TV30

Rectifier Diode

Replaces November 1999 version, DS4086-3.0

DS4086-4.0 January 2000

APPLICATIONS

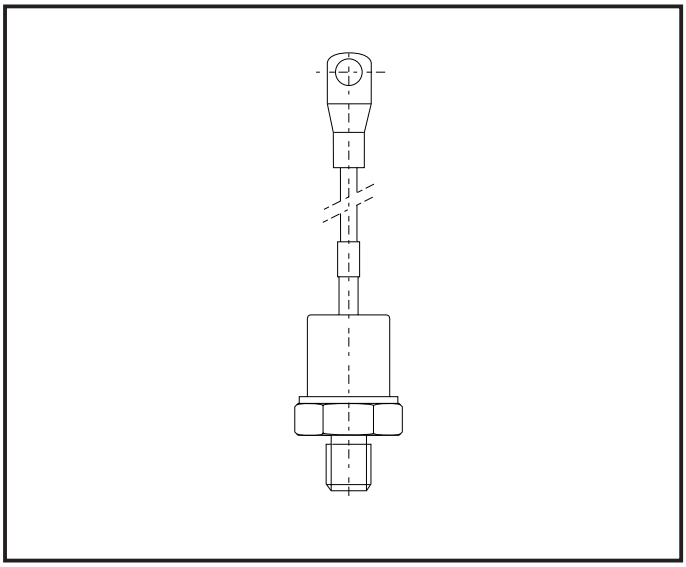
- Rectification
- Freewheel Diode
- DC Motor Control
- Power Supplies
- Welding
- Battery Chargers

KEY PARAMETERS

V_{RRM}	2000V
$I_{F(AV)}$	335A
I_{FSM}	6000A

FEATURES

- High Surge Capability



Outline type code: DO9
See Package Details for further information.

VOLTAGE RATINGS

Type Number	Repetitive Peak Reverse Voltage V_{RRM} V	Conditions
TV30 20 M or K(R)	2000	$V_{RSM} = V_{RRM} + 100V$
TV30 14 M or K(R)	1400	
TV30 10 M or K(R)	1000	
TV30 06 M or K(R)	600	

Lower voltage grades available.
M for M16 thread. K for 3/4" - 16UNF thread, R for reverse polarity.

CURRENT RATINGS

Symbol	Parameter	Conditions	Max.	Units
Single Side Cooled				
$I_{F(AV)}$	Mean forward current	Half wave resistive load, T_{case} = 100°C	335	A
$I_{F(RMS)}$	RMS value	T_{case} = 100°C	525	A
I_F	Continuous (direct) forward current	T_{case} = 100°C	440	A

SURGE RATINGS

Symbol	Parameter	Conditions	Max.	Units
I_{FSM}	Surge (non-repetitive) forward current	10ms half sine; T_{case} = 175°C	4.8	kA
I^2t	I^2t for fusing	V_R = 50% V_{RRM} - 1/4 sine	115 x 10^6	A^2s
I_{FSM}	Surge (non-repetitive) forward current	10ms half sine; T_{case} =175°C	6.0	kA
I^2t	I^2t for fusing	V_R = 0	180 x 10^3	A^2s

THERMAL AND MECHANICAL DATA

Symbol	Parameter	Conditions	Min.	Max.	Units
$R_{th(j-c)}$	Thermal resistance - junction to case	dc	-	0.13	°C/W
$R_{th(c-h)}$	Thermal resistance - case to heatsink	Mounting torque 35.0Nm with mounting compound	-	0.06	°C/W
T_{vj}	Virtual junction temperature	Forward (conducting)	-	175	°C
		Reverse (blocking)	-	175	°C
T_{stg}	Storage temperature range		-55	200	°C
-	Mounting Torque		30.0	35.0	Nm

CHARACTERISTICS

Symbol	Parameter	Conditions	Typ.	Max.	Units
V_{FM}	Forward voltage	At 1000A peak, T_{case} = 25°C	-	1.4	V
I_{RRM}	Peak reverse current	At V_{RRM}, T_{case} = 175°C	-	20	mA
Q_S	Total stored charge	I_F = 200A, dI_{RR}/dt = 20A/µs, T_{case} = 25°C	300*	-	µC
I_{RM}	Peak recovery current		90*	-	A
t_{rr}	reverse recovery time		6.5*	-	µs
V_{TO}	Threshold voltage	At T_{vj} = 175°C	-	0.8	V
r_T	Slope resistance	At T_{vj} = 175°C	-	0.6	mΩ

**Typical values.*

CURVES

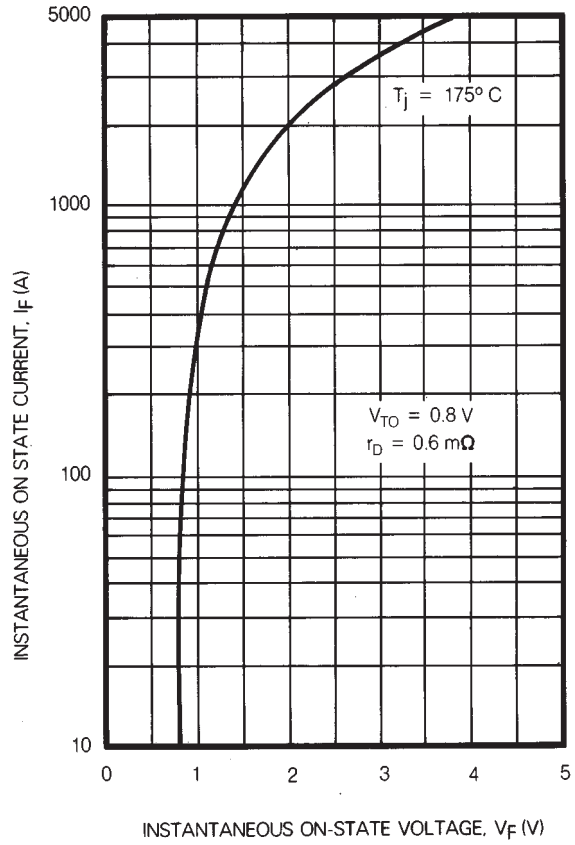


FIG. 1 MAXIMUM (LIMIT) FORWARD CONDUCTION CHARACTERISTIC

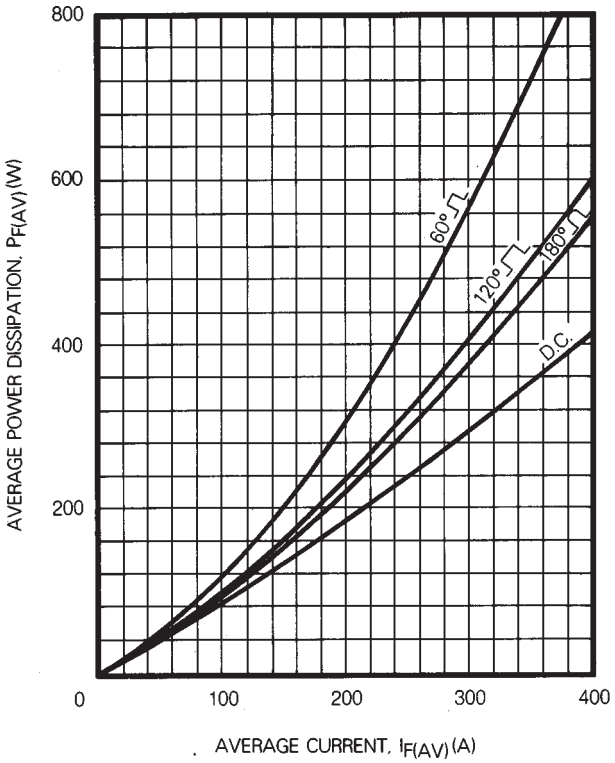


FIG. 2 MAXIMUM FORWARD POWER DISSIPATION

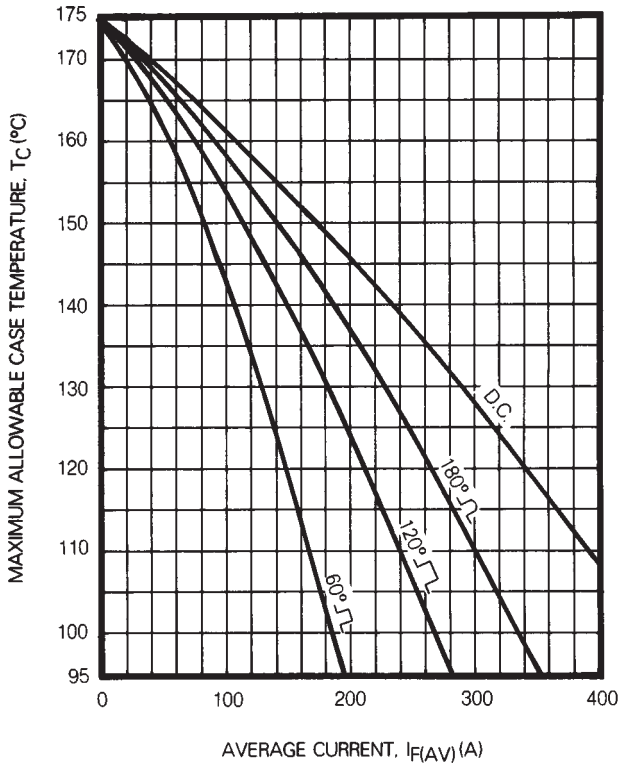
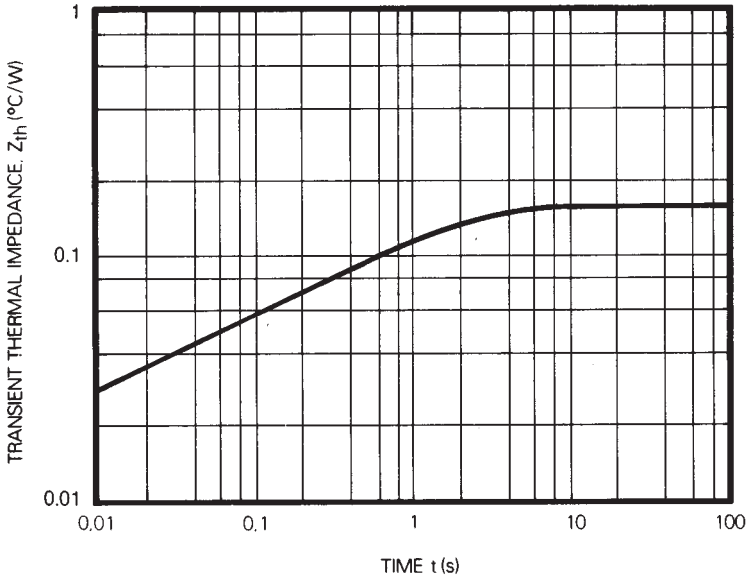


FIG. 3 MAXIMUM ALLOWABLE CASE TEMPERATURE



Conduction angle	Effective thermal Resistance (°C/W) Junction to case	
	Sinusoïdal	Rectangular
180°	0.173	0.192
120°	0.179	0.216
60°	0.208	0.272

FIG. 4 TRANSIENT THERMAL IMPEDANCE - JUNCTION TO CASE

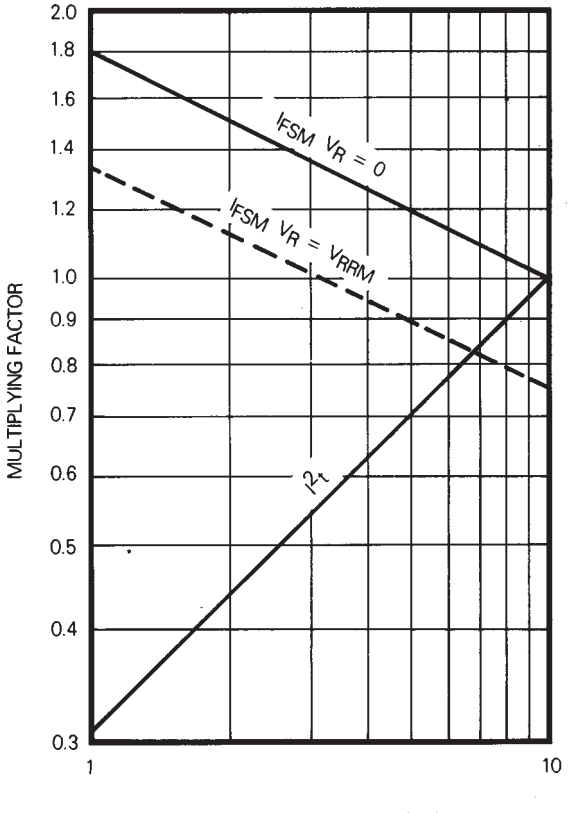


FIG. 5 MULTIPLYING FACTOR FOR NON-REPETITIVE SUB-CYCLE FORWARD CURRENT AND I2t RATING

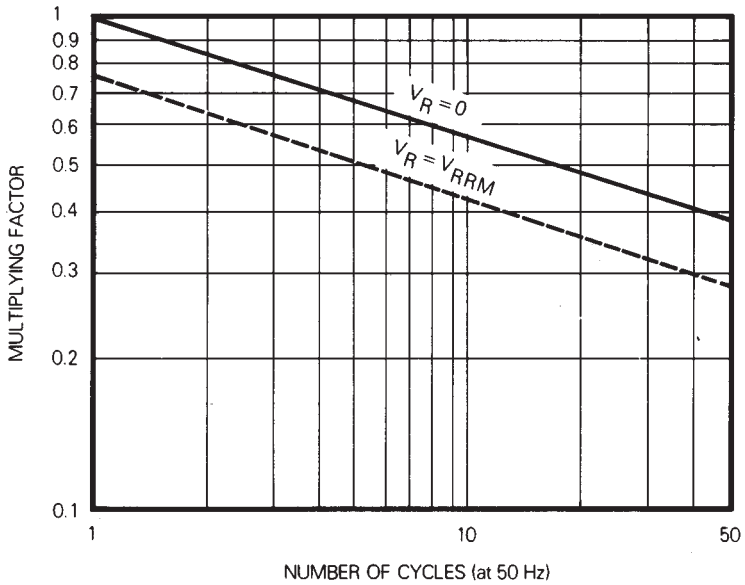
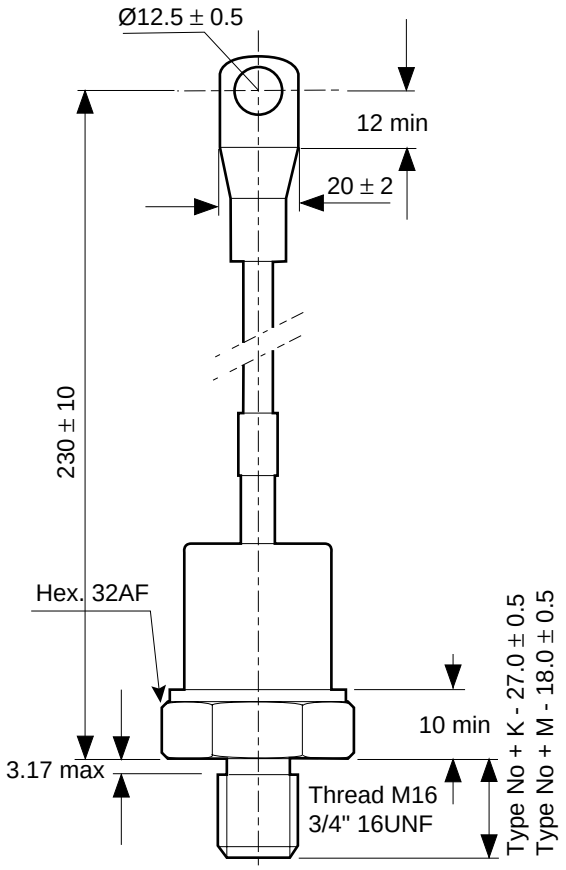


FIG. 6 MULTIPLYING FACTOR FOR NON-REPETITIVE FORWARD CURRENT

PACKAGE DETAILS

For further package information, please contact your local Customer Service Centre. All dimensions in mm, unless stated otherwise. DO NOT SCALE.



Package outline type code: DO9

ASSOCIATED PUBLICATIONS

Title	Application Note Number
Calculating the junction temperature or power semiconductors	AN4506
Thyristor and diode measurement with a multi-meter	AN4853
Use of V_{TO}, r_T on-state characteristic	AN5001

POWER ASSEMBLY CAPABILITY

The Power Assembly group was set up to provide a support service for those customers requiring more than the basic semiconductor, and has developed a flexible range of heatsink / clamping systems in line with advances in device types and the voltage and current capability of our semiconductors.

We offer an extensive range of air and liquid cooled assemblies covering the full range of circuit designs in general use today. The Assembly group continues to offer high quality engineering support dedicated to designing new units to satisfy the growing needs of our customers.

Using the up to date CAD methods our team of design and applications engineers aim to provide the Power Assembly Complete solution (PACs).

HEATSINKS

Power Assembly has it's own proprietary range of extruded aluminium heatsinks. They have been designed to optimise the performance or our semiconductors. Data with respect to air natural, forced air and liquid cooling (with flow rates) is available on request.

For further information on device clamps, heatsinks and assemblies, please contact your nearest Sales Representative or the factory.

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