Bulletin PD-2.318 rev. D 05/04

International
IOR Rectifier

MBR15..CT
MBRB15..CT
MBR15..CT-1

SCHOTTKY RECTIFIER

15 Amp

Major Ratings and Characteristics

Characteristics	MBR15..CT	Units
$I_{F(AV)}$ Rectangular waveform	15	A
V_{RRM}	35/45	V
I_{FSM} @ tp = 5 µs sine	690	A
V_F @7.5 Apk, T_J = 125°C	0.57	V
T_J	- 65 to 150	°C

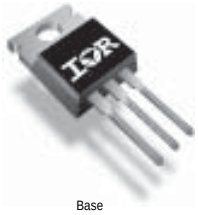
Description/ Features

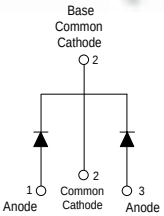
The MBR15..CT center tap Schottky rectifier has been optimized for low reverse leakage at high temperature. The proprietary barrier technology allows for reliable operation up to 150° C junction temperature. Typical applications are in switching power supplies, converters, free-wheeling diodes, and reverse battery protection.

- 150° C T_J operation
- Center tap TO-220 package
- Low forward voltage drop
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability

Case Styles

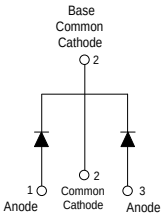
MBR15..CT





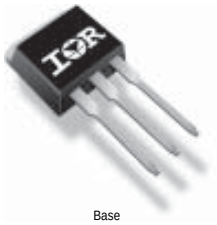
TO-220

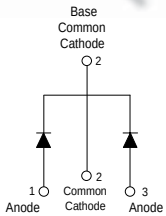
MBRB15..CT



D^2PAK

MBR15..CT-1





TO-262

Voltage Ratings

Parameters		MBR1535CT MBRB1535CT MBR1535CT-1	MBR1545CT MBRB1545CT MBR1545CT-1
V_R	Max. DC Reverse Voltage (V)	35	45
V_{RWM}	Max. Working Peak Reverse Voltage (V)		

Absolute Maximum Ratings

	Parameters	Value	Units	Conditions	
$I_{F(AV)}$	Max. Aver. Forward Current (Per Leg)	7.5	A	@ T_C = 131 °C (Rated V_R)	
	(Per Device)	15			
I_{FSM}	Max. Peak One Cycle Non Repetitive Surge	690	A	5µs Sine or 3µs Rect. pulse	Following any rated load condition and with rated V_{RRM} applied
		150		Surge applied at rated load condition halfwave single phase 60Hz	
E_{AS}	Non-Repetitive Avalanche Energy	7	mJ	(Per Leg) T_J = 25 °C, I_{AS} = 2 Amps, L = 3.5 mH	
I_{AR}	Repetitive Avalanche Current (Per Leg)	2	A	Current decaying linearly to zero in 1 µsec Frequency limited by T_J max. V_A = 1.5 x V_R typical	

Electrical Specifications

	Parameters	Value	Units	Conditions	
V_{FM}	Max. Forward Voltage Drop (1)	0.84	V	@ 15A	T_J = 25 °C
		0.57	V	@ 7.5A	T_J = 125 °C
		0.72	V	@ 15A	
I_{RM}	Max. Instantaneus Reverse Current (1)	0.1	mA	T_J = 25 °C	Rated DC voltage
		15	mA	T_J = 125 °C	
C_T	Max. Junction Capacitance	400	pF	V_R = 5V_{DC} (test signal range 100Khz to 1Mhz) 25°C	
L_S	Typical Series Inductance	8.0	nH	Measured from top of terminal to mounting plane	
dv/dt	Max. Voltage Rate of Change (Rated V_R)	10000	V/ µs		

(1) Pulse Width < 300µs, Duty Cycle <2%

Thermal-Mechanical Specifications

	Parameters		Value	Units	Conditions
T_J	Max. Junction Temperature Range		-65 to 150	°C	
T_{stg}	Max. Storage Temperature Range		-65 to 175	°C	
R_{thJC}	Max. Thermal Resistance Junction to Case (Per Leg)		3.0	°C/W	DC operation
R_{thCS}	Typical Thermal Resistance, Case to Heatsink		0.50	°C/W	Mounting surface, smooth and greased
R_{thJA}	Max. Thermal Resistance Junction		60	°C/W	DC operation
wt	Approximate Weight		2 (0.07)	g (oz.)	
T	Mounting Torque	Min.	6 (5)	Kg-cm (lbf-in)	
		Max.	12 (10)		
	Device Marking		MBR15..CT		Case style TO-220
			MBRB15..CT		Case style D^2Pak
			MBR15..CT-1		Case style TO-262

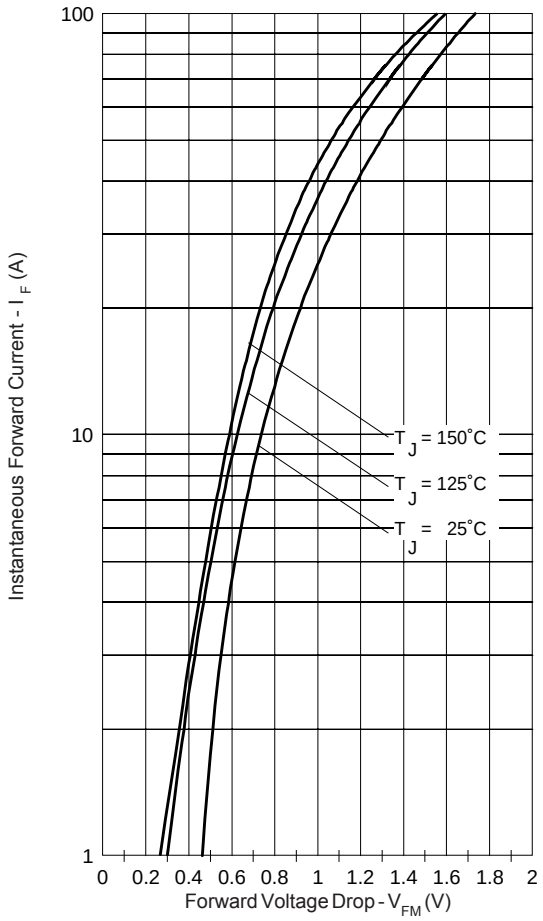


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

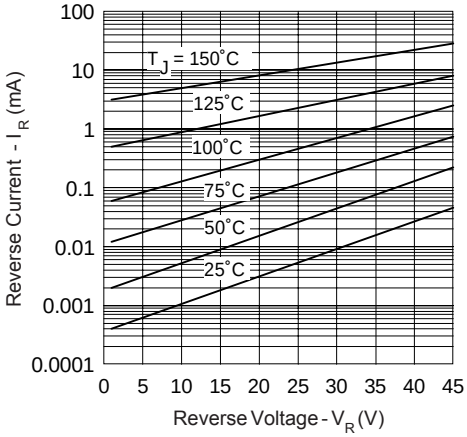


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

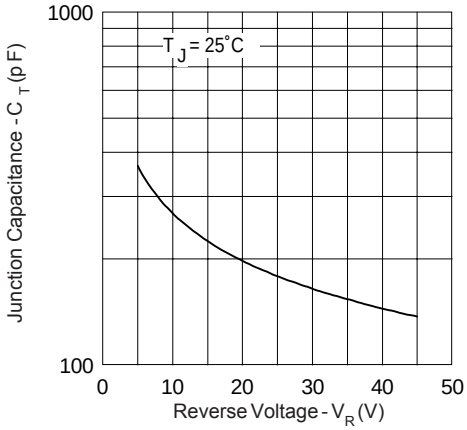


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

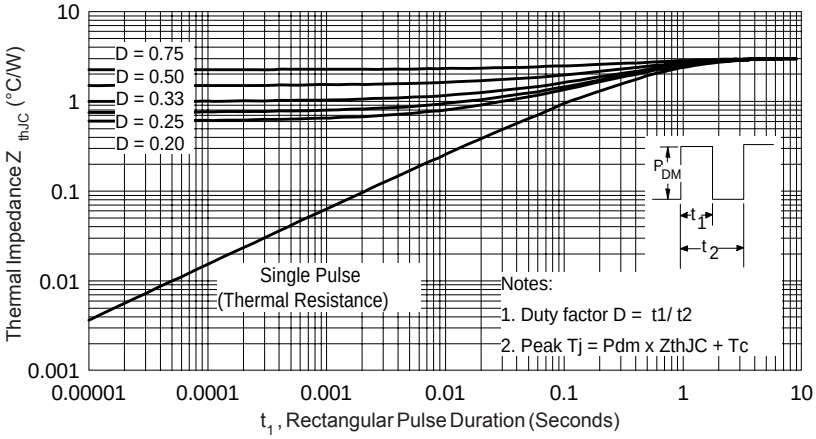


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (Per Leg)

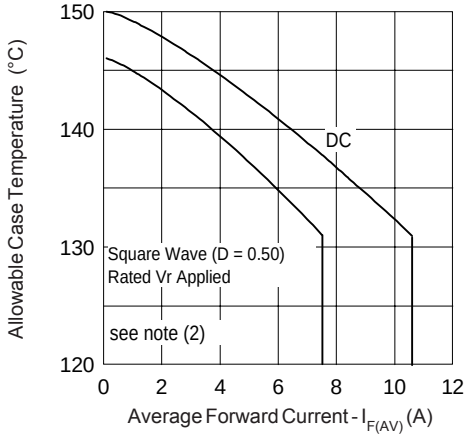


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current

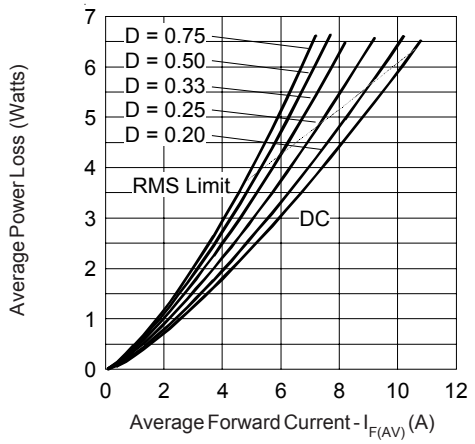


Fig. 6 - Forward Power Loss Characteristics

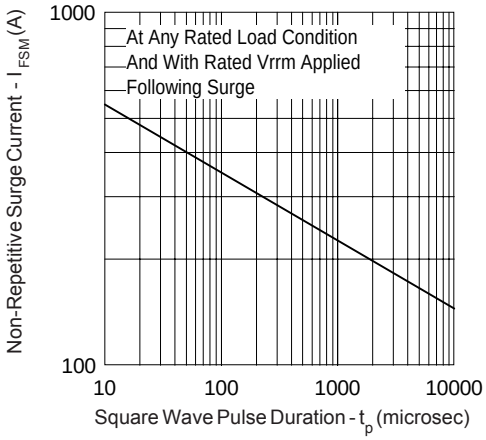
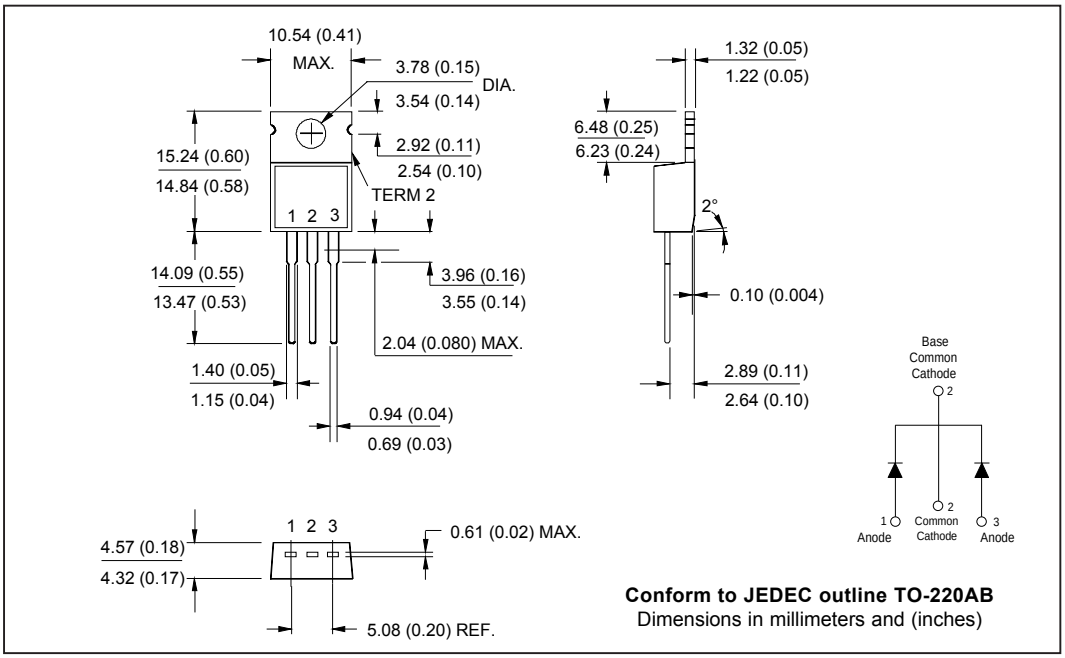


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

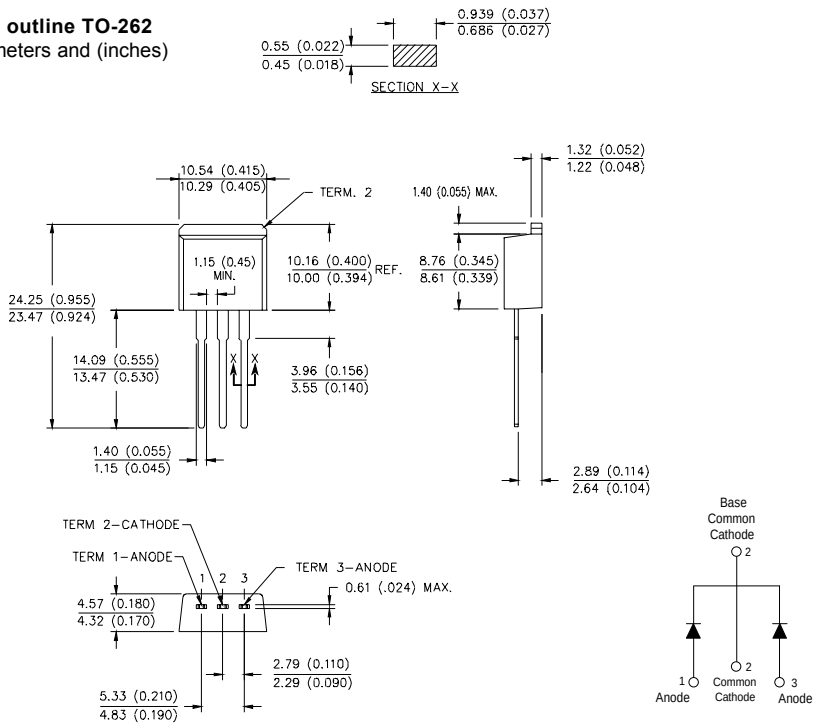
(2) Formula used: $T_C = T_J - (Pd + Pd_{REV}) \times R_{thJC}$;
Pd = Forward Power Loss = $I_{F(AV)} \times V_{FM} @ (I_{F(AV)} / D)$ (see Fig. 6);
Pd_{REV} = Inverse Power Loss = $V_{R1} \times I_R (1 - D)$; $I_R @ V_{R1}$ = rated V_R

Outline Table

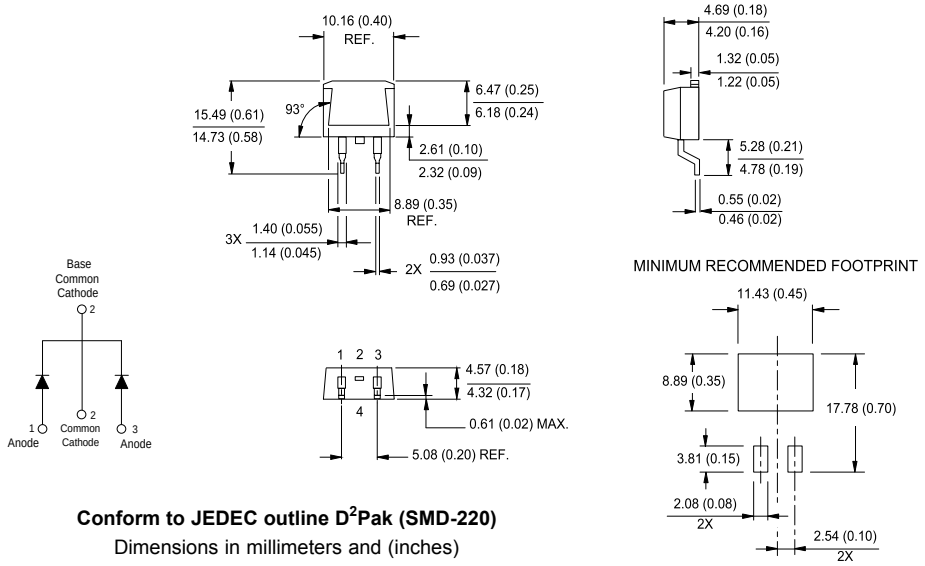


Conform to JEDEC outline TO-220AB
Dimensions in millimeters and (inches)

Modified JEDEC outline TO-262
Dimensions in millimeters and (inches)

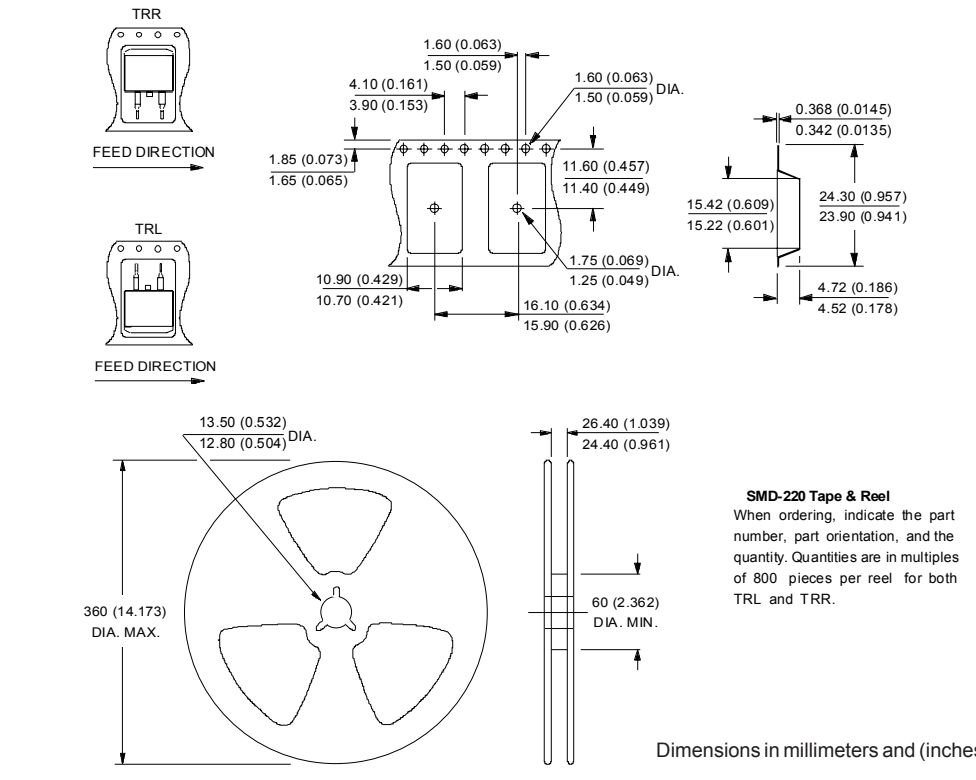


Outline Table



Conform to JEDEC outline D^2Pak (SMD-220)
Dimensions in millimeters and (inches)

Tape & Reel Information

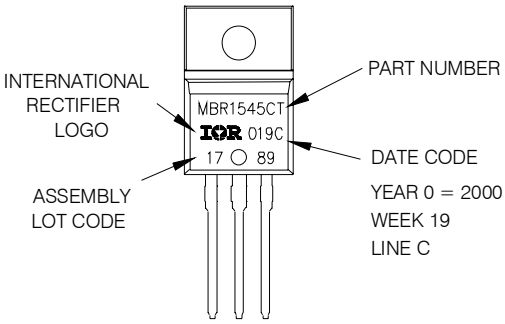


SMD-220 Tape & Reel
When ordering, indicate the part number, part orientation, and the quantity. Quantities are in multiples of 800 pieces per reel for both TRL and TRR.

Dimensions in millimeters and (inches)

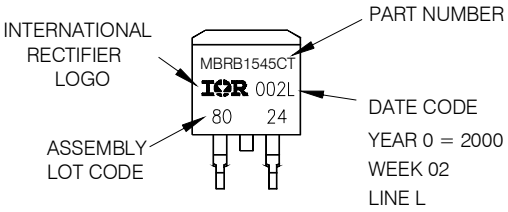
Part Marking Information

EXAMPLE: THIS IS A MBR1545CT
LOT CODE 1789
ASSEMBLED ON WW 19, 2000
IN THE ASSEMBLY LINE "C"



TO-220

EXAMPLE: THIS IS A MBRB1545CT
LOT CODE 8024
ASSEMBLED ON WW 02, 2000
IN THE ASSEMBLY LINE "L"



D^2PAK

EXAMPLE: THIS IS A MBR1545CT-1
LOT CODE 1789
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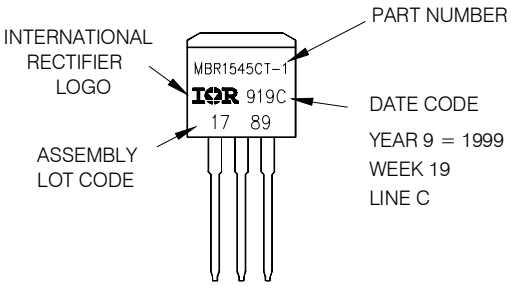
IN THE ASSEMBLY LINE "C"



TO-262

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MBR1545CT
*****************************************
*      This model has been developed by    *
*     Wizard SPICE MODEL GENERATOR (1999)  *
*   (International Rectifier Corporation)  *
*   contains Proprietary Information       *
*****************************************
* SPICE Model Diode is composed by a       *
* simple diode plus paralled VCG2T         *
*****************************************
.SUBCKT MBR1545 ANO CAT
D1 ANO 1 DMOD (0.03191)
*Define diode model
.MODEL DMOD D(IS=9.72464638473799E-05A,N=1.30648926537753,BV=52V,
+ IBV=0.195508065728349A,RS= 0.000727548,CJO=1.94829876431799E-08,
+ VJ=2.27282978121533,XTI=2, EG=0.854458710837653)
*****************************************
*Implementation of VCG2T
VX 1 2 DC 0V
R1 2 CAT TRES 1E-6
.MODEL TRES RES(R=1,TC1=27.6281424524011)
GP1 ANO CAT VALUE={-ABS(I(VX))*(EXP((((-5.219758E-03/27.62814)*((V(2,CAT)*1E6)/
(I(VX)+1E-6)-1))+1)*7.000165E-02*ABS(V(ANO,CAT)))-1)}
*****************************************
.ENDS MBR1545



Thermal Model Subcircuit
.SUBCKT MBR1545  5 1

CTHERM1     5    4     1.05E+00
CTHERM2     4    3     4.44E+00
CTHERM3     3    2     1.16E+01
CTHERM4     2    1     6.12E+01

RTHERM1     5    4     1.33E+00
RTHERM2     4    3     1.19E+00
RTHERM1     3    2     3.81E-01
RTHERM1     2    1     9.54E-02


.ENDS MBR1545
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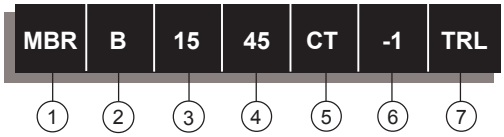
Ordering Information Table

Device Code



1 - Essential Part Number
2 - B = D^2Pak only
3 - Current Rating (15 = 15A)
4 - Voltage Rating
    35 = 35V
    45 = 45V
5 - CT = Essential Part Number
6 - " -1 " =TO-262 only
7 - • none =Tube (50 pieces)
    • TRL =Tape & Reel (Left Oriented - for D^2Pak only)
    • TRR =Tape & Reel (Right Oriented - for D^2Pak only)

Data and specifications subject to change without notice.
This product has been designed and qualified for Industrial Level.
Qualification Standards can be found on IR's Web site.

International
IOR Rectifier

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