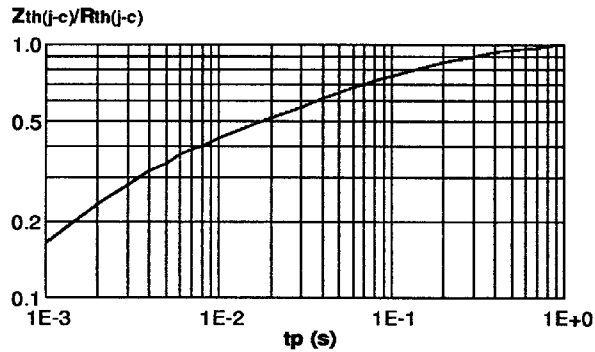


Fig. 5-1 : Peak forward voltage drop versus peak forward current (typical values) - (TRANSIL T2).

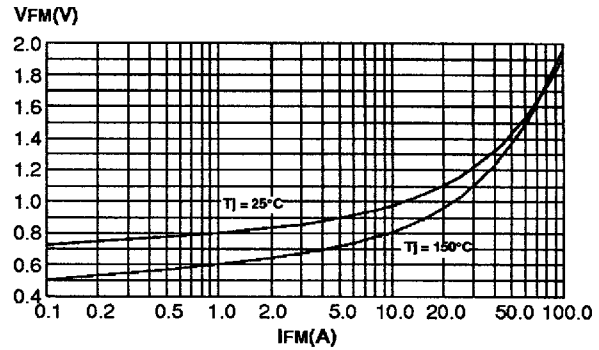
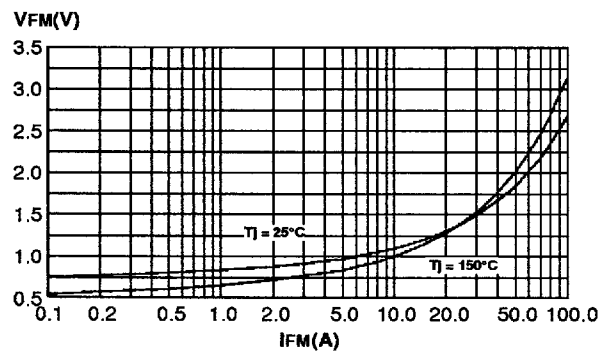
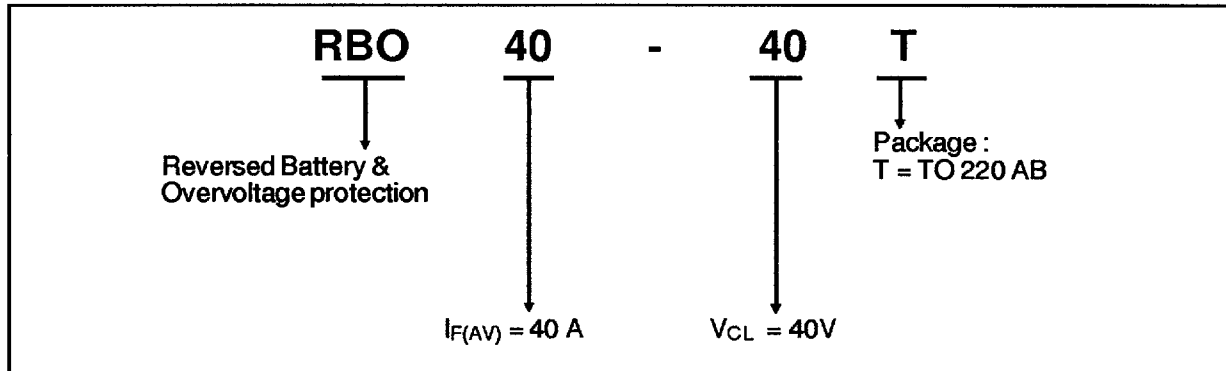


Fig. 5-2 : Peak forward voltage drop versus peak forward current (typical values) - (DIODE D1).



ORDERING INFORMATION


PACKAGE MECHANICAL DATA
 TO220AB Plastic

REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	10.20	10.50	0.401	0.413
B	14.23	15.87	0.560	0.625
C	12.70	14.70	0.500	0.579
D	5.85	6.85	0.230	0.270
F		4.50		0.178
G	2.54	3.00	0.100	0.119
H	4.48	4.82	0.176	0.190
I	3.55	4.00	0.140	0.158
J	1.15	1.39	0.045	0.055
L	0.35	0.65	0.013	0.026
M	2.10	2.70	0.082	0.107
N	4.58	5.58	0.18	0.22
O	0.80	1.20	0.031	0.048
P	0.64	0.96	0.025	0.038

Cooling method : C
 Marking : type number
 Weight : 2 g
 Polarity : N A
 Stud torque : N A

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