Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

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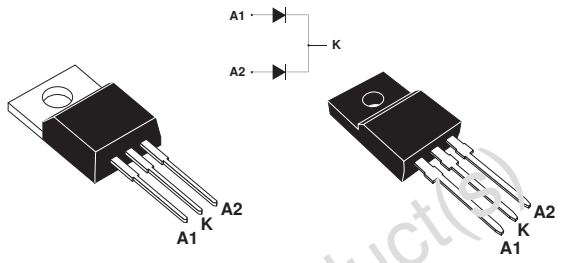
STPR1020CB/CG/CT/CF/CFP/CR

ULTRA-FAST RECOVERY RECTIFIER DIODES

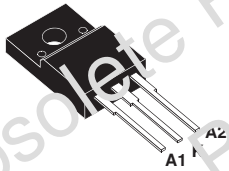
MAIN PRODUCTS CHARACTERISTICS

$I_{F(AV)}$	2 x 5 A
V_{RRM}	200 V
Tj (max)	150°C
V_F (max)	0.99 V
trr (max)	30 ns

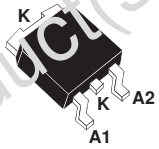


TO-220AB
STPR1020CT

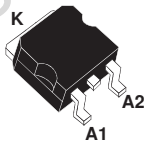
TO-220FPAB
STPR1020CFP



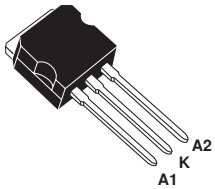
ISOWATT220AB
STPR1020CF



DPAK
STPR1020CB



D^2PAK
STPR1020CG



I^2PAK
STPR1020CR

FEATURES

- SUITED FOR SMPS
- LOW LOSSES
- LOW FORWARD AND REVERSE RECOVERY TIME
- HIGH SURGE CURRENT CAPABILITY
- INSULATED PACKAGES: ISOWATT220AB / TO-220FPAB
  Insulation Voltage = 2000V DC
  Capacitance = 12 pF

DESCRIPTION

Dual center tap rectifier suited for Switched Mode Power Supplies and high frequency DC to DC converters.
Packaged in DPAK, D^2PAK, I^2PAK, TO-220AB, TO-220FPAB or ISOWATT220AB, this device is intended for use in low voltage, high frequency inverters, free wheeling and polarity protection applications.

ABSOLUTE MAXIMUM (limiting values, per diode)

Symbol	Parameter				Value	Unit
V_{RRM}	Repetitive peak reverse voltage				200	V
$I_{F(RMS)}$	RMS forward current	D^2PAK / TO-220AB / ISOWATT220AB / TO-220FPAB / I^2PAK			10	A
		DPAK			7	A
$I_{F(AV)}$	Average forward current $\delta = 0.5$	D^2PAK / DPAK TO-220AB / I^2PAK	Tc=125°C	Per diode	5	A
		ISOWATT220AB	Tc=115°C	Per device	10	
		TO-220FPAB	Tc=110°C	Per device	10	
I_{FSM}	Surge non repetitive forward current		tp=10ms sinusoidal		50	A
T_{stg}	Storage temperature range				- 65 to + 150	°C

THERMAL RESISTANCES

Symbol	Parameter			Value	Unit
$R_{th\ (j-c)}$	Junction to case	TO-220AB / D^2PAK / DPAK / I^2PAK	Per diode	4.0	°C/W
			Total	2.4	
		ISOWATT220AB	Per diode	6.0	
			Total	4.0	
		TO-220FPAB	Per diode	6.5	
			Total	5	
$R_{th\ (c)}$	Coupling	TO-220AB / D^2PAK / DPAK / I^2PAK		0.7	
		ISOWATT220AB		2.0	
		TO-220FPAB		3.5	

When diodes 1 and 2 are used simultaneously :
Δ Tj(diode 1) = P(diode 1) x Rth(j-c) (Per diode) + P(diode 2) x Rth(c)

STATIC ELECTRICAL CHARACTERISTICS (per diode)

Symbol	Parameters	Test conditions		Min.	Typ.	Max.	Unit
I_R *	Reverse leakage current	T_j = 25°C	$V_R = V_{RRM}$			50	µA
		T_j = 100°C				0.6	mA
V_F **	Forward voltage drop	T_j = 125°C	I_F = 5 A		0.8	0.99	V
		T_j = 125°C	I_F = 10 A		0.95	1.20	
		T_j = 25°C	I_F = 10 A			1.25	

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

To evaluate the conduction losses use the following equation :
$P = 0.78 \times I_{F(AV)} + 0.042 \times I_{F^2(RMS)}$

RECOVERY CHARACTERISTICS

Symbol	Test conditions			Min.	Typ.	Max.	Unit
trr	T_j = 25°C	I_F = 0.5A I_R = 1A	Irr = 0.25A			30	ns
tfr	T_j = 25°C	I_F = 1A V_{FR} = 1.1 x V_F max	dI_F/dt = 50 A/µs		20		ns
V_{FP}	T_j = 25°C	I_F = 1A	dI_F/dt = 50 A/µs		3		V

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

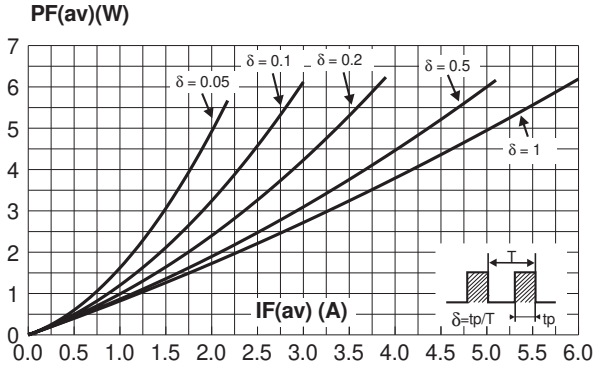


Fig. 2: Peak current versus form factor (per diode).

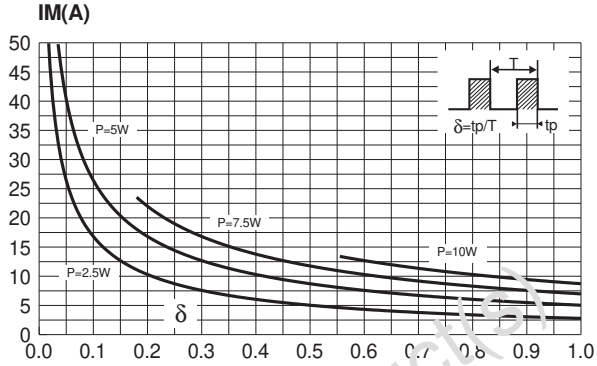


Fig. 3-1: Average forward current versus ambient temperature (δ = 0.5, TO-220AB, DPAK, D^2PAK).

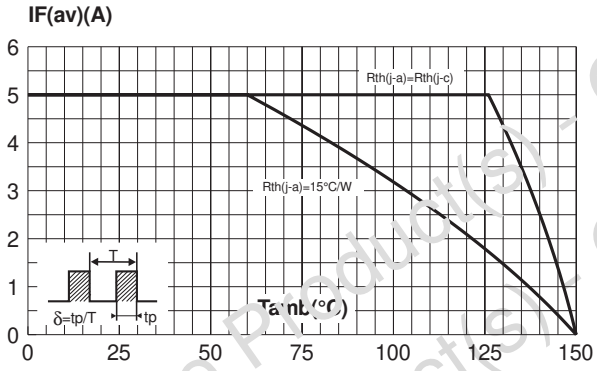


Fig. 3-2: Average forward current versus ambient temperature (δ = 0.5, ISOWATT220AB, TO-220FPAB).

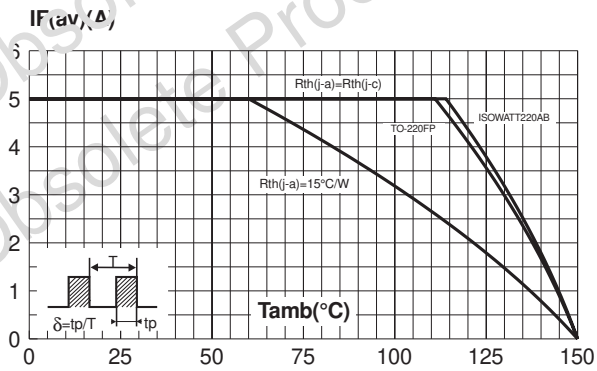


Fig. 4-1: Non repetitive surge peak forward current versus overload duration (TO-220AB, DPAK, D^2PAK).

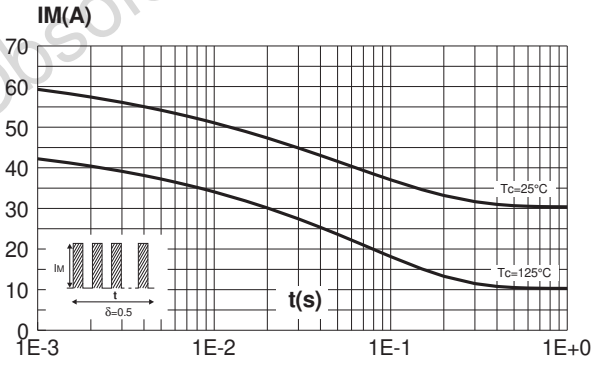


Fig. 4-2: Non repetitive surge peak forward current versus overload duration (ISOWATT220AB).

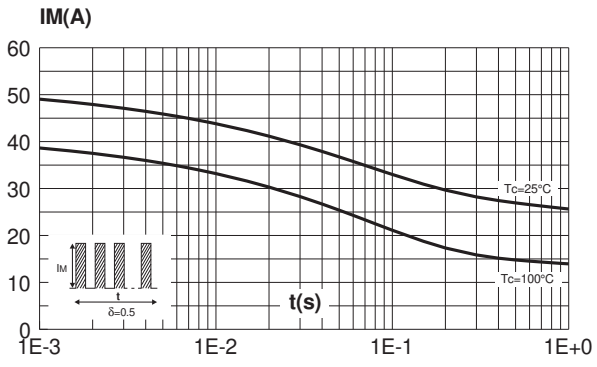


Fig. 4-3: Non repetitive surge peak forward current versus overload duration (TO-220FPAB).

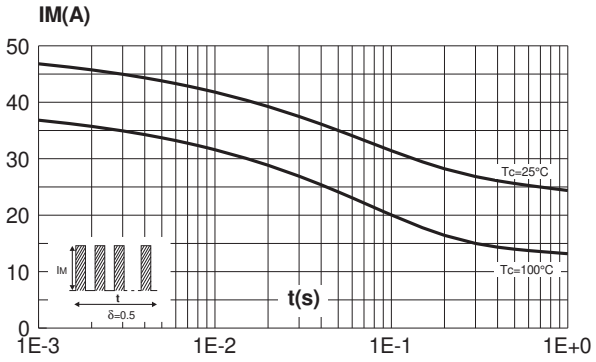


Fig. 5-1: Relative variation of thermal impedance junction to case versus pulse duration (D^2PAK, DPAK, TO-220AB).

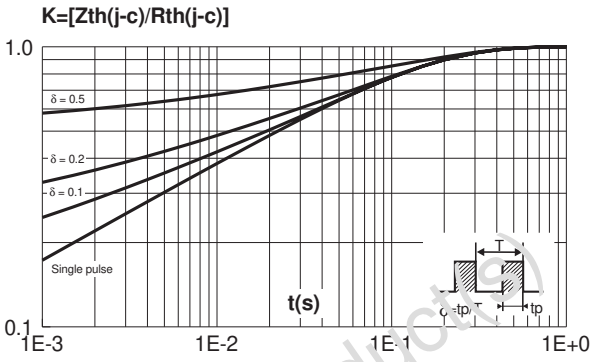


Fig. 5-2: Relative variation of thermal impedance junction to case versus pulse duration (ISOWATT220AB, TO-220FPAB).

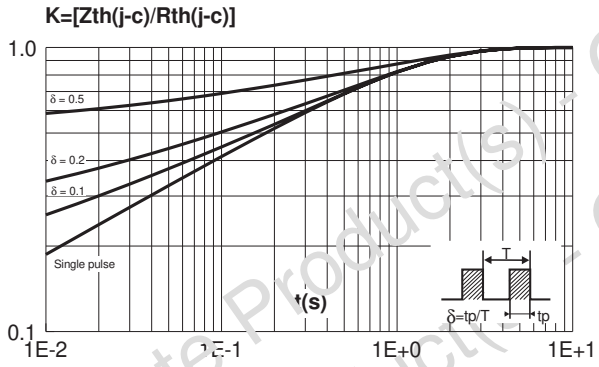


Fig. 6: Forward voltage drop versus forward current (maximum values, per diode).

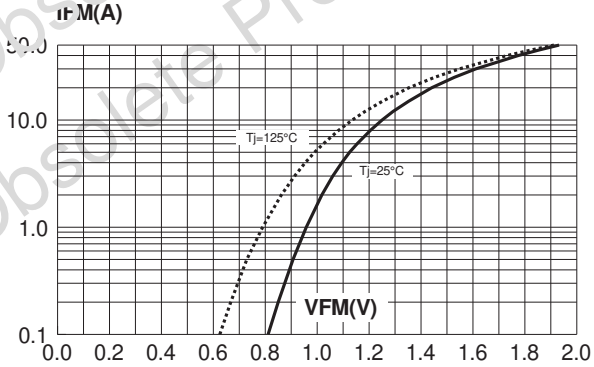


Fig. 7: Junction capacitance versus reverse voltage applied (typical values, per diode).

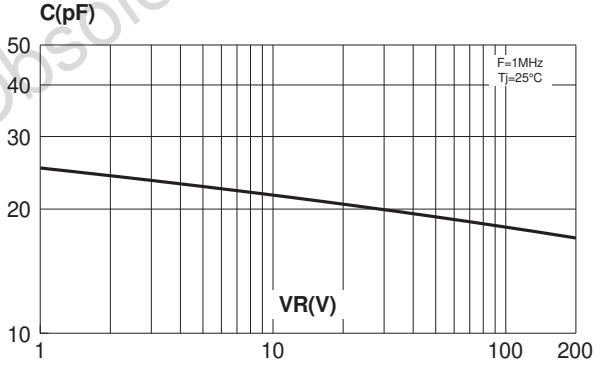


Fig. 8: Reverse recovery charges versus dIF/dt (per diode).

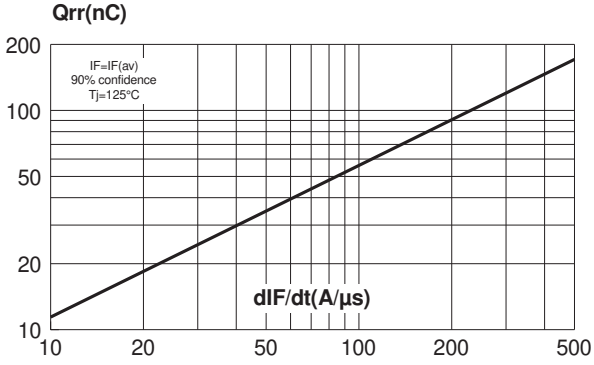


Fig. 9: Peak reverse recovery current versus dIF/dt (per diode).

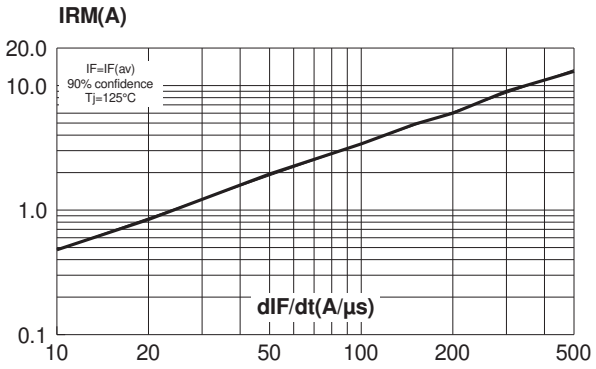


Fig. 10: Dynamic parameters versus junction temperature (per diode).

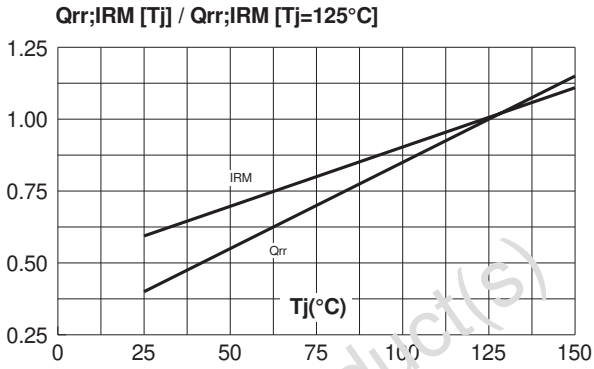
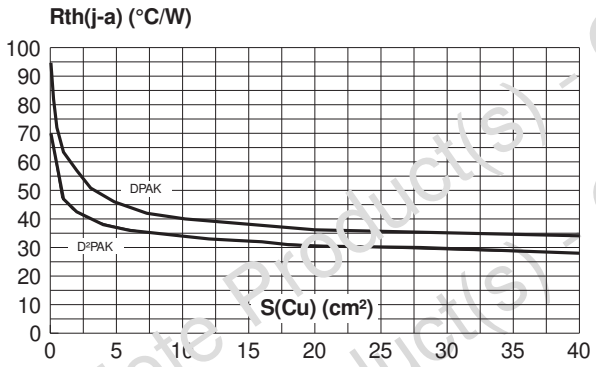
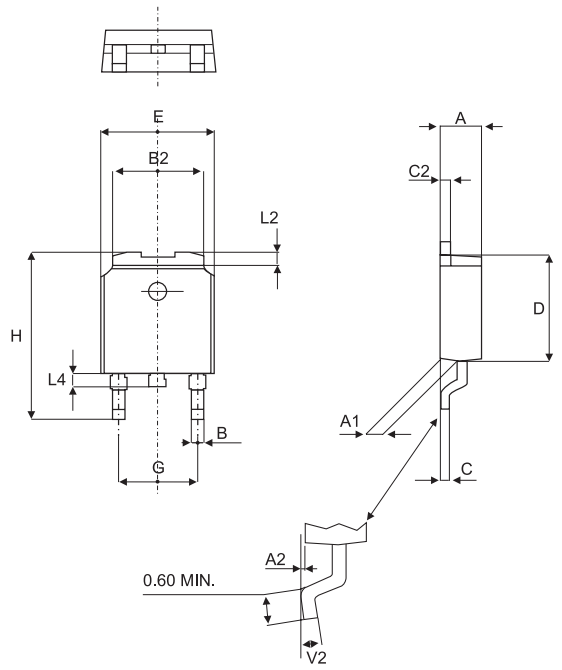


Fig. 11: Thermal resistance junction to ambient versus copper surface under tab (Epoxy printed circuit board FR4, copper thickness: 35µm).



PACKAGE MECHANICAL DATA

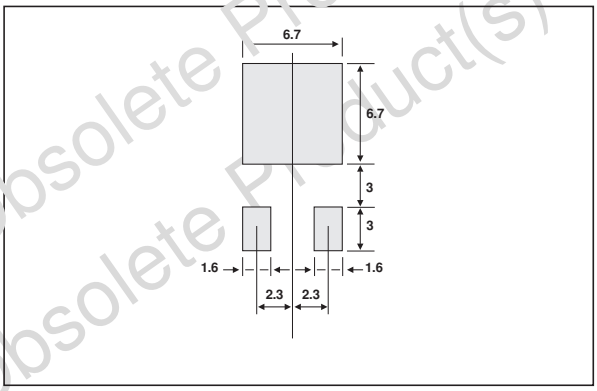
DPAK



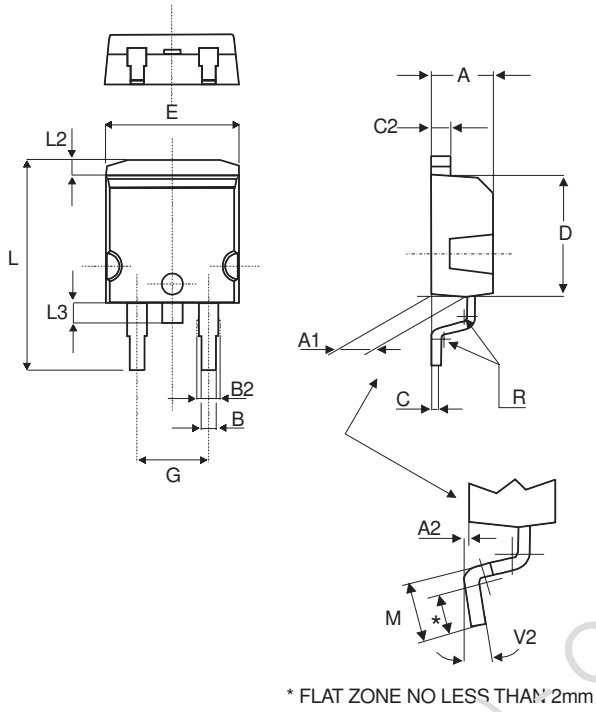
REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max	Min.	Max.
A	2.20	2.40	0.086	0.094
A1	0.90	1.10	0.035	0.043
A2	0.03	0.23	0.001	0.009
B	0.64	0.90	0.025	0.035
B2	5.20	5.40	0.204	0.212
C	0.45	0.60	0.017	0.023
C2	0.48	0.60	0.018	0.023
D	6.00	6.20	0.236	0.244
E	6.40	6.60	0.251	0.259
G	4.40	4.60	0.173	0.181
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°

FOOT PRINT (in milliteters)

DPAK



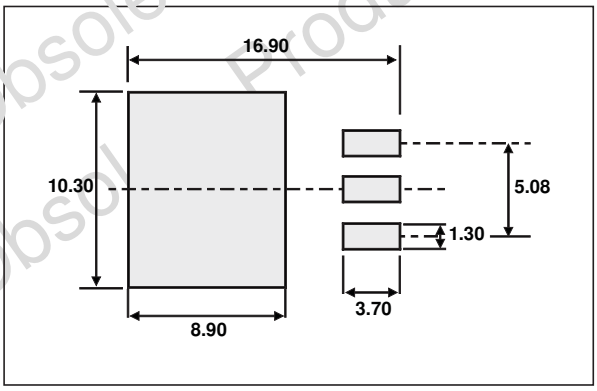
PACKAGE MECHANICAL DATA
D^2PAK



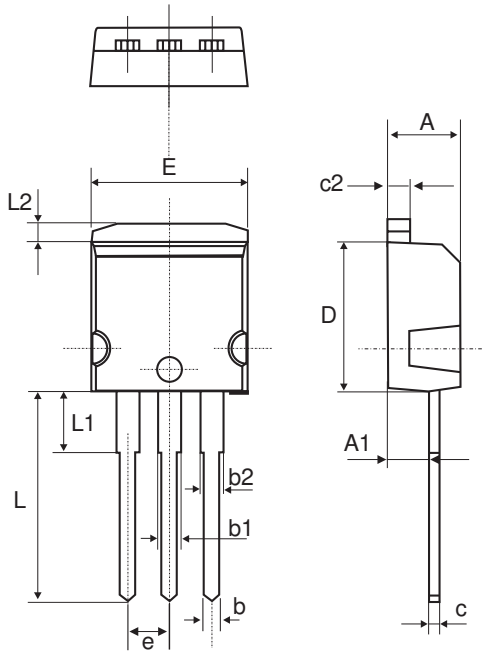
* FLAT ZONE NO LESS THAN 2mm

REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.40	4.60	0.173	0.181
A1	2.49	2.69	0.098	0.106
A2	0.03	0.23	0.001	0.009
B	0.70	0.93	0.027	0.037
B2	1.14	1.70	0.045	0.067
C	0.45	0.60	0.017	0.024
C2	1.23	1.36	0.048	0.054
D	8.95	9.35	0.352	0.368
E	10.00	10.40	0.393	0.409
G	4.88	5.28	0.192	0.208
L	15.00	15.85	0.590	0.624
L2	1.27	1.40	0.050	0.055
L3	1.40	1.75	0.055	0.069
M	2.40	3.20	0.094	0.126
R	0.40 typ.		0.016 typ.	
V2	0°	8°	0°	8°

FOOT PRINT (in millimeters)
D^2PAK

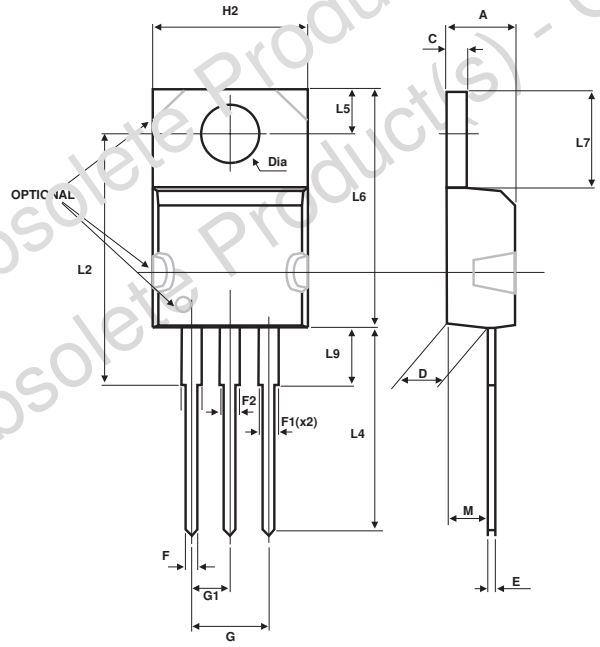


PACKAGE MECHANICAL DATA
I^2PAK



REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.40	4.60	0.173	0.181
A1	2.49	2.69	0.098	0.106
b	0.70	0.93	0.028	0.037
b1	1.14	1.17	0.044	0.046
b2	1.14	1.17	0.044	0.046
c	0.45	0.60	0.018	0.024
c2	1.23	1.36	0.048	0.054
D	8.95	9.35	0.352	0.368
e	2.40	2.70	0.094	0.106
E	10.0	10.4	0.394	0.409
L	13.1	13.6	0.516	0.535
L1	3.48	3.78	0.137	0.149
L2	1.27	1.40	0.050	0.055

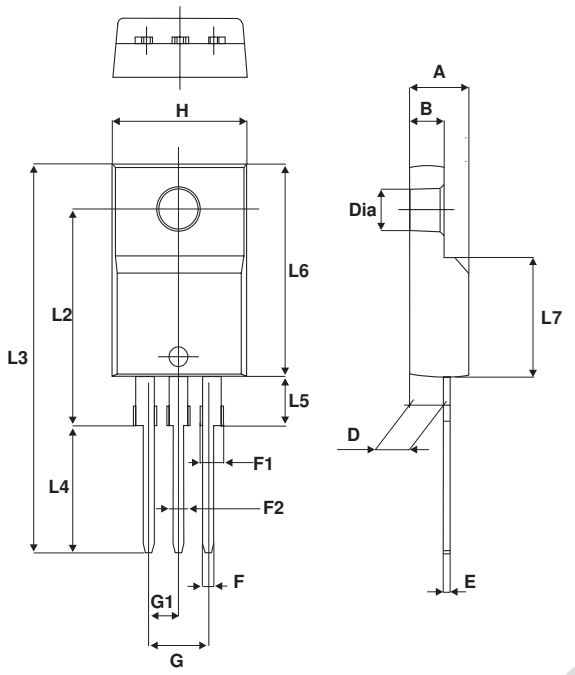
PACKAGE MECHANICAL DATA
TO-220AB (JEDEC compatible)



REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.30	4.60	0.169	0.181
C	1.22	1.32	0.048	0.052
D	2.40	2.72	0.094	0.107
E	0.33	0.70	0.013	0.028
F	0.61	0.93	0.024	0.037
F1	1.14	1.70	0.045	0.067
F2	1.14	1.70	0.045	0.067
G	4.95	5.15	0.195	0.202
G1	2.40	2.70	0.094	0.106
H2	10.00	10.40	0.394	0.409
L2	16.00 Typ.		0.630 Typ.	
L4	13.00	14.00	0.512	0.551
L5	2.65	2.95	0.104	0.116
L6	14.80	15.75	0.583	0.620
L7	6.20	6.60	0.244	0.260
L9	3.40	3.94	0.134	0.155
M	2.60 Typ.		0.102 Typ.	
Dia.	3.75	3.89	0.148	0.153

PACKAGE MECHANICAL DATA

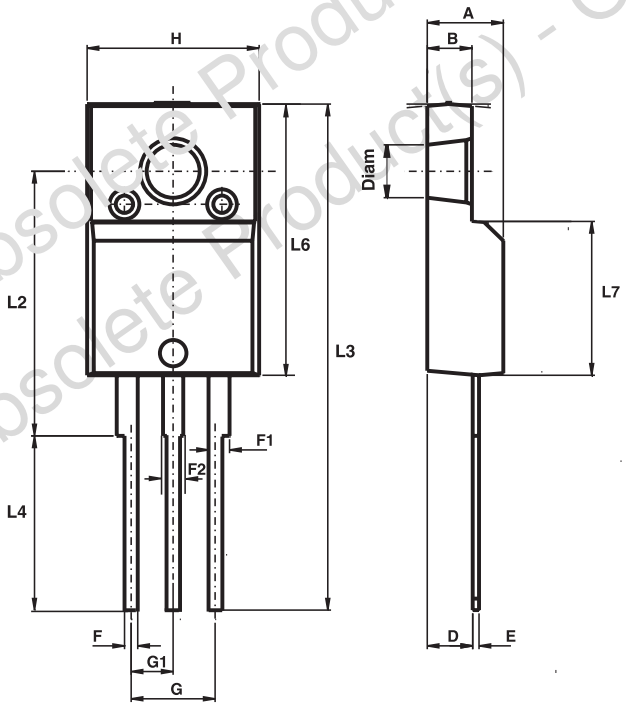
TO-220FPAB



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

ISOWATT220AB (JEDEC compatible)



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

Ordering type	Marking	Package	Weight	Base qty	Delivery mode
STPR1020CB	STPR1020CB	DPAK	0.3g	75	Tube
STPR1020CB-TR	STPR1020CB	DPAK	0.3g	2500	Tape & reel
STPR1020CT	STPR1020CT	TO-220AB	2.23g	50	Tube
STPR1020CF	STPR1020CF	ISOWATT220AB	2.2g	50	Tube
STPR1020CG	STPR1020CG	D^2PAK	1.48g	50	Tube
STPR1020CFP	STPR1020CFP	TO-220FP	2.0g	50	Tube
STPR1020CR	STPR1020CR	I^2PAK	1.49 g	50	Tube

- Cooling method : by conduction (C)
- Recommended torque value (ISOWATT220AB, TO-220FPAB): 0.55 N.m.
- Maximum torque value (ISOWATT220AB, TO-220FPAB): 0.70 N.m.
- Recommended torque value (TO-220AB): 0.8 N.m
- Maximum torque value (TO-220AB): 1.0 N.m.
- Epoxy meets UL94,V0