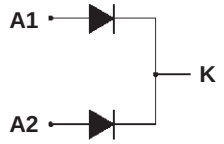
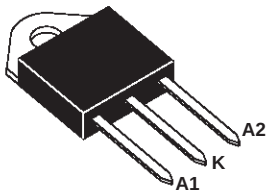
BYW99P/PI/W

HIGH EFFICIENCY FAST RECOVERY RECTIFIER DIODES

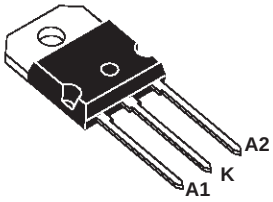
FEATURES

- SUITED FOR SMPS
- VERY LOW FORWARD LOSSES
- NEGLIGIBLE SWITCHING LOSSES
- HIGH SURGE CURRENT CAPABILITY
- HIGH AVALANCHE ENERGY CAPABILITY
- INSULATED VERSION TOP3I :
  Insulating voltage = 2500 V DC
  Capacitance = 12 pF

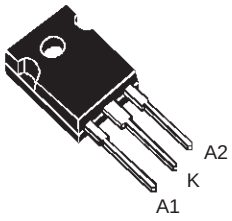




isolated
TOP3I
(Plastic)
BYW99PI-200



SOT93
(Plastic)
BYW99P-200



TO247
(Plastic)
BYW99W-200

DESCRIPTION

Dual center tap rectifier suited for switchmode power supply and high frequency DC to DC converters.
Packaged in SOT93, TOP3I or TO247 this device is intended for use in low voltage, high frequency inverters, free wheeling and polarity protection applications.

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter				Value	Unit
$I_{F(RMS)}$	RMS forward current			Per diode	35	A
$I_{F(AV)}$	Average forward current $\delta = 0.5$	SOT93 / TO247	Tc=120°C	Per diode	15	A
		TOP3I	Tc=115°C	Per diode	15	
I_{FSM}	Surge non repetitive forward current		tp=10ms sinusoidal	Per diode	200	A
Tstg Tj	Storage and junction temperature range				- 40 to + 150 - 40 to + 150	°C °C

Symbol	Parameter	Value	Unit
V_{RRM}	Repetitive peak reverse voltage	200	V

THERMAL RESISTANCES

Symbol	Parameter			Value	Unit
Rth (j-c)	Junction to case	SOT93 / TO247	Per diode	1.8	°C/W
			Total	1.0	
		TOP3I	Per diode	2.0	
			Total	1.25	
Rth (c)	Coupling	SOT93 / TO247		0.2	°C/W
		TOP3I		0.5	

When the diodes 1 and 2 are used simultaneously :
Tj-Tc (diode 1) = P(diode 1) x $R_{th(j-c)}$ (Per diode) + P(diode 2) x $R_{th(c)}$

STATIC ELECTRICAL CHARACTERISTICS (Per diode)

Symbol	Test Conditions		Min.	Typ.	Max.	Unit
I_R *	T_j = 25°C	$V_R = V_{RRM}$			20	µA
	T_j = 100°C				1.5	mA
V_F **	T_j = 125°C	I_F = 12 A			0.85	V
	T_j = 125°C	I_F = 25 A			1.05	
	T_j = 25°C	I_F = 25 A			1.15	

Pulse test : * tp = 5 ms, δ < 2 %
** tp = 380 µs, δ < 2 %

To evaluate the conduction losses use the following equation :
$P = 0.65 \times I_{F(AV)} + 0.016 \times I_F{}^2{}_{(RMS)}$

RECOVERY CHARACTERISTICS

Symbol	Test Conditions			Min.	Typ.	Max.	Unit
trr	T_j = 25°C	I_F = 0.5A I_R = 1A	Irr = 0.25A			25	ns
		I_F = 1A V_R = 30V	dI_F/dt = -50A/µs			40	
tfr	T_j = 25°C	I_F = 1A $V_{FR} = 1.1 \times V_F$	tr = 10 ns		15		ns
V_{FP}	T_j = 25°C	I_F = 1A	tr = 10 ns		2		V

Fig.1 : Average forward power dissipation versus average forward current.

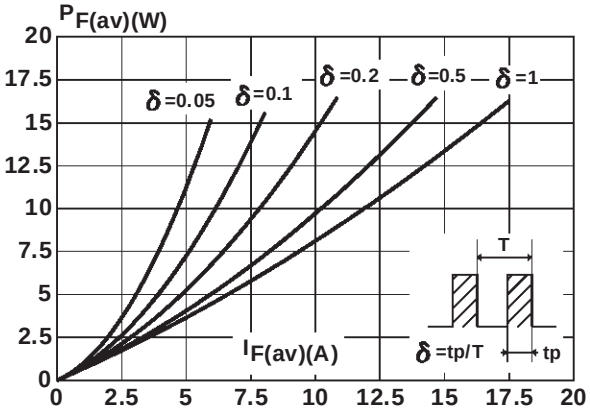


Fig.2 : Peak current versus form factor.

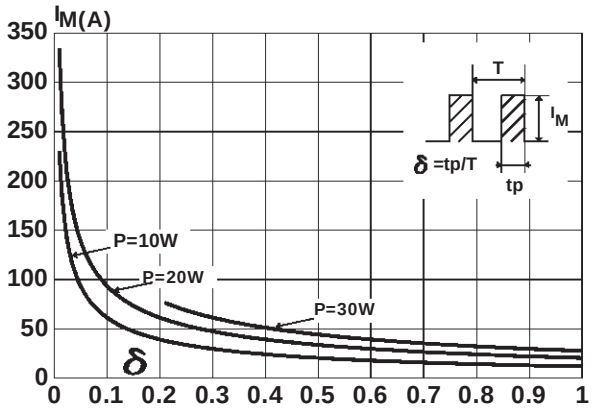


Fig.3 : Forward voltage drop versus forward current (maximum values).

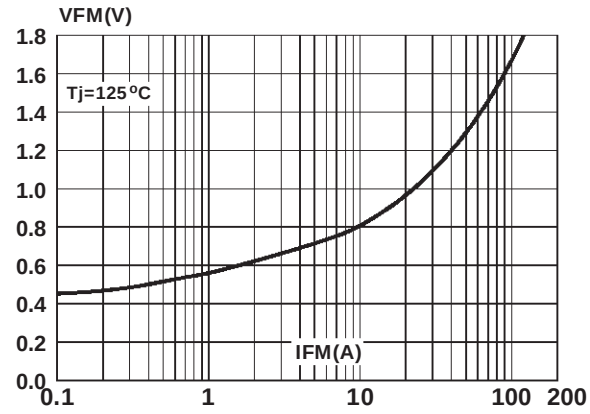


Fig.4 : Relative variation of thermal impedance junction to case versus pulse duration.

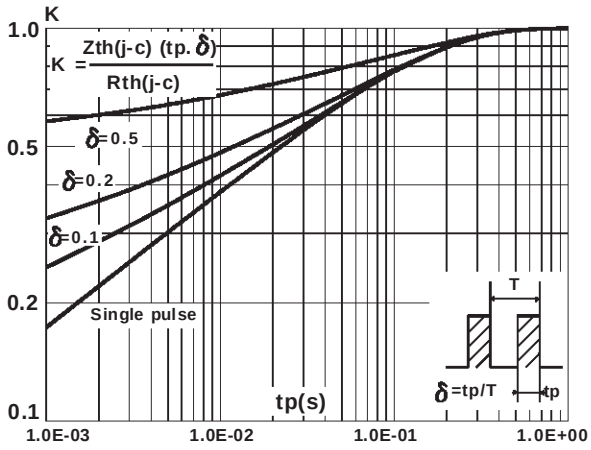


Fig.5 : Non repetitive surge peak forward current versus overload duration.
(SOT93, TO247)

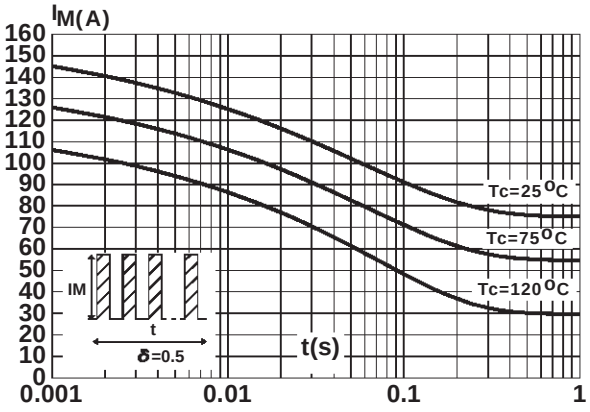


Fig.6 : Non repetitive surge peak forward current versus overload duration.
(TOP3I)

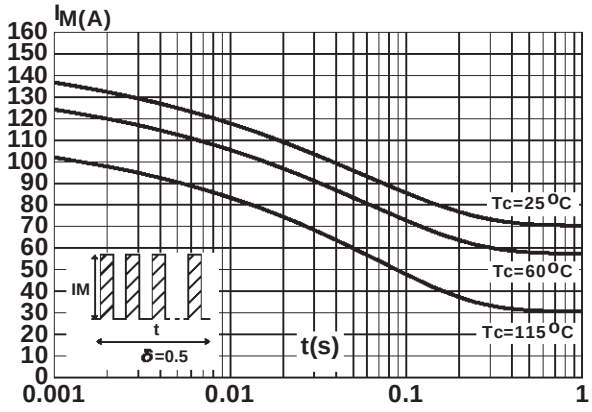


Fig.7 : Average current versus ambient temperature.
(δ = 0.5) (SOT93, TO247)

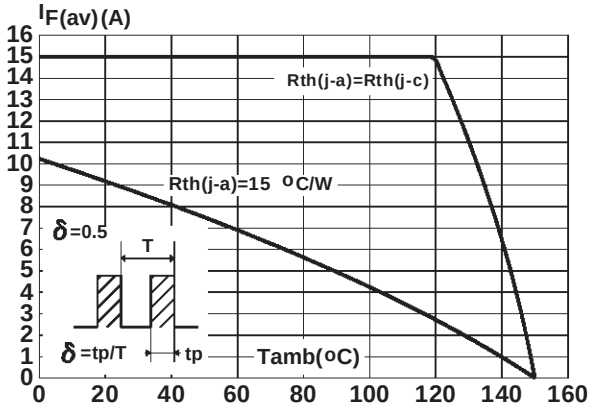


Fig.8 : Average current versus ambient temperature.
(δ = 0.5) (TOP3I)

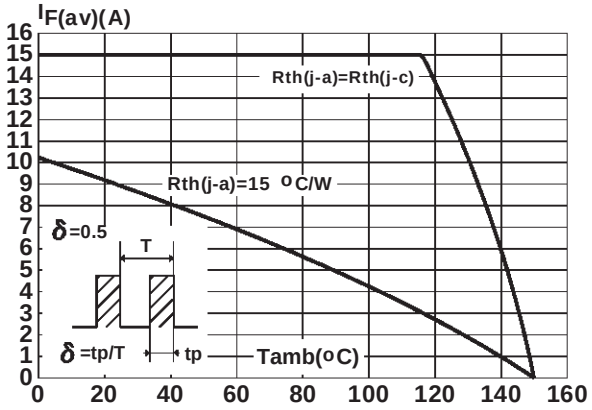


Fig.9 : Junction capacitance versus reverse voltage applied (Typical values).

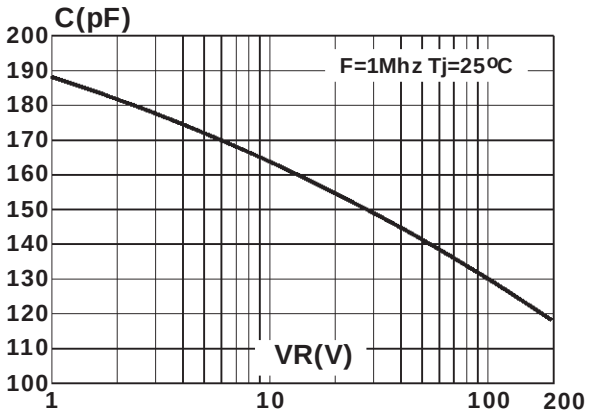


Fig.10 : Recovery charges versus dI_F/dt.

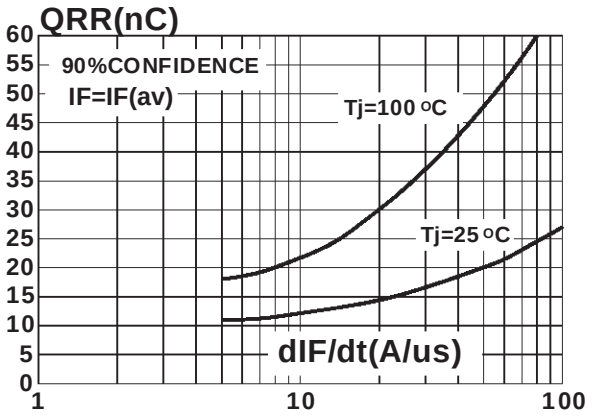


Fig.11 : Peak reverse current versus dIF/dt.

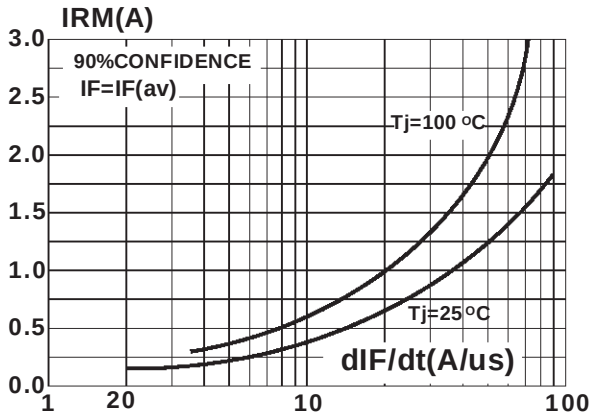
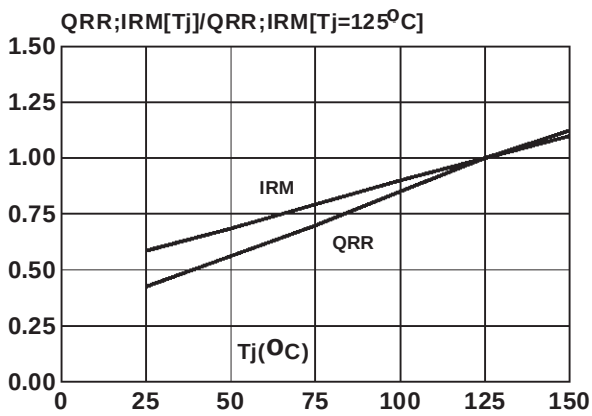
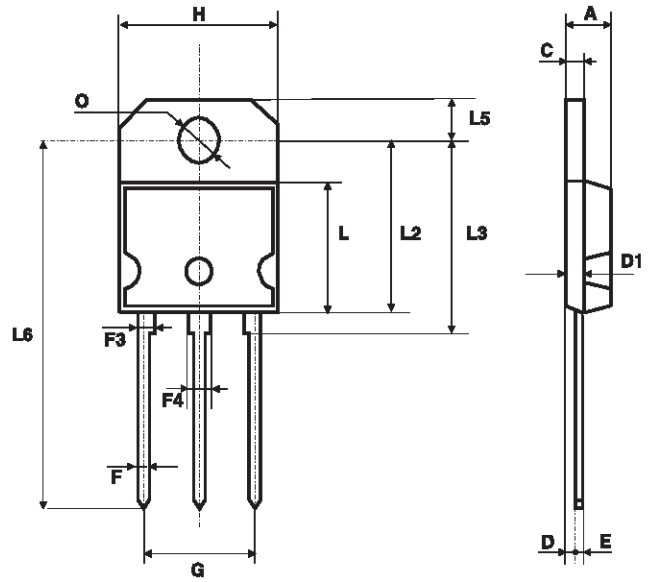


Fig.12 : Dynamic parameters versus junction temperature.



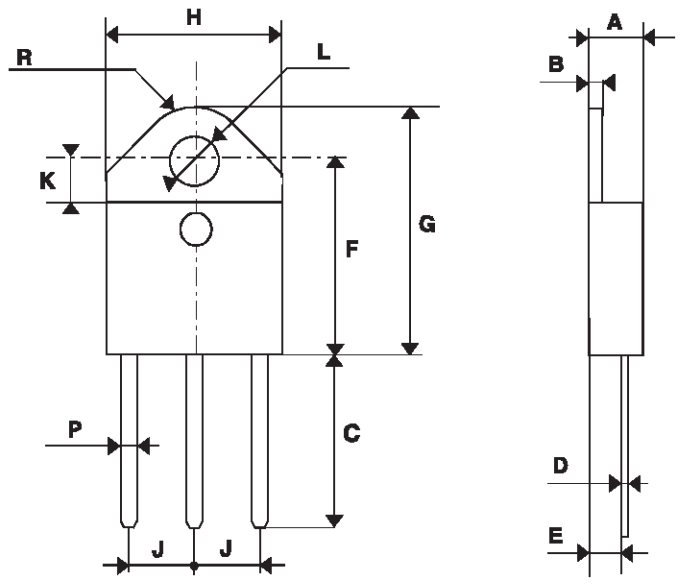
PACKAGE MECHANICAL DATA
SOT93



REF.	DIMENSIONS					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.70		4.90	1.185		0.193
C	1.90		2.10	0.075		0.083
D		2.50			0.098	
D1		2.00			0.078	
E	0.50		0.78	0.020		0.031
F	1.10		1.30	0.043		0.051
F3		1.75			0.069	
F4		2.10			0.083	
G	10.80		11.10	0.425		0.437
H	14.70		15.20	0.279		0.598
L			12.20			0.480
L2			16.20			0.638
L3		18.0			0.709	
L5	3.95		4.15	0.156		0.163
L6		31.00			1.220	
O	4.00		4.10	0.157		0.161

- **Marking** : Type number
- Cooling method : C
- Weight : 5.3 g
- Recommended torque value : 0.8m.N
- Maximum torque value : 1.0m.N

PACKAGE MECHANICAL DATA
TOP3I (isolated)

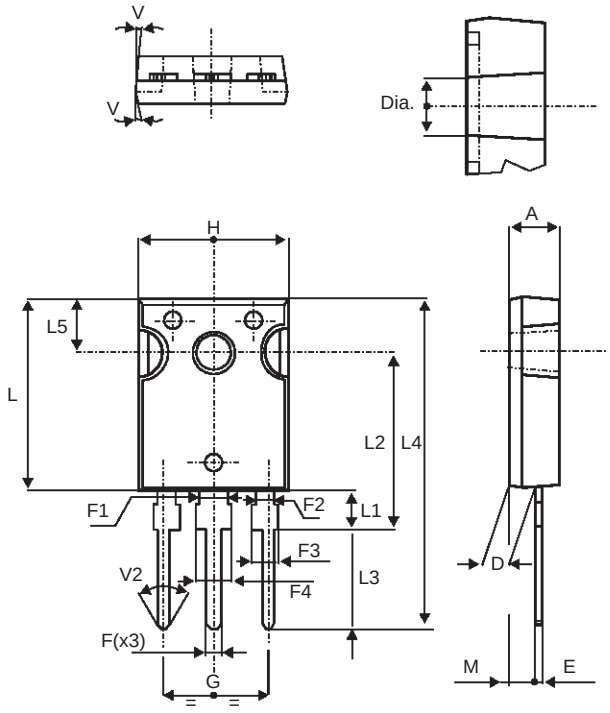


REF.	DIMENSIONS					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.4		4.6	0.173		0.181
B	1.45		1.55	0.057		0.061
C	14.35		15.60	0.565		0.614
D	0.5		0.7	0.020		0.028
E	2.7		2.9	0.106		0.114
F	15.8		16.5	0.622		0.650
G	20.4		21.1	0.815		0.831
H	15.1		15.5	0.594		0.610
J	5.4		5.65	0.213		0.222
K	3.4		3.65	0.134		0.144
L	4.08		4.17	0.161		0.164
P	1.20		1.40	0.047		0.055
R		4.60			0.181	

- **Marking** : Type number
- Cooling method : C
- Weight : 4.7 g
- Recommended torque value : 0.8m.N
- Maximum torque value : 1.0m.N

PACKAGE MECHANICAL DATA

TO247



REF.	DIMENSIONS					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.85		5.15	0.191		0.203
D	2.20		2.60	0.086		0.102
E	0.40		0.80	0.015		0.031
F	1.00		1.40	0.039		0.055
F1		3.00			0.118	
F2		2.00			0.078	
F3	2.00		2.40	0.078		0.094
F4	3.00		3.40	0.118		0.133
G		10.90			0.429	
H	15.45		15.75	0.608		0.620
L	19.85		20.15	0.781		0.793
L1	3.70		4.30	0.145		0.169
L2		18.50			0.728	
L3	14.20		14.80	0.559		0.582
L4		34.60			1.362	
L5		5.50			0.216	
M	2.00		3.00	0.078		0.118
V		5°			5°	
V2		60°			60°	
Dia.	3.55		3.65	0.139		0.143

- **Marking** : Type number
- Cooling method : C
- Weight : 4.4 g
- Recommended torque value : 0.8m.N
- Maximum torque value : 1.0m.N