SGS-THOMSON MICROELECTRONICS

STPS2035CT/CF
STPS2045CT/CF

POWER SCHOTTKY RECTIFIER

- VERY SMALL CONDUCTION LOSSES
- NEGLIGIBLE SWITCHING LOSSES
- EXTREMELY FAST SWITCHING
- LOW FORWARD VOLTAGE DROP
- HIGH AVALANCHE CAPABILITY
- LOW THERMAL RESISTANCE
- INSULATED PACKAGE :
  Insulating voltage = 2000V DC
  Capacitance = 12pF

TO220AB
(Plastic)

STPS2035CT
STPS2045CT

ISOWATT220AB
(Plastic)

STPS2035CF
STPS2045CF

DESCRIPTION

Dual center tap schottky rectifier suited for switch-mode power supply and high frequency DC to DC converters.

Packaged in TO220AB and ISOWATT220AB, this device is intended for use in low voltage, high frequency inverters, free wheeling and polarity protection applications.
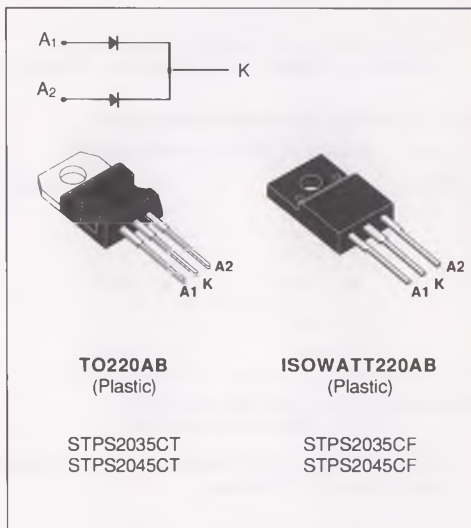
ABSOLUTE RATINGS (limiting values)

Symbol	Parameter				Value	Unit
$I_{F(RMS)}$	RMS Forward Current			Per diode	30	A
$I_{F(AV)}$	Average Forward Current $\delta = 0.5$	TO220AB	$T_c = 135°C$	Per diode	10	A
		ISOWATT220AB	$T_c = 120°C$	Per device	20	
I_{FSM}	Surge Non Repetitive Forward Current		$T_p = 10$ ms Sinusoidal	Per diode	180	A
I_{RRM}	Peak Repetitive Reverse Current		$T_p = 2$ 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
		2035CT 2035CF	2045CT 2045CF	
V_{RRM}	Repetitive Peak Reverse Voltage	35	45	V

THERMAL RESISTANCE

Symbol	Parameter			Value	Unit
$R_{TH (j-c)}$	Junction-case	TO220AB	Per diode total	2.2 1.3	°C/W
		ISOWATT220AB	Per diode total	4.5 3.5	
$R_{TH (c)}$	Coupling	TO220AB		0.3	°C/W
		ISOWATT220AB		2.5	

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

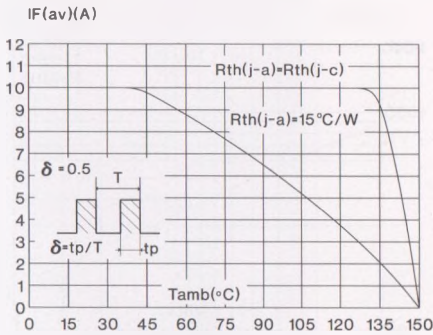| Symbol	Tests Conditions		Min.	Typ.	Max.	Unit
I_R *	Tj = 25°C	$V_R = V_{RRM}$			100	µA
	Tj = 125°C				15	mA
V_F **	Tj = 125°C	I_F = 20 A			0.72	V
	Tj = 125°C	I_F = 10 A			0.57	
	Tj = 25°C	I_F = 20 A			0.84	

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

To evaluate the conduction losses use the following equation :

$P = 0.42 \times I_{F(AV)} + 0.015 \ I_F^2{}_{(RMS)}$

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

SGS-THOMSON
MICROELECTRONICS
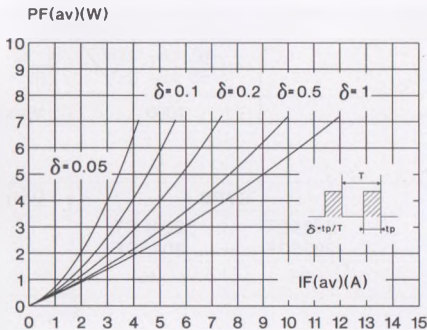
Fig. 2 : Average current versus ambient temperature. (duty cycle : 0.5) (Per diode) (TO220AB)

IF(av)(A)

Rth(j-a)=Rth(j-c)

Rth(j-a)=15°C/W

δ=0.5

T

δ=tp/T ─ tp

Tamb(°C)

Fig. 3 : Average current versus ambient temperature. (duty cycle : 0.5) (Per diode) (ISOWATT220AB)

IF(av)(A)

Rth(j-a)=Rth(j-c)

Rth(j-a)=15°C/W

δ=0.5

T

δ=tp/T ─ tp

Tamb(°C)
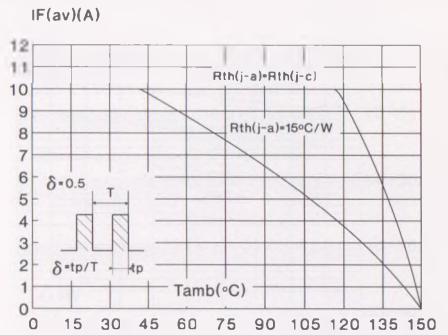
Fig. 4 : Non repetitive surge peak forward current versus overload duration.
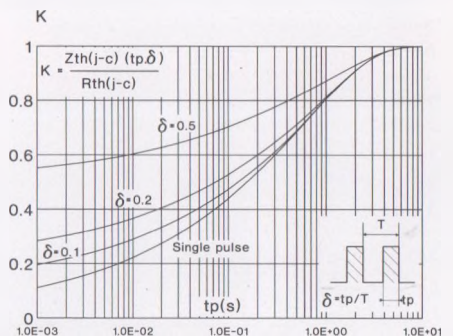(Maximum values) (Per diode) (TO220AB)

IM(A)

IM
t
δ=0.5

Tc=75°C
Tc=100°C
t(s)
Tc=135°C
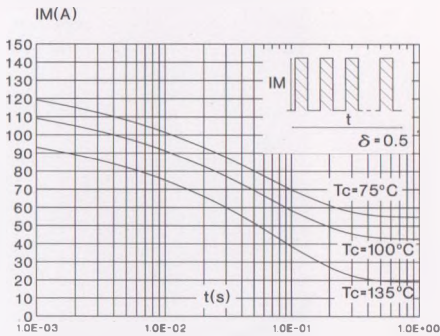
Fig. 5 : Non repetitive surge peak forward current versus overload duration.
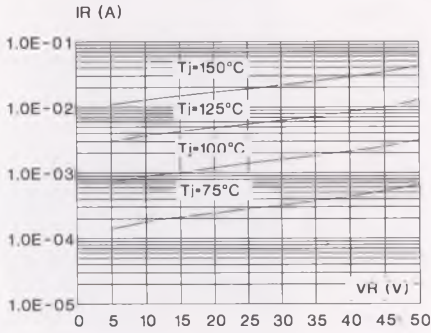(Maximum values) (Per diode) (ISOWATT220AB)

IM(A)

IM
t
δ=0.5

Tc=75°C
Tc=100°C
Tc=120°C
t(s)
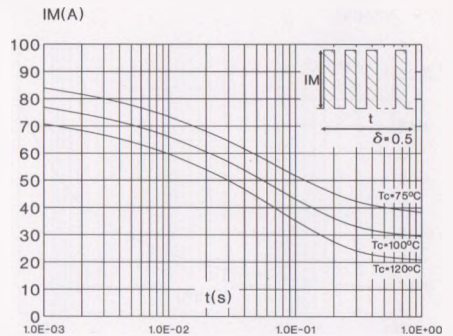
Fig. 6 : Relative variation of thermal transient impedance junction to case versus pulse duration.
(TO220AB)

K

$K=\dfrac{Zth(j-c)\ (tp.\delta)}{Rth(j-c)}$

δ=0.5
δ=0.2
δ=0.1
Single pulse
tp(s)
δ=tp/T ─ tp
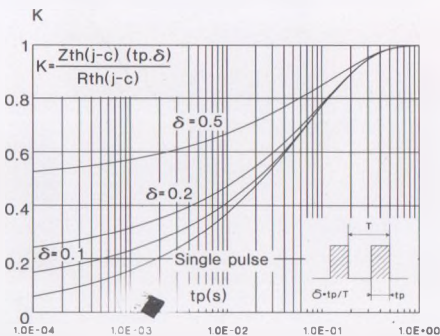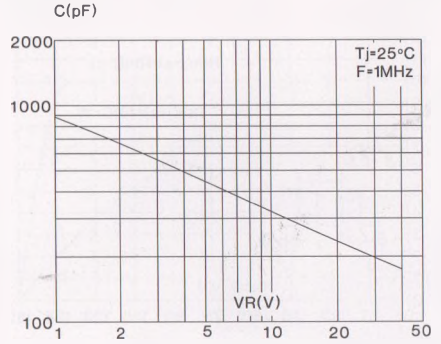
Fig. 7 : Relative variation of thermal transient impedance junction to case versus pulse duration.
(ISOWATT220AB)

K

$K=\dfrac{Zth(j-c)\ (tp.\delta)}{Rth(j-c)}$

δ=0.5
δ=0.2
δ=0.1
Single pulse
tp(s)
δ=tp/T ─ tp

Fig. 8 : Reverse leakage current versus reverse voltage applied. (Typical values) (Per diode)

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

Fig. 10 : Forward voltage drop versus forward current. (Maximum values) (Per diode)

SGS-THOMSON
MICROELECTRONICS