SWITCHMODE Power Rectifiers

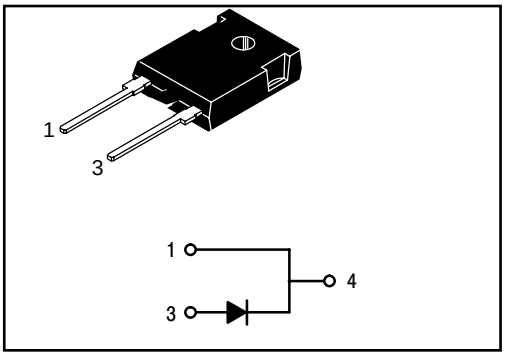
ULTRAFAST RECTIFIERS
50 AMPERES, 200−600 VOLTS

ADVANTAGES
* High reliability circuit operation
* Low voltage peaks for reduced protection circuits
* Low noise switching
* Low losses
* Operating at lower temperature or space saving by reduced cooling

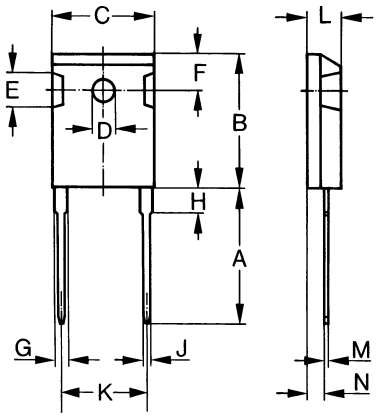
FEATURES
* International standard package JEDEC TO-247AD-2P
* Planar passivatd chips
* Very short recovery time
* Extremely low switching losses
* Low I_{RM}-values
* Soft recovery behaviour

APPLICATIONS
* Antiparallel diode for high frequency switching devices
* Antisaturation diode
* Snubber diode
* Free wheeling diode in converters and motor control circuits
* Rectifiers in switch mode power supplies (SMPS)
* Inductive heating and melting
* Uninterruptible power supplies (UPS)
* Ultrasonic cleaners and welders

TO-247AD-2P Unit : inch (mm)



Dimensions TO-247AD-2P



Dim.	Millimeter Min.	Max.	Inches Min.	Max.
A	19.81	20.32	0.780	0.800
B	20.80	21.46	0.819	0.845
C	15.75	16.26	0.610	0.640
D	3.55	3.65	0.140	0.144
E	4.32	5.49	0.170	0.216
F	5.4	6.2	0.212	0.244
G	1.65	2.13	0.065	0.084
H	-	4.5	-	0.177
J	1.0	1.4	0.040	0.055
K	10.8	11.0	0.426	0.433
L	4.7	5.3	0.185	0.209
M	0.4	0.8	0.016	0.031
N	1.5	2.49	0.087	0.102

Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

1. Pulse Test: Pulse Width = 300 μs, Duty Cycle ≤ 2.0%.

MAXIMUM RATINGS (Per Leg)

Rating	Symbol	MUR50A20P	MUR50A40P	MUR50A60P	Unit
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	V_{RRM} V_{RWM} V_R	200	400	600	V
Average Rectified Forward Current (Rated V_R)	$I_{F(AV)}$	50			A
Peak Rectified Forward Current, Per Leg (Rated V_R, Square Wave, 20 kHz, T_C = 150°C)	I_{FRM}	50 @ T_C = 150°C		50 @ T_C =145°C	A
Nonrepetitive Peak Surge Current (Surge applied at rated load conditions, halfwave, single phase, 60 Hz) Per Leg	I_{FSM}	600			A
Operating Junction and Storage Temperature	T_J, T_{stg}	− 65 to +175			°C

THERMAL CHARACTERISTICS (Per Diode Leg)

Maximum Thermal Resistance, − Junction−to−Case − Junction−to−Ambient	 $R_{\theta JC}$ $R_{\theta JA}$	 1.5 40			°C/W

ELECTRICAL CHARACTERISTICS (Per Diode Leg)

Maximum Instantaneous Forward Voltage (Note 1) (I_F = 50 Amp, T_C = 150°C) (I_F = 50 Amp, T_C = 25°C)	V_F	 0.95 1.05	 1.20 1.30	 1.5 1.7	V
Maximum Instantaneous Reverse Current (Note 1) (Rated DC Voltage, T_J = 150°C) (Rated DC Voltage, T_J = 25°C)	i_R	 5000 60		 5000 60	μA
Maximum Reverse Recovery Time (i_F = 1.0 A, di/dt = 50 A/μs)	t_{rr}	35	50		ns

Ultra Fast Recovery Diodes

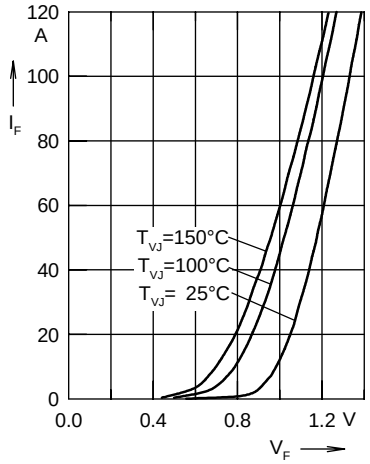


Fig. 1 Forward current I_F versus V_F

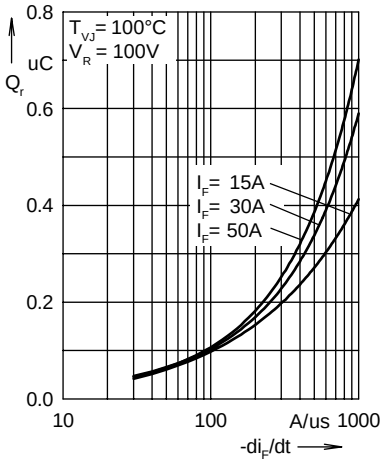


Fig. 2 Typ. reverse recovery charge Q_r versus -di$_F$/dt

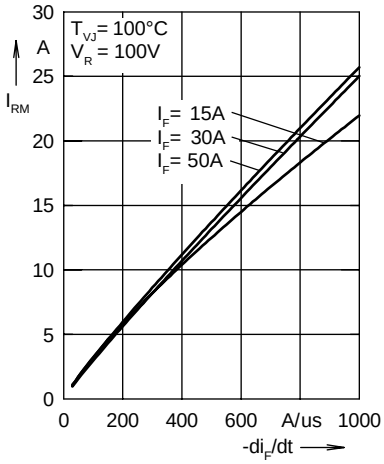


Fig. 3 Typ. peak reverse current I_{RM} versus -di$_F$/dt

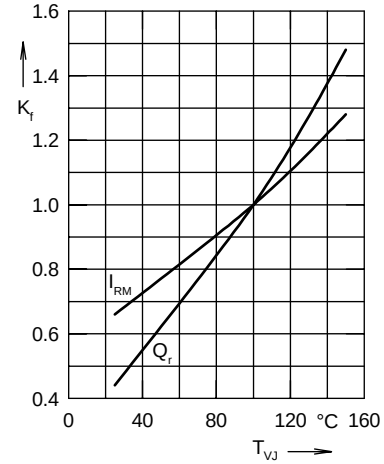


Fig. 4 Dynamic parameters Q_r, I_{RM} versus T_{VJ}

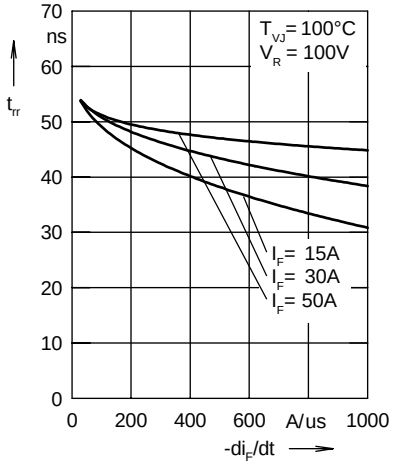


Fig. 5 Typ. recovery time t_{rr} versus -di$_F$/dt

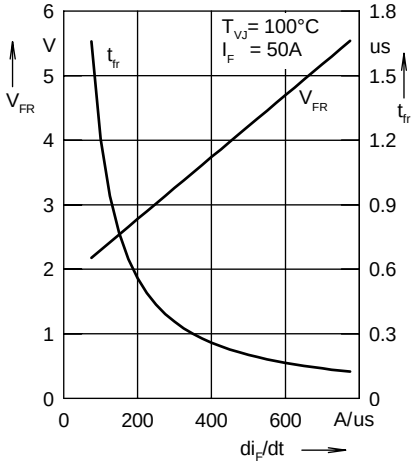


Fig. 6 Typ. peak forward voltage V_{FR} and t_{fr} versus di$_F$/dt

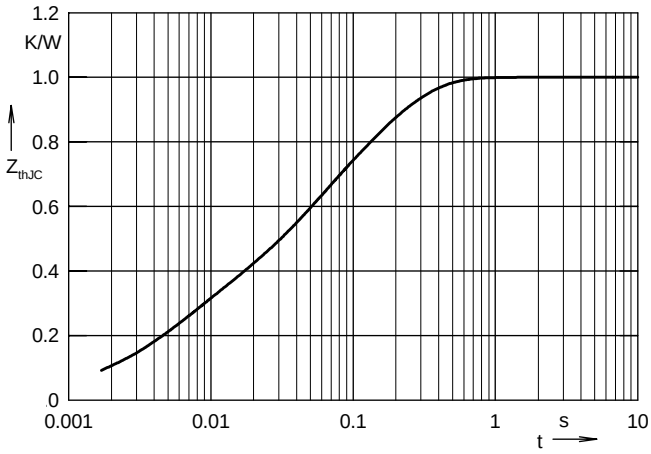


Fig. 7 Transient thermal impedance junction to case