



### Voltage Ratings

Part number	MBRD320	MBRD330	MBRD340
$V_R$ Max. DC Reverse Voltage (V)	20	30	40
$V_{RWM}$ Max. Working Peak Reverse Voltage (V)			

### Absolute Maximum Ratings

Parameters	Value	Units	Conditions
$I_{F(AV)}$ Max. Average Forward Current	3.0	A	50% duty cycle @ $T_L = 133^\circ\text{C}$ , rectangular wave form
$I_{FSM}$ Max. Peak One Cycle Non-Repetitive Surge Current	490 75		5 $\mu\text{s}$ Sine or 3 $\mu\text{s}$ Rect. pulse 10ms Sine or 6ms Rect. pulse
$E_{AS}$ Non Repetitive Avalanche Energy	8.0	mJ	$T_J = 25^\circ\text{C}$ , $I_{AS} = 1\text{Amp}$ , $L = 16\text{mH}$
$I_{AR}$ Repetitive Avalanche Current	1.0	A	Current decaying linearly to zero in 1 $\mu\text{sec}$ Frequency limited by $T_J$ max. $V_a = 1.5 \times V_r$ typical

### Electrical Specifications

Parameters	Typ.	Max.	Units	Conditions
$V_{FM}$ Max. Forward Voltage Drop (1) See Fig. 1	0.48	0.6	V	@ 3A
	0.58	0.7	V	@ 6A
	0.41	0.49	V	@ 3A
	0.55	0.625	V	@ 6A
$I_{RM}$ Max. Reverse Leakage Current (1) See Fig. 2	0.02	0.2	mA	$T_J = 25^\circ\text{C}$
	10.7	20	mA	$T_J = 125^\circ\text{C}$
$C_T$ Typical Junction Capacitance	189	-	pF	$V_R = 5V_{DC}$ (test signal range 100kHz to 1Mhz), @ $25^\circ\text{C}$
$L_S$ Typical Series Inductance	5.0	-	nH	Measured lead to lead 5mm from package body
dv/dt Max. Voltage Rate of Change	-	10000	V/ $\mu\text{s}$	(Rated $V_R$ )

(1) Pulse Width < 300 $\mu\text{s}$ , Duty Cycle <2%

### Thermal-Mechanical Specifications

Parameters	Value	Units	Conditions
$T_J$ Max. Junction Temperature Range (*)	-40 to 150	$^\circ\text{C}$	
$T_{stg}$ Max. Storage Temperature Range	-40 to 175	$^\circ\text{C}$	
$R_{thJC}$ Max. Thermal Resistance Junction to Case	6.0	$^\circ\text{C/W}$	DC operation * See Fig. 4
$R_{thJA}$ Max. Thermal Resistance Junction to Ambient	80	$^\circ\text{C/W}$	
wt Approximate Weight	0.3(0.01)	g(oz.)	
Case Style	D-PAK		Similar to TO-252AA

(\*)  $\frac{dP_{tot}}{dT_J} < \frac{1}{R_{th(j-a)}}$  thermal runaway condition for a diode on its own heatsink

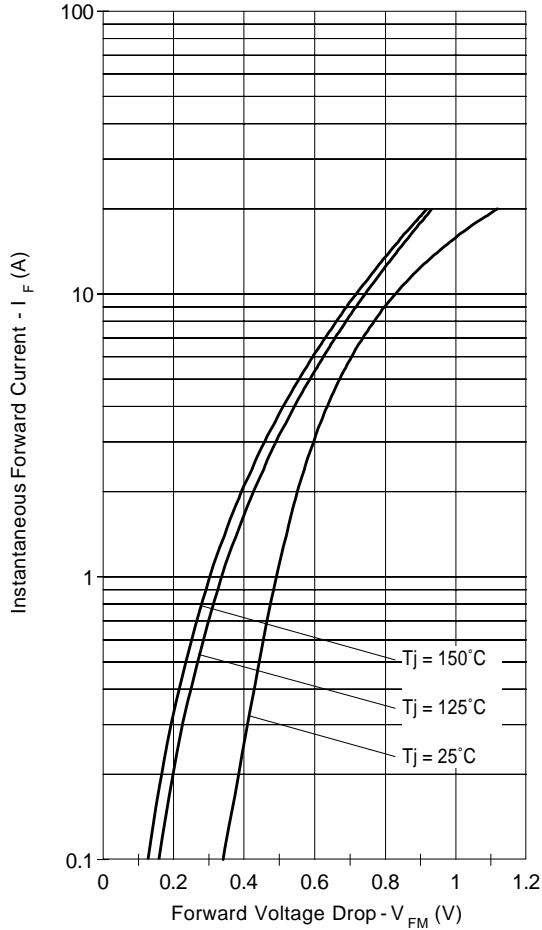


Fig. 1 - Maximum Forward Voltage Drop Characteristics

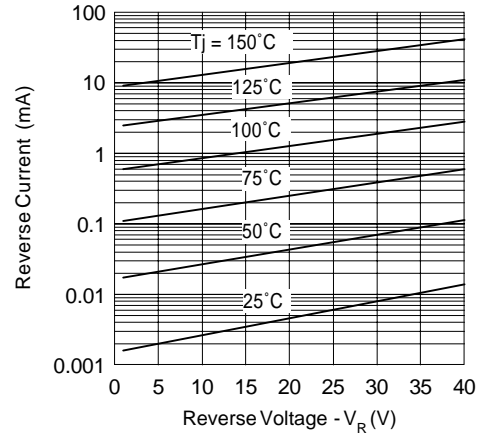


Fig. 2 - Typical Values of Reverse Current Vs. Reverse Voltage

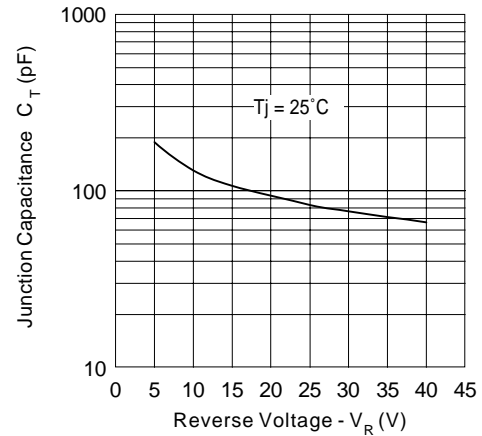


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

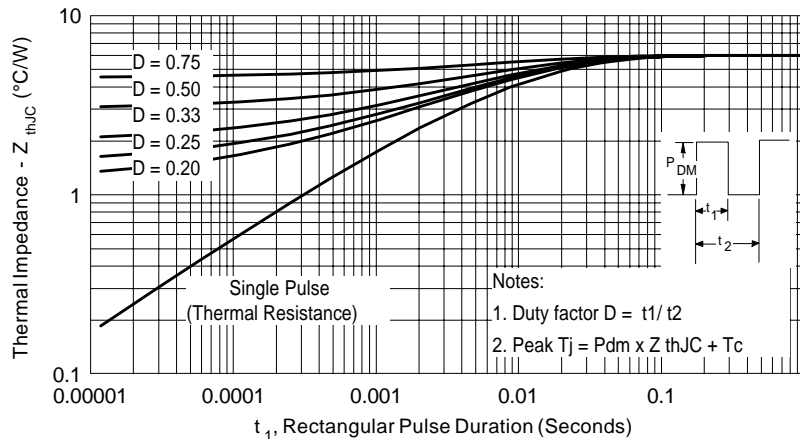


Fig. 4 - Maximum Thermal Impedance  $Z_{thJC}$  Characteristics

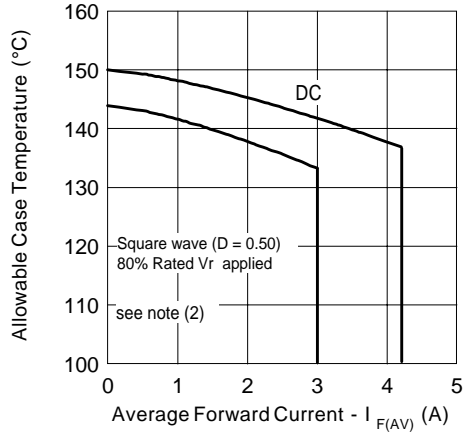


Fig. 5 - Maximum Allowable Case Temperature Vs. Average Forward Current

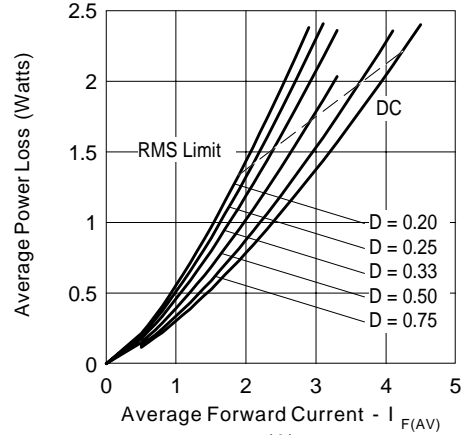


Fig. 6 - Forward Power Loss Characteristics

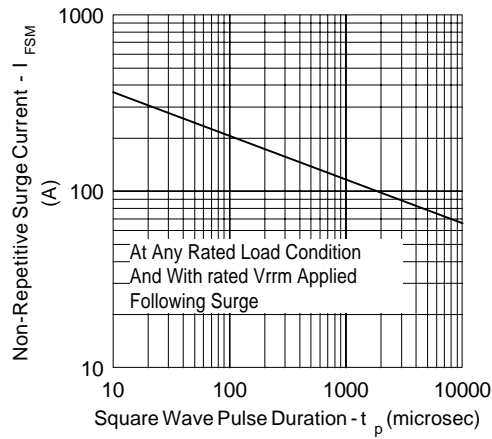


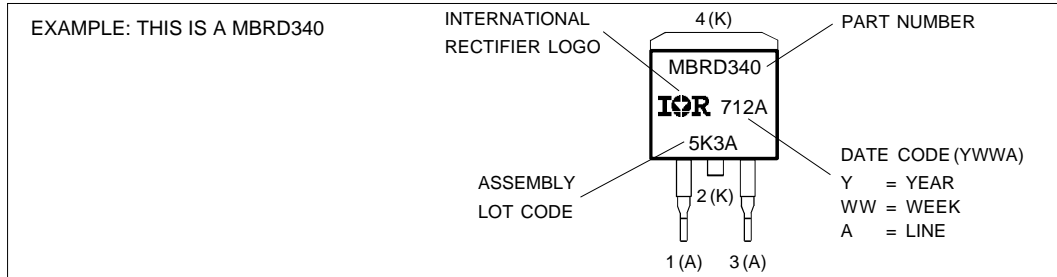
Fig. 7 - Maximum Non-Repetitive Surge Current

(2) Formula used:  $T_C = T_J - (P_d + P_{d_{REV}}) \times R_{thJC}$ ;

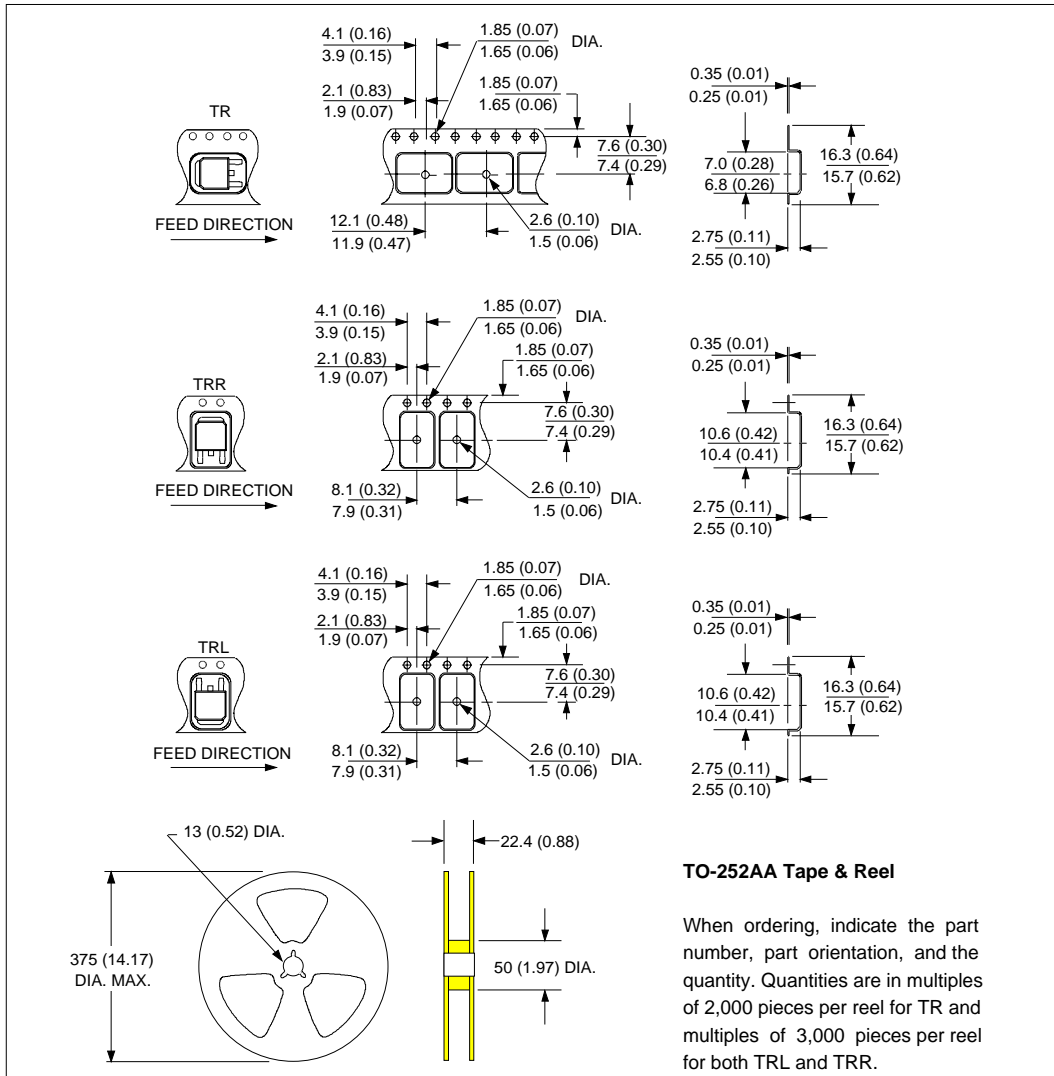
$P_d$  = Forward Power Loss =  $I_{F(AV)} \times V_{FM} @ (I_{F(AV)} / D)$  (see Fig. 6);

$P_{d_{REV}}$  = Inverse Power Loss =  $V_{R1} \times I_R (1 - D)$ ;  $I_R @ V_{R1} = 80\%$  rated  $V_R$

Marking Information



Tape & Reel Information



MBRD320, MBRD330, MBRD340

Bulletin PD-20756 rev. D 03/03

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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.

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