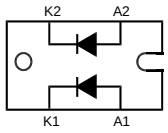
BYT60P-1000
BYT261PIV-1000

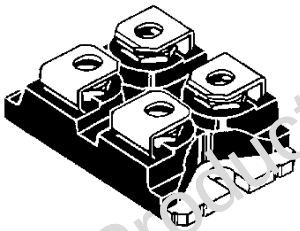
FAST RECOVERY RECTIFIER DIODES

MAJOR PRODUCT CHARACTERISTICS

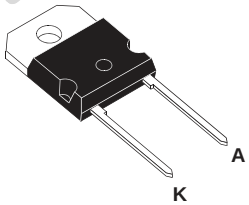
$I_{F(AV)}$	2 x 60 A
V_{RRM}	1000 V
V_F (max)	1.8 V
trr (max)	70 ns



BYT261PIV-1000



ISOTOP™
(Plastic)



SOD93
(Plastic)

FEATURES AND BENEFITS

- VERY LOW REVERSE RECOVERY TIME
- VERY LOW SWITCHING LOSSES
- LOW NOISE TURN-OFF SWITCHING
- INSULATED PACKAGE: ISOTOP
  Insulation voltage: 2500 V_{RMS}
  Capacitance = 45 pF
  Inductance < 5 nH

DESCRIPTION

Dual or high single voltage rectifier devices suited for Switch Mode Power Supplies and other power converters.

These devices are packaged in ISOTOP or in SOD93.

ABSOLUTE RATINGS (limiting values, per diode)

Symbol	Parameter			Value	Unit
V_{RRM}	Repetitive peak reverse voltage			1000	V
I_{FRM}	Repetitive peak forward current	tp=5 µs F=1kHz		1000	A
$I_{F(RMS)}$	RMS forward current	ISOTOP		140	A
		SOD93		100	
$I_{F(AV)}$	Average forward current δ = 0.5	Tc = 50°C	ISOTOP	60	A
		Tc = 60°C	SOD93	60	
I_{FSM}	Surge non repetitive forward current	tp = 10 ms Sinusoidal		400	A
T_{stg}	Storage temperature range			- 40 to + 150	°C
Tj	Maximum operating junction temperature			150	°C

TM: ISOTOP is a registered trademark of STMicroelectronics.

THERMAL RESISTANCES

Symbol	Parameter			Value	Unit
$R_{th(j-c)}$	Junction to case	ISOTOP	Per diode Total	0.8 0.45	°C/W
		SOD93	Total	0.7	
$R_{th(c)}$			Coupling	0.1	°C/W

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

STATIC ELECTRICAL CHARACTERISTICS (per diode)

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
V_F *	Forward voltage drop	Tj = 25°C	I_F = 60 A			1.9	V
		Tj = 100°C				1.8	
I_R **	Reverse leakage current	Tj = 25°C	$V_R = V_{RRM}$			100	µA
		Tj = 100°C				6	mA

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

To evaluate the conduction losses use the following equation:
$P = 1.47 \times I_{F(AV)} + 0.005\ I_F{}^2{}_{(RMS)}$

RECOVERY CHARACTERISTICS (per diode)

Symbol	Test Conditions		Min.	Typ.	Max.	Unit
t_{rr}	Tj = 25°C	I_F = 1A V_R = 30V dI_F/dt = - 15A/µs			170	ns
		I_F = 0.5A I_R = 1A I_{rr} = 0.25A			70	

TURN-OFF SWITCHING CHARACTERISTICS

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
t_{IRM}	Maximum reverse recovery time	dI_F/dt = - 240 A/µs	V_{CC} = 200 V I_F = 60 A $L_p \leq$ 0.05 µH Tj = 100°C (see fig. 13)			200	ns
		dI_F/dt = - 480 A/µs			120		
I_{RM}	Maximum reverse recovery current	dI_F/dt = - 240 A/µs				40	A
		dI_F/dt = - 480 A/µs			44		
$C = \frac{V_{RP}}{V_{CC}}$	Turn-off overvoltage coefficient	Tj = 100°C V_{CC} = 200V $I_F = I_{F(AV)}$ dI_F/dt = - 60A/µs L_p = 2.5µH (see fig. 14)			3.3	4.5	/

Fig. 1-1: Average forward power dissipation versus average forward current (per diode, ISOTOP).

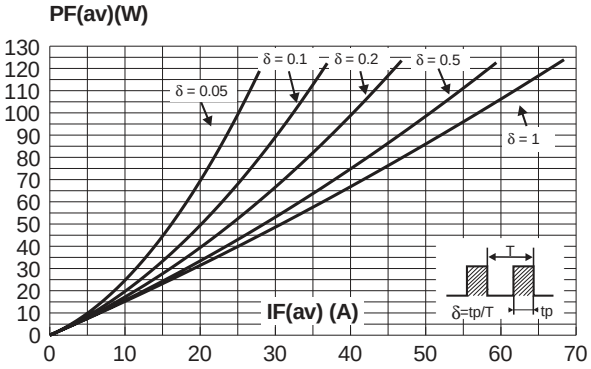


Fig. 1-2: Average forward power dissipation versus average forward current (SOD93).

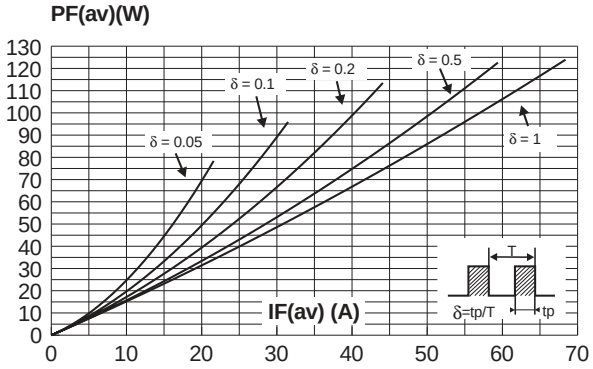


Fig. 2-1: Peak current versus form factor (per diode, ISOTOP).

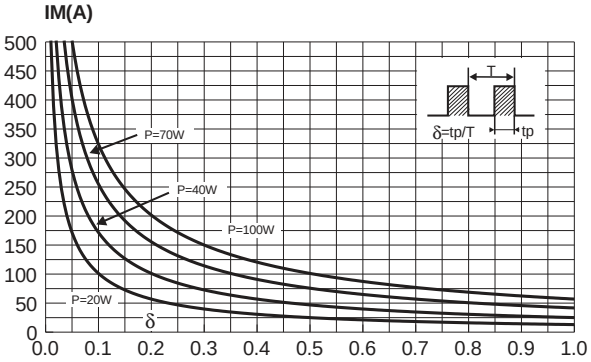


Fig. 2-2: Peak current versus form factor (SOD93).

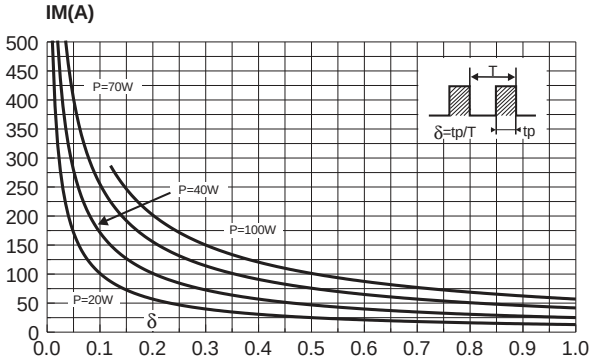


Fig. 3: Average forward current versus ambient temperature (δ=0.5, per diode for ISOTOP).

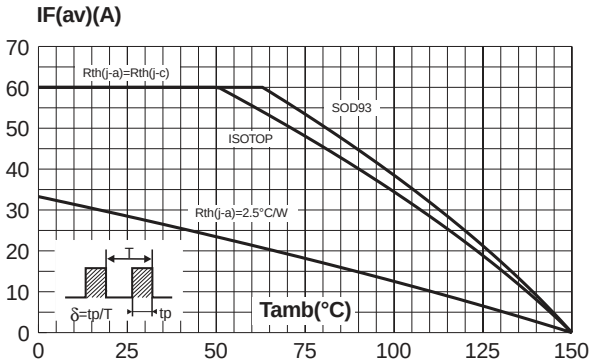


Fig. 4-1: Non repetitive surge peak forward current versus overload duration (SOD93).

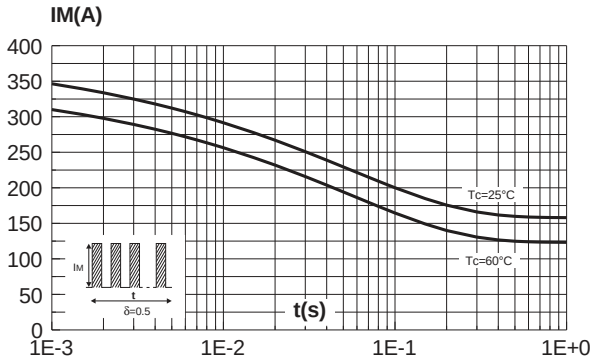


Fig. 4-2: Non repetitive surge peak forward current versus overload duration (per diode, ISOTOP).

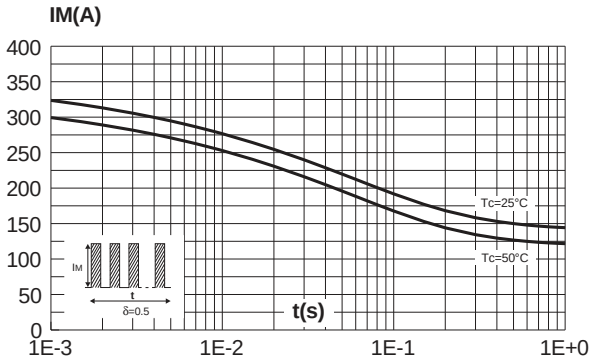


Fig. 5-1: Relative variation of thermal impedance junction to case versus pulse duration (per diode, ISOTOP).

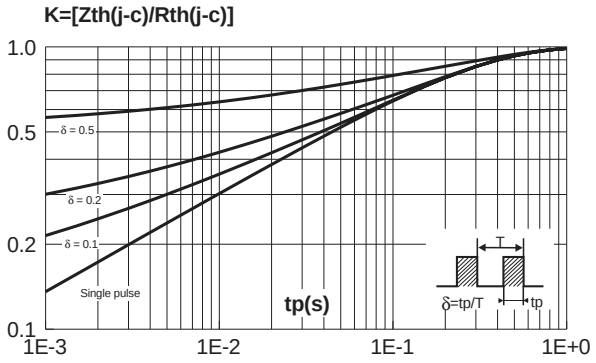


Fig. 5-2: Relative variation of thermal impedance junction to case versus pulse duration (SOD93).

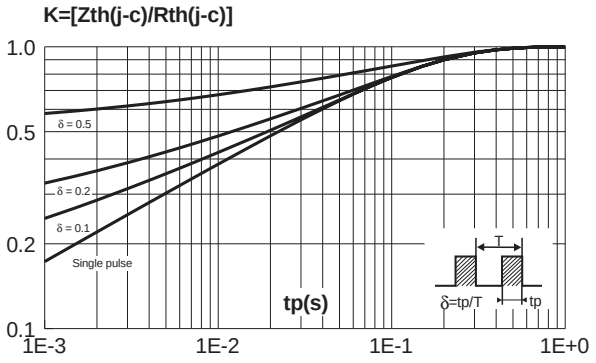


Fig. 6: Forward voltage drop versus forward current (maximum values, per diode for ISOTOP).

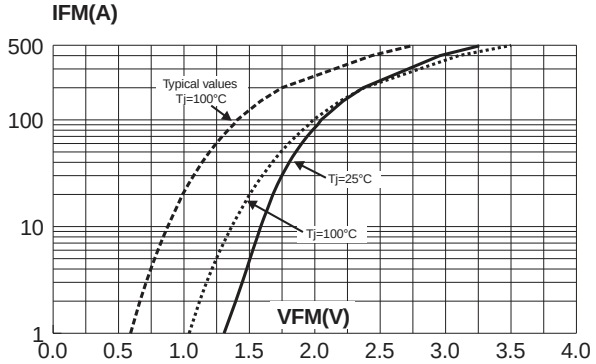


Fig. 7: Junction capacitance versus reverse voltage applied (typical values, per diode for ISOTOP).

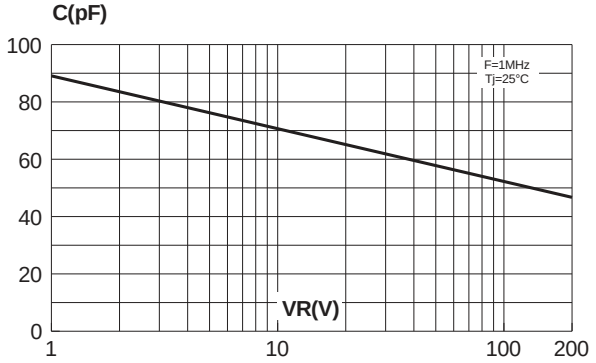


Fig. 8: Recovery charges versus dI_F/dt (per diode for ISOTOP).

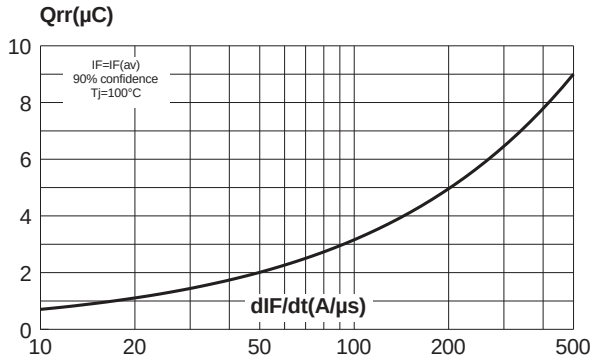


Fig. 9: Recovery current versus dI_F/dt (per diode for ISOTOP).

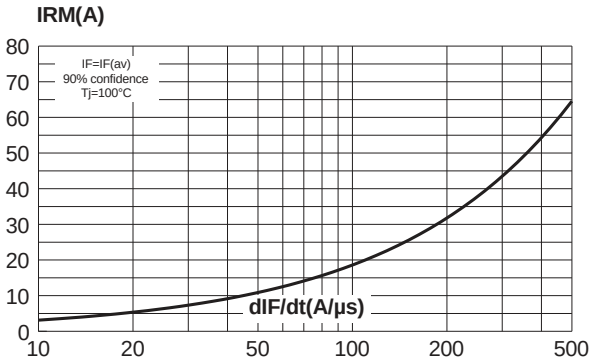


Fig. 10: Transient peak forward voltage versus dI_F/dt (per diode for ISOTOP).

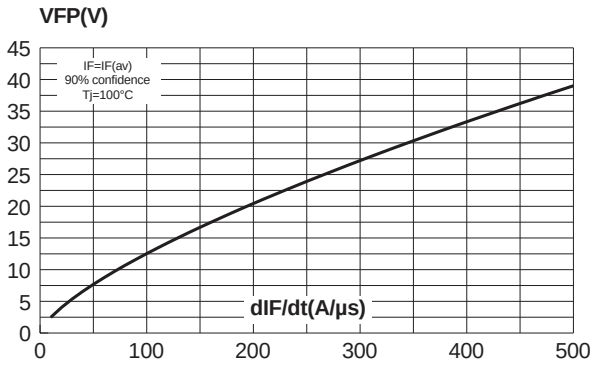


Fig. 11: Forward recovery time versus dI_F/dt (per diode for ISOTOP).

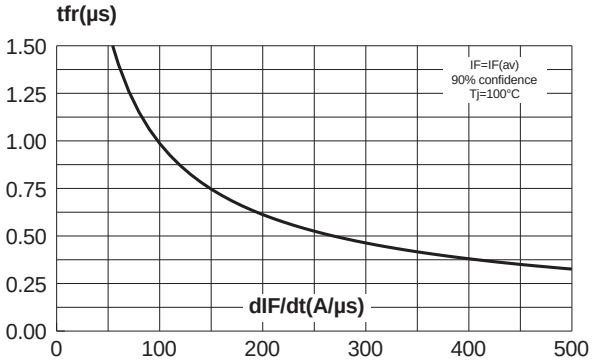


Fig. 12: Dynamic parameters versus junction temperature.

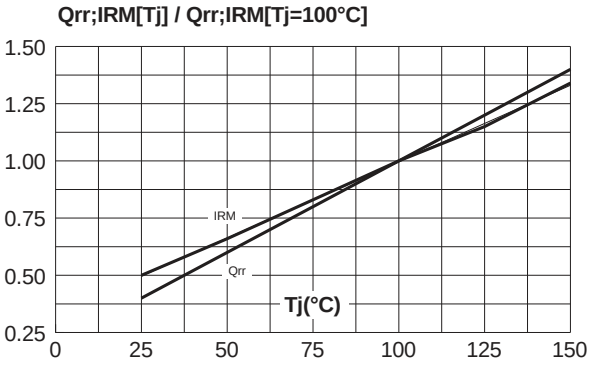


Fig. 13: Turn-off switching characteristics (without serie inductance).

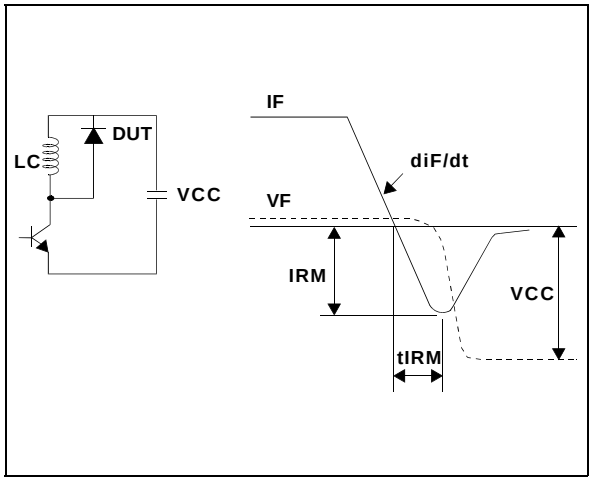
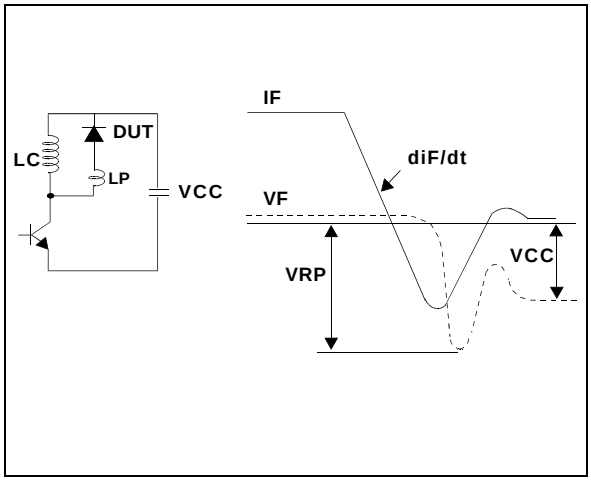
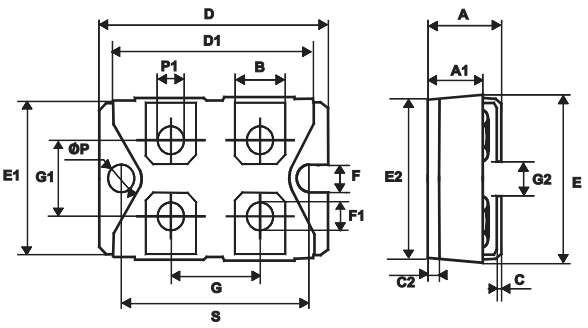


Fig. 14: Turn-off switching characteristics (with serie inductance).



PACKAGE MECHANICAL DATA

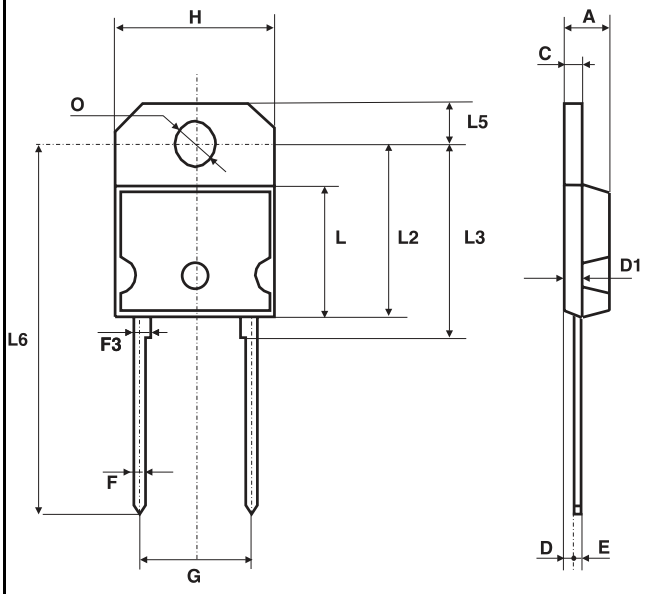
ISOTOP



REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	11.80	12.20	0.465	0.480
A1	8.90	9.10	0.350	0.358
B	7.8	8.20	0.307	0.323
C	0.75	0.85	0.030	0.033
C2	1.95	2.05	0.077	0.081
D	37.80	38.20	1.488	1.504
D1	31.50	31.70	1.240	1.248
E	25.15	25.50	0.990	1.004
E1	23.85	24.15	0.939	0.951
E2	24.80 typ.		0.976 typ.	
G	14.90	15.10	0.587	0.594
G1	12.60	12.80	0.496	0.504
G2	3.50	4.30	0.138	0.169
F	4.10	4.30	0.161	0.169
F1	4.60	5.00	0.181	0.197
P	4.00	4.30	0.157	0.69
P1	4.00	4.40	0.157	0.173
S	30.10	30.30	1.185	1.193

PACKAGE MECHANICAL DATA

SOD93 Plastic



REF.	DIMENSIONS					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.70		4.90	0.185		0.193
C	1.17		1.37	0.046		0.054
D		2.50			0.098	
D1		1.27			0.050	
E	0.50		0.78	0.020		0.031
F	1.10		1.30	0.043		0.051
F3		1.75			0.069	
G	10.80		11.10	0.425		0.437
H	14.70		15.20	0.578		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

Ordering type	Marking	Package	Weight	Base qty	Delivery mode
BYT60P-1000	BYT60P-1000	SOD93	3.79 g.	30	Tube
BYT261PIV-1000	BYT261PIV-1000	ISOTOP	28 g. (without screws)	10	Tube

- Cooling method: by conduction (C)
- Recommended torque value (ISOTOP): 1.3 N.m (MAX 1.5 N.m) for the 6 x M4 screws. (2 x M4 screws recommended for mounting the package on the heatsink and the 4 screws given with the screw version).The screws supplied with the package are adapted for mounting on a board (or other types of terminals) with a thickness of 0.6 mm min and 2.2 mm max.
- Recommended torque value (SOD93): 0.8 N.m.
- Maximum torque value (SOD93): 1.0 N.m.
- Epoxy meets UL94,V0