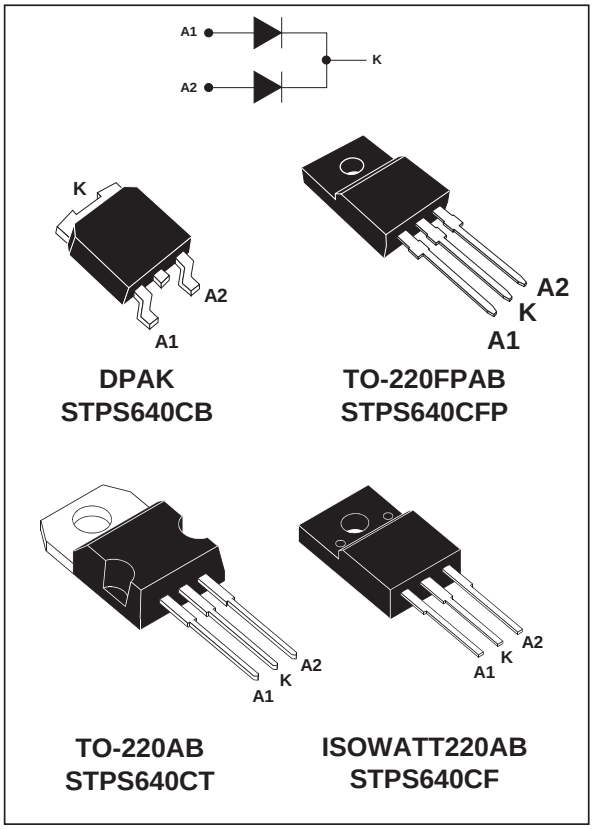
STPS640CT/CF/CB/CFP

POWER SCHOTTKY RECTIFIER

MAIN PRODUCT CHARACTERISTICS

$I_{F(AV)}$	2 x 3 A
V_{RRM}	40 V
Tj (max)	150 °C
V_F (max)	0.57 V



DPAK
STPS640CB

TO-220FPAB
STPS640CFP

TO-220AB
STPS640CT

ISOWATT220AB
STPS640CF

FEATURES AND BENEFITS

- VERY SMALL CONDUCTION LOSSES
- NEGLIGIBLE SWITCHING LOSSES
- EXTREMELY FAST SWITCHING
- LOW FORWARD DROP VOLTAGE
- LOW CAPACITANCE
- LOW THERMAL RESISTANCE
- INSULATED PACKAGE:
  Insulating voltage = 2000V DC
  Capacitance = 12pF
- SMD PACKAGE (tape and reel option: -TR)
- AVALANCHE CAPABILITY SPECIFIED

DESCRIPTION

Dual Schottky rectifier suited to Switch Mode Power Supplies and other Power Converters.

This device is intended for use in low and medium voltage operation, and particulary, in high frequency circuitries where low switching losses are required (free wheeling and polarity protection).

ABSOLUTE RATINGS (limiting values, per diode)

Symbol	Parameter			Value	Unit
V_{RRM}	Repetitive peak reverse voltage			40	V
$I_{F(RMS)}$	RMS forward current	TO-220AB / ISOWATT220AB / TO-220FPAB		10	A
		DPAK		6	
$I_{F(AV)}$	Average forward current $\delta = 0.5$	TO-220AB	Tc = 135°C	3	A
		ISOWATT220AB / TO-220FPAB	Tc = 130°C		
		DPAK	Tc = 120°C		
I_{FSM}	Surge non repetitive forward current	tp = 10 ms Sinusoidal		75	A
I_{RRM}	Repetitive peak reverse current	tp = 2 µs F = 1kHz square		1	A
P_{ARM}	Repetitive peak avalanche power	tp = 1µs Tj = 25°C		1300	W
T_{stg}	Storage temperature range			- 65 to + 150	°C
Tj	Maximum operating junction temperature			150	°C
dV/dt	Critical rate of rise of reverse voltage			10000	V/µs

THERMAL RESISTANCES

Symbol	Parameter			Value	Unit
$R_{th\ (j-c)}$	Junction to case	TO-220AB / DPAK	Per diode Total	5.5 3	°C/W
		ISOWATT220AB / TO-220FPAB	Per diode Total	7.5 5.2	
$R_{th(c)}$	Coupling	TO-220AB		0.5	°C/W
		ISOWATT220AB / TO-220FPAB		3	

When the diodes 1 and 2 are used simultaneously :
Δ Tj(diode 1) = P(diode1) x $R_{th(j-c)}$(Per diode) + P(diode 2) x $R_{th(c)}$

STATIC ELECTRICAL CHARACTERISTICS (per diode)

Symbol	Tests Conditions			Min.	Typ.	Max.	Unit
I_R *	Reverse leakage current	Tj = 25°C	$V_R = V_{RRM}$			100	µA
		Tj = 125°C			2	10	mA
V_F *	Forward voltage drop	Tj = 25°C	I_F = 3 A			0.63	V
		Tj = 25°C	I_F = 6 A			0.84	
		Tj = 125°C	I_F = 3 A		0.5	0.57	
		Tj = 125°C	I_F = 6 A		0.67	0.72	

Pulse test : * tp = 380 µs, δ < 2%

To evaluate the maximum conduction losses use the following equation :
$P = 0.42 \times I_{F(AV)} + 0.050\ I_F{}^2{}_{(RMS)}$

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

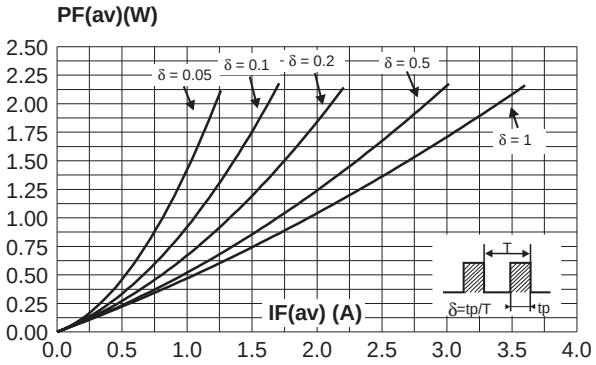


Fig. 2: Average current versus ambient temperature (δ = 0.5, per diode).

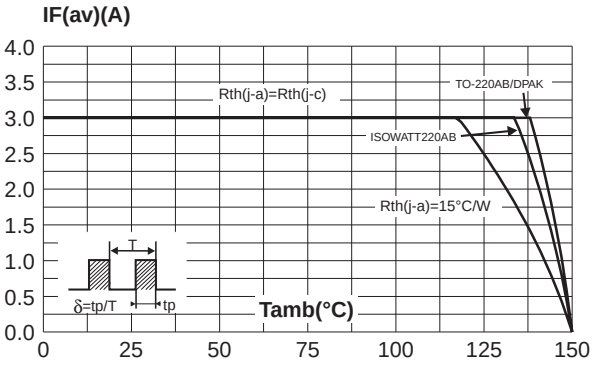


Fig. 3: Normalized avalanche power derating versus pulse duration.

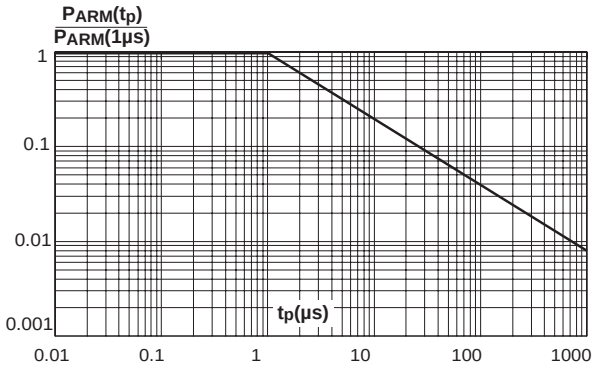


Fig. 4: Normalized avalanche power derating versus junction temperature.

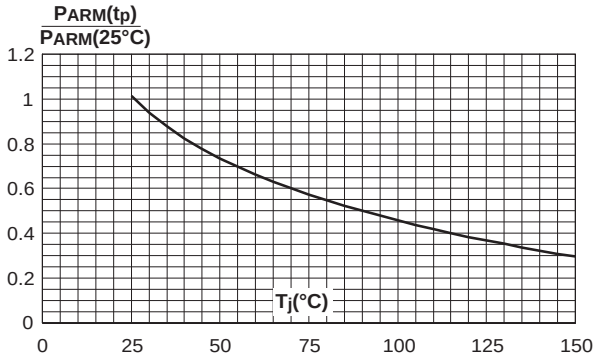


Fig. 5-1: Non repetitive surge peak forward current versus overload duration.
(Maximum values, per diode) (TO-220AB / DPAK).

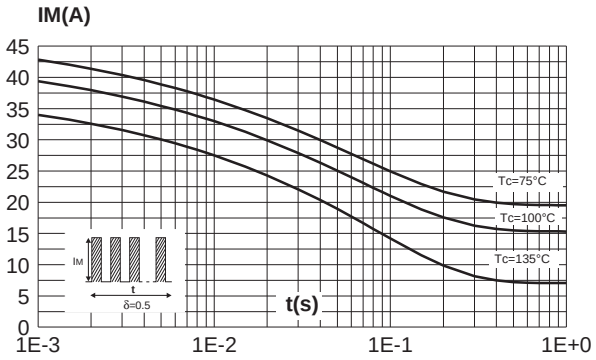


Fig. 5-2: Non repetitive surge peak forward current versus overload duration.
(Maximum values, per diode) (ISOWATT220AB / TO-220FPAB).

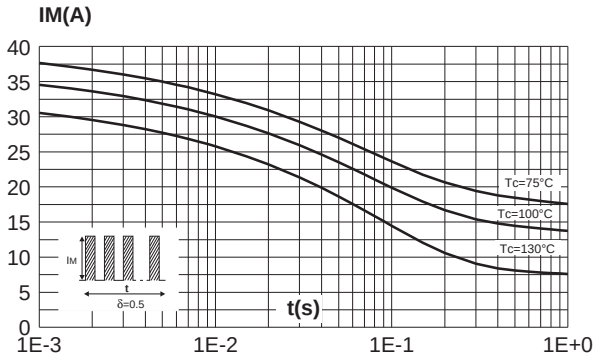


Fig. 6.1: Relative variation of thermal transient impedance junction to case versus pulse duration (TO-220AB / DPAK).

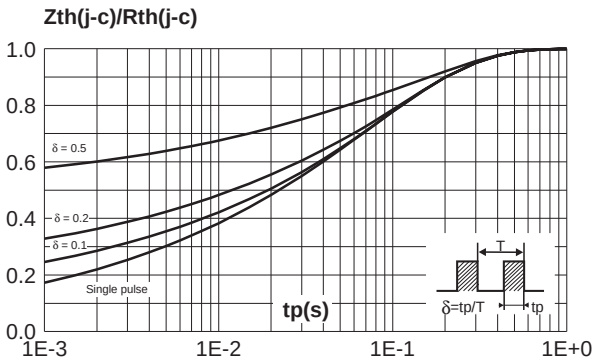


Fig. 6-2: Relative variation of thermal transient impedance junction to case versus pulse duration (ISOWATT220AB / TO-220FPAB).

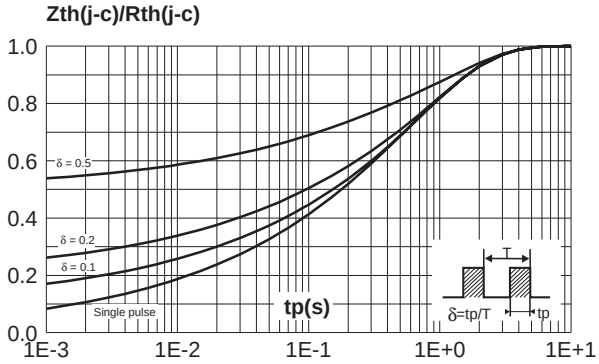


Fig. 7: Reverse leakage current versus reverse voltage applied (typical values, per diode).

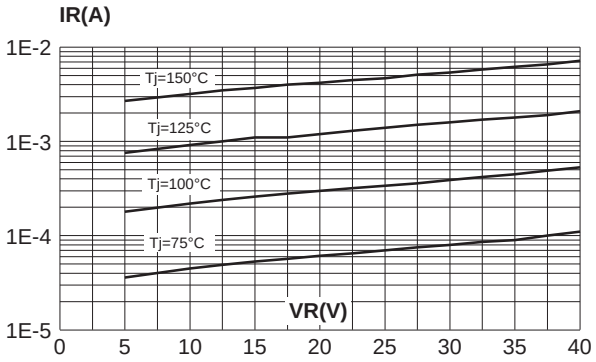


Fig. 8: Junction capacitance versus reverse voltage applied (typical values, per diode).

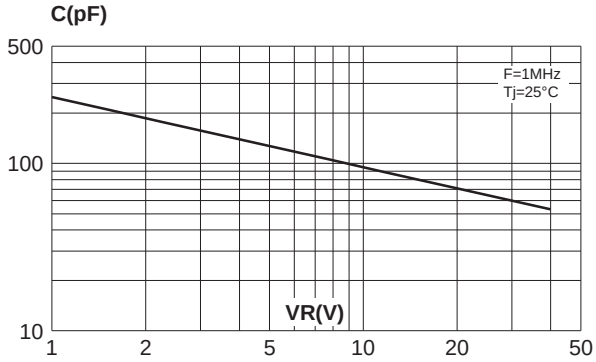


Fig. 9: Forward voltage drop versus forward current (maximum values, per diode).

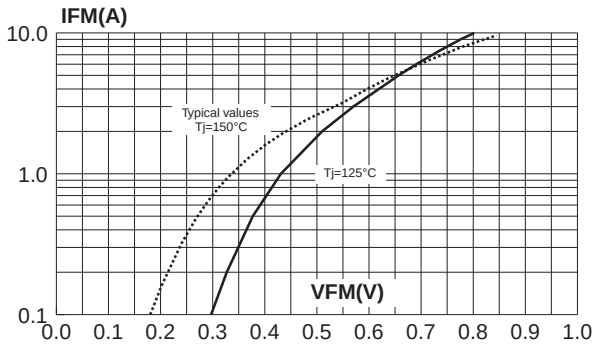
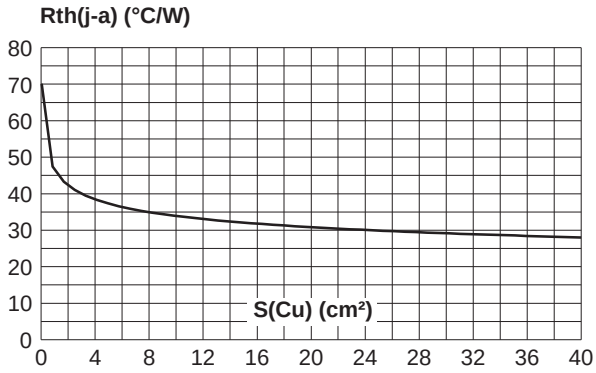
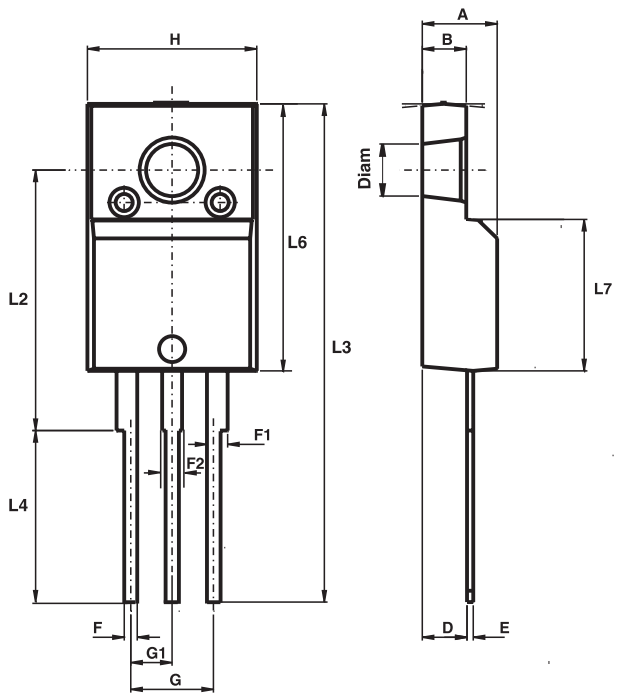


Fig. 10: Thermal resistance junction to ambient versus copper surface under tab (Epoxy printed circuit board FR4, copper thickness: 35µm).

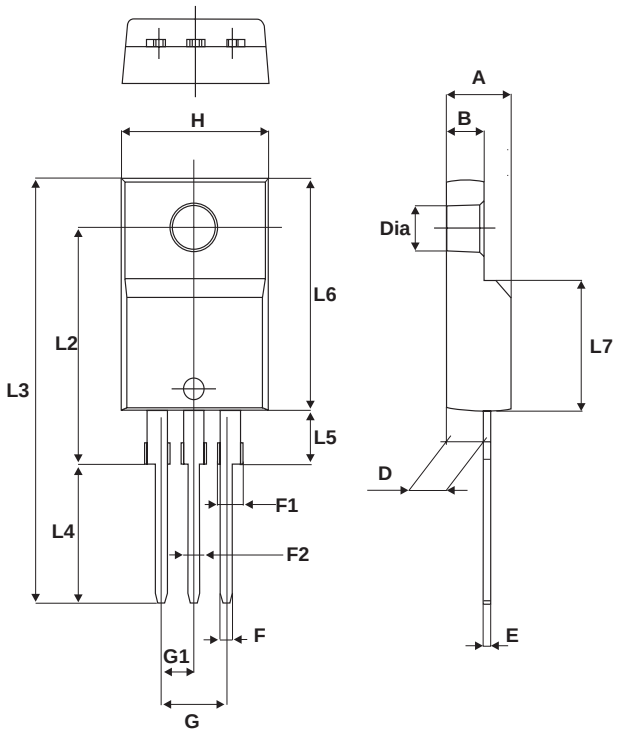


PACKAGE MECHANICAL DATA
ISOWATT220AB



REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.40	4.60	0.173	0.181
B	2.50	2.70	0.098	0.106
D	2.50	2.75	0.098	0.108
E	0.40	0.70	0.016	0.028
F	0.75	1.00	0.030	0.039
F1	1.15	1.70	0.045	0.067
F2	1.15	1.70	0.045	0.067
G	4.95	5.20	0.195	0.205
G1	2.40	2.70	0.094	0.106
H	10.00	10.40	0.394	0.409
L2	16.00 typ.		0.630 typ.	
L3	28.60	30.60	1.125	1.205
L4	9.80	10.60	0.386	0.417
L6	15.90	16.40	0.626	0.646
L7	9.00	9.30	0.354	0.366
Diam	3.00	3.20	0.118	0.126

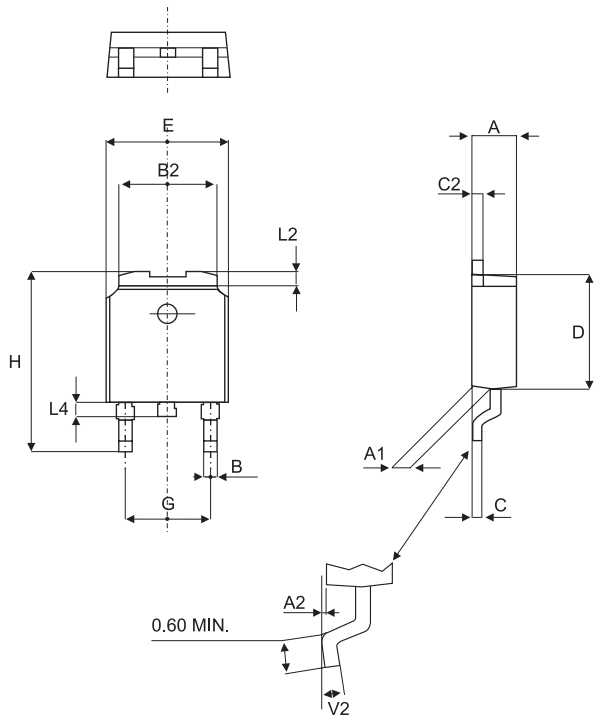
PACKAGE MECHANICAL DATA
TO-220FPAB



REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.4	4.6	0.173	0.181
B	2.5	2.7	0.098	0.106
D	2.5	2.75	0.098	0.108
E	0.45	0.70	0.018	0.027
F	0.75	1	0.030	0.039
F1	1.15	1.70	0.045	0.067
F2	1.15	1.70	0.045	0.067
G	4.95	5.20	0.195	0.205
G1	2.4	2.7	0.094	0.106
H	10	10.4	0.393	0.409
L2	16 Typ.		0.63 Typ.	
L3	28.6	30.6	1.126	1.205
L4	9.8	10.6	0.386	0.417
L5	2.9	3.6	0.114	0.142
L6	15.9	16.4	0.626	0.646
L7	9.00	9.30	0.354	0.366
Dia.	3.00	3.20	0.118	0.126

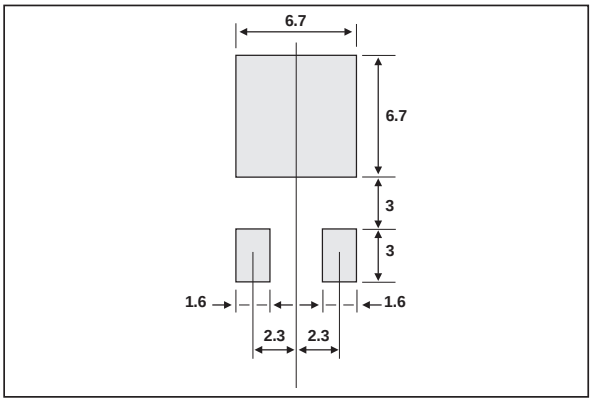
PACKAGE MECHANICAL DATA

DPAK



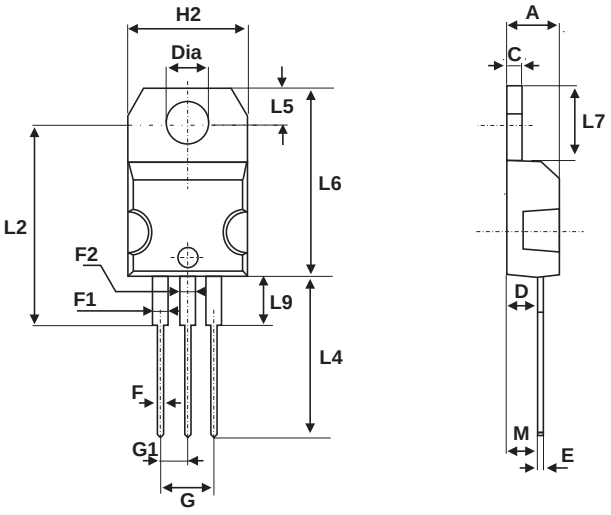
REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max	Min.	Max.
A	2.20	2.40	0.086	0.094
A1	0.90	1.10	0.035	0.043
A2	0.03	0.23	0.001	0.009
B	0.64	0.90	0.025	0.035
B2	5.20	5.40	0.204	0.212
C	0.45	0.60	0.017	0.023
C2	0.48	0.60	0.018	0.023
D	6.00	6.20	0.236	0.244
E	6.40	6.60	0.251	0.259
G	4.40	4.60	0.173	0.181
H	9.35	10.10	0.368	0.397
L2	0.80 typ.		0.031 typ.	
L4	0.60	1.00	0.023	0.039
V2	0°	8°	0°	8°

FOOTPRINT DIMENSIONS (in millimeters)



PACKAGE MECHANICAL DATA

TO-220AB



REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.40	4.60	0.173	0.181
C	1.23	1.32	0.048	0.051
D	2.40	2.72	0.094	0.107
E	0.49	0.70	0.019	0.027
F	0.61	0.88	0.024	0.034
F1	1.14	1.70	0.044	0.066
F2	1.14	1.70	0.044	0.066
G	4.95	5.15	0.194	0.202
G1	2.40	2.70	0.094	0.106
H2	10	10.40	0.393	0.409
L2	16.4 typ.		0.645 typ.	
L4	13	14	0.511	0.551
L5	2.65	2.95	0.104	0.116
L6	15.25	15.75	0.600	0.620
L7	6.20	6.60	0.244	0.259
L9	3.50	3.93	0.137	0.154
M	2.6 typ.		0.102 typ.	
Diam.	3.75	3.85	0.147	0.151

Ordering type	Marking	Package	Weight	Base qty	Delivery mode
STPS640CT	STPS640CT	TO-220AB	2.20g	50	Tube
STPS640CB	S640C	DPAK	0.30g	75	Tube
STPS640CB-TR	S640C	DPAK	0.30g	2500	Tape and reel
STPS640CF	STPS640CF	ISOWATT220AB	2.08g	50	Tube
STPS640CFP	STPS640CFP	TO-220FPAB	2.08g	50	Tube

- Epoxy meets UL94,V0