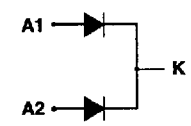
SGS-THOMSON MICROELECTRONICS

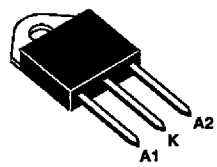
STPS60xxCP/CPI
STPS6045CW

POWER SCHOTTKY RECTIFIERS

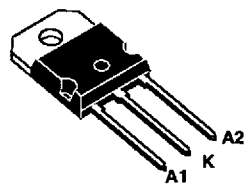
FEATURES AND BENEFITS

- VERY SMALL CONDUCTION LOSSES
- NEGLIGIBLE SWITCHING LOSSES
- EXTREME FAST SWITCHING
- HIGH AVALANCHE CAPABILITY
- LOW THERMAL RESISTANCE
- INSULATED PACKAGE:
  Insulating voltage = 2500V_{RMS}
  Capacitance = 12pF

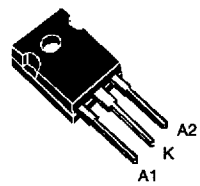




isolated TOP3I
(Plastic)
STPS6035CPI
STPS6045CPI



SOT93
(Plastic)
STPS6035CP
STPS6045CP



TO247
(Plastic)
STPS6045CW

DESCRIPTION

Dual center tap schottky 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 RATINGS (limiting values)

Symbol	Parameter				Value	Unit
$I_{F(RMS)}$	RMS Forward Current			Per diode	60	A
$I_{F(AV)}$	Average Forward Current	SOT93/TO247	Tc = 125°C	Per diode	30	A
	δ = 0.5	TOP3I	Tc = 105°C	Per device	60	
I_{FSM}	Surge Non Repetitive Forward Current		Tp = 10 ms Sinusoidal	Per diode	400	A
I_{RRM}	Peak Repetitive Reverse Current		Tp = 2 µs F = 1KHz	Per diode	1	A
Tstg Tj	Storage and Junction Temperature Range				- 65 to + 150 - 65 to + 150	°C
dV/dt	Critical Rate of Rise of Reverse Voltage				1000	V/µs

Symbol	Parameter	STPS		Unit
		6035CP 6035CPI	6045CP 6045CPI 6045CW	
V_{RRM}	Repetitive Peak Reverse Voltage	35	45	V

THERMAL RESISTANCE

Symbol	Parameter			Value	Unit
$R_{TH\ (j-c)}$	Junction-case	SOT93/TO247	Per diode total	0.95 0.55	°C/W
		TOP3I	Per diode total	1.8 1.1	
$R_{TH\ (c)}$	Coupling	SOT93/TO247		0.15	°C/W
		TOP3I		0.4	

When the diodes 1 and 2 are used simultaneously :
ΔT_J(diode 1) = P(diode1) x R_{TH}(Per diode) + P(diode 2) x $R_{TH(c)}$

ELECTRICAL CHARACTERISTICS

STATIC CHARACTERISTICS PER DIODE

Symbol	Parameter	Tests Conditions		Min.	Typ.	Max.	Unit
I_R *	Reverse leakage current	Tj = 25°C	$V_R = V_{RRM}$			500	µA
		Tj = 125°C				80	mA
V_F **	Forward voltage drop	Tj = 125°C	I_F = 60 A			0.78	V
		Tj = 125°C	I_F = 30 A			0.63	
		Tj = 25°C	I_F = 60 A			0.84	

Pulse test : * tp = 5 ms, duty cycle < 2 %

** tp = 380 µs, duty cycle < 2%

To evaluate the conduction losses use the following equation:

$P = 0.48 \times I_{F(AV)} + 0.005\ I_F{}^2{}_{(RMS)}$

Fig. 1: Average forward power dissipation versus average forward current. (Per diode)

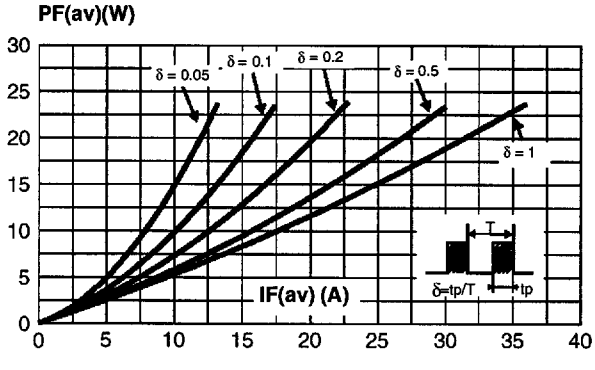


Fig. 2: Average current versus ambient temperature (duty cycle: 0.5) (per diode) (SOT93 and TO247).

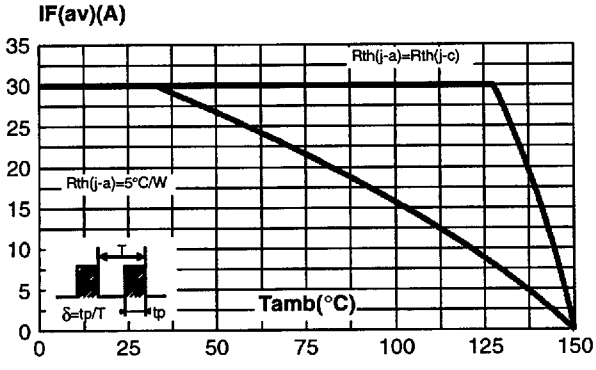


Fig. 3: Average current versus ambient temperature (duty cycle: 0.5) (per diode) (TOP3I).

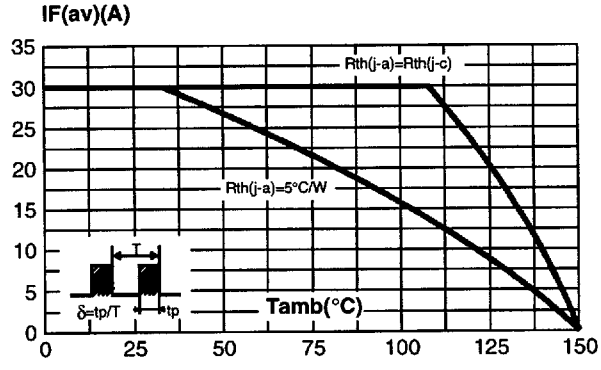


Fig. 4: Non repetitive surge peak forward current versus overload duration (maximum values) (per diode) (SOT93 and TO247).

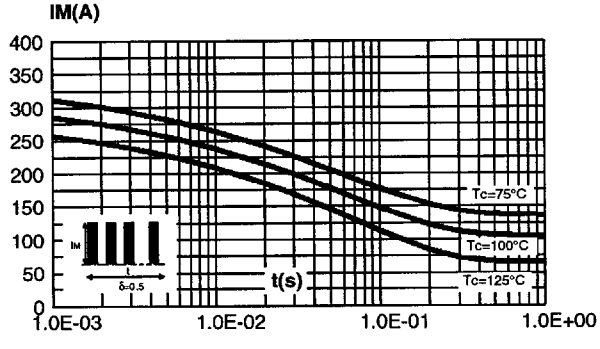


Fig. 5: Non repetitive surge peak forward current versus overload duration (maximum values) (per diode) (TOP3I).

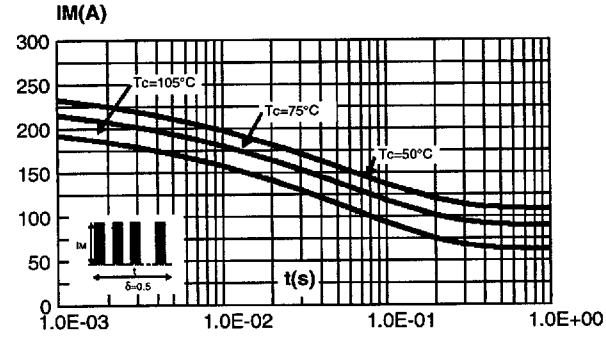


Fig. 6: Relative variation of thermal transient impedance junction to case versus pulse duration.

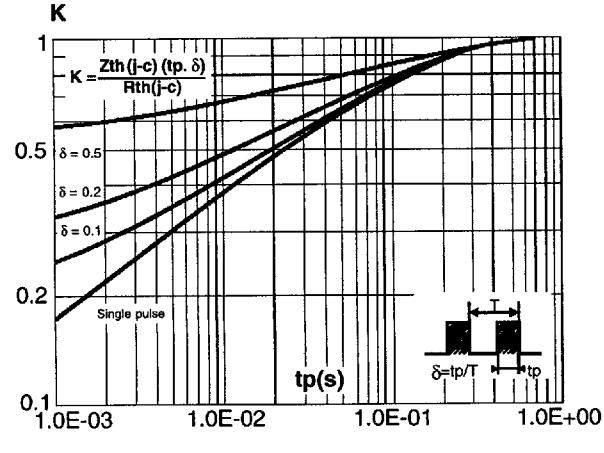


Fig. 7: Reverse leakage current versus reverse voltage applied (typical values) (per diode).

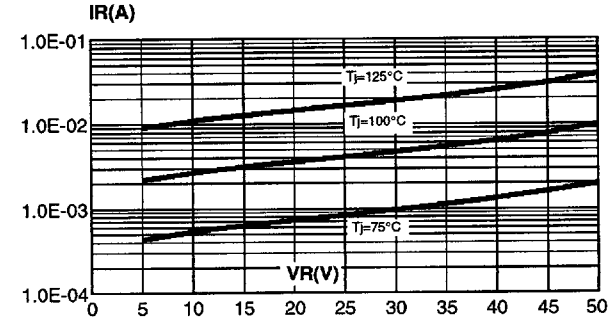


Fig. 8: Junction capacitance versus reverse voltage applied (typical values) (per diode).

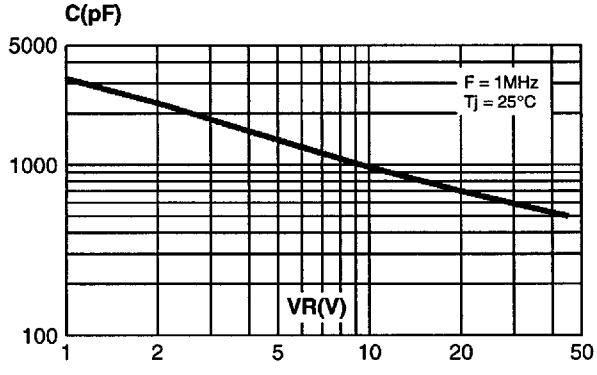
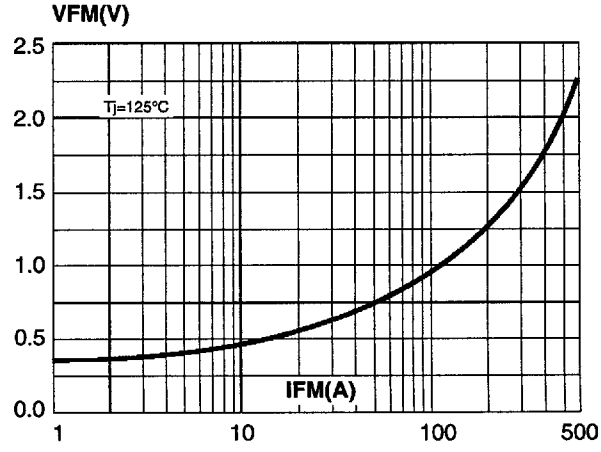
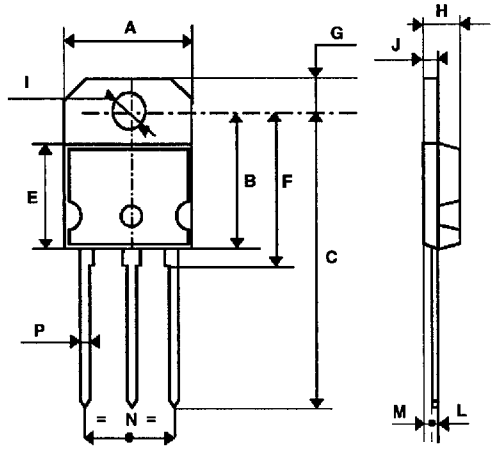


Fig. 9: Forward voltage drop versus forward current (maximum values) (per diode).



PACKAGE MECHANICAL DATA

SOT93

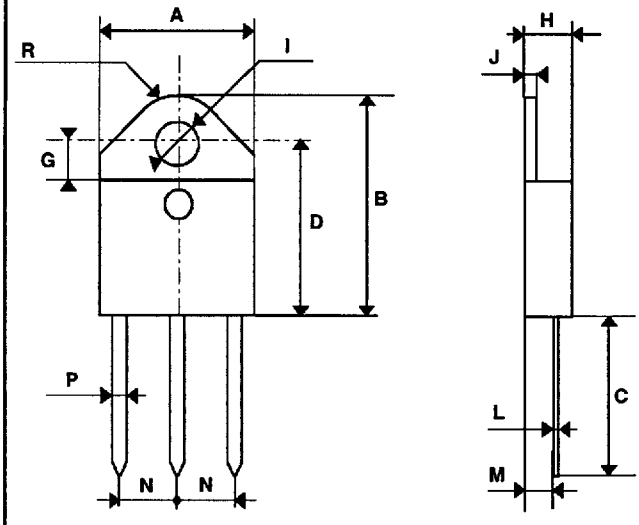


REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	14.7	15.2	0.578	0.596
B		16.2		0.637
C	31 typ		1.220 typ	
D	18 typ		0.708 typ	
E		12.2		0.480
G	3.95	4.15	0.155	0.163
H	4.7	4.9	0.185	0.193
I	4	4.1	0.157	0.161
J	1.9	2.1	0.062	0.075
L	0.5	0.78	0.019	0.030
M	2.5 typ		0.098 typ	
N	10.8	11.1	0.425	0.437
P	1.1	1.3	0.043	0.051

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

PACKAGE MECHANICAL DATA

TOP3I (isolated)

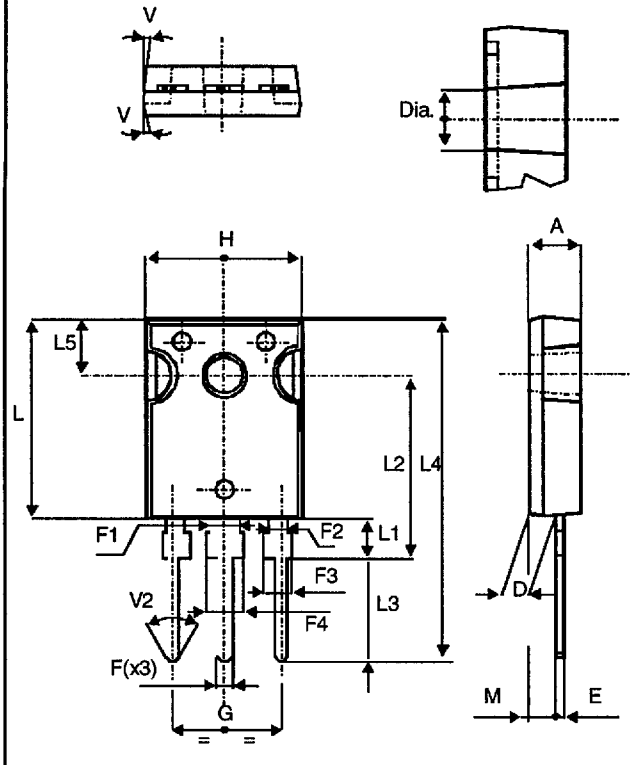


REF.	DIMENSIONS					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	15.10		15.50	0.594		0.610
B	20.70		21.10	0.815		0.831
C	14.35		15.60	0.565		0.614
D	16.10		16.50	0.630		0.650
G	3.40		3.65	0.134		0.144
H	4.40		4.60	0.173		0.181
I	4.08		4.17	0.161		0.164
J	1.45		1.55	0.057		0.061
L	0.50		0.70	0.020		0.028
M	2.70		2.90	0.106		0.114
N	5.40		5.65	0.213		0.222
P	1.20		1.40	0.047		0.056
R		4.60			0.181	

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

PACKAGE MECHANICAL DATA

TO247



REF.	DIMENSIONS					
	Millimeters			Inches		
	Typ.	Min.	Max.	Typ.	Min.	Max.
A		4.70	5.30		0.190	0.210
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		15.30	15.90		0.602	0.625
L		19.70	20.30		0.775	0.799
L1		3.70	4.30		0.145	0.169
L2	18.50			0.728		
L3	10.50			0.413		
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

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