F04 Series 4A TRIACs

FEATURES

- Glass Passivated Junctions
- High voltage and surge capability
- Low Thermal Resistance and Durability
- Triggering in all four quadrants

APPLICATIONS

- Static relays
- Heating regulation
- In-duction motor starting circuits
- Phase control operation in light dimmers
- Motor speed controllers

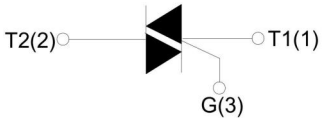
SMD Device Halogen Free

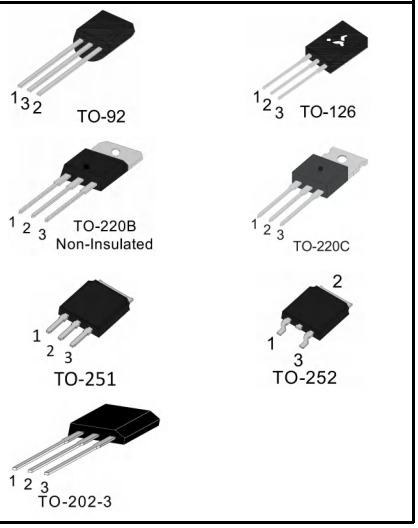
Pb-free

RoHS COMPLIANT

Parameters Summary

VD/VR:600/800V IT(RMS):4A IGT:3mAto10mA





ABSOLUTE MAXIMUM RATINGS

Parameter		Symbol	Value	Unit
Storage junction temperature range		Tstg	-40 ~150	℃
Operating junction temperature range		Tj	-40~125	℃
Repetitive peak off-state voltage (T =25℃)		V_{DRM}	600/800	V
Repetitive peak reverse voltage (T =25℃)		V_{RRM}	600/800	V
Non repetitive surge peak Off-state voltage		V_{DSM}	V_{DRM} +100	V
Non repetitive peak reverse voltage		V_{RSM}	V_{RRM} +100	V
RMS on-state current	TO-251/TO-252 (TC=110℃)	$I_{T(RMS)}$	4	A
	TO-220B/TO-220C(TC=103℃)			
	TO-126(TC=100℃)			
	TO-92(TC=70℃)			
	TO-202-3(TC=80℃)			
Non repetitive surge peak on-state current (180° conduction angle, F=50Hz)		I_{TSM}	30	A
I^2t value for fusing (tp=10ms)		I^2t	3. 1	A^2S
Critical rate of rise of on-state current (I =2×IGT, tr ≤ 100 ns)	I-II-III	di/dt	50	A/μS
	IV		10	
Peak gate current		I_{GM}	2	A
Average gate power dissipation		$P_{G(AV)}$	0. 5	W

Thermal Resistances

Symbol	Parameter		Value	Unit
Rth(j-c)	Junction to case (AC)	TO-251/TO-252	3. 7	℃/W
		TO-220B/TO-220C	3. 1	
		TO-202-3	4. 5	
		TO-126	4. 1	
		TO-92	15	

ELECTRICAL CHARACTERISTICS (T=25℃unless otherwise specified)							
Symbol	Test Condition	Quadrant		Value			Unit
				03	05	10	
I_{GT}	VD=12V	I-II-III	MAX	3	5	10	mA
		IV		5	10	25	V
V_{GT}		ALL	MAX	1.3			
V_{GD}	VD=VDRM Tj=125℃	ALL	MIN	0.2			V
I_L	I_G=1.2I_{GT}	I-III-IV	MAX	8	10	20	mA
		II		12	15	35	
I_H	IT=100mA		MAX	5	10	20	mA
dV/dt	V_D=2/3V_{DRM} Gate Open Tj=125℃		MIN	20	50	100	V/μs

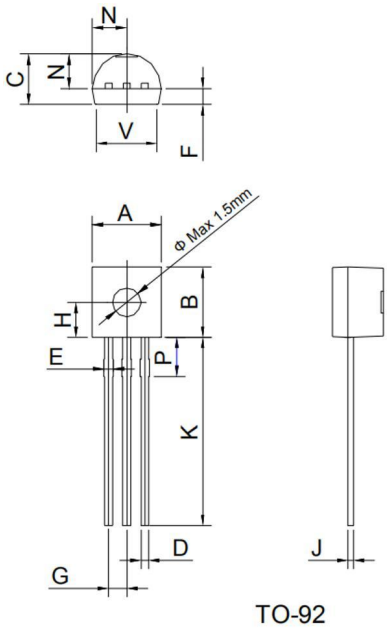
STATIC CHARACTERISTICS				
Symbol	Parameter		Value(MAX.)	Unit
V_{TM}	ITM =5.5A tp=380μs	Tj =25℃	1.65	V
I_{DRM}	V_D=V_{DRM} V_R=V_{RRM}	Tj =25℃	5	μA
I_{RRM}		Tj =125℃	1	mA

Ordering Information Scheme

F 04 05 - 8 U

- F: F:4Q
- 04: IT(RMS):4A
- 05: 03:IGT≤3mA; 05:IGT≤5mA; 10:IGT≤10mA
- 8: 6:VD/VR≥600V; 8:VD/VR≥800V
- U: B:TO-220B C:TO-220C H:TO-251 D:TO-252 Q:TO-126 G:TO-202-3 U:TO-92

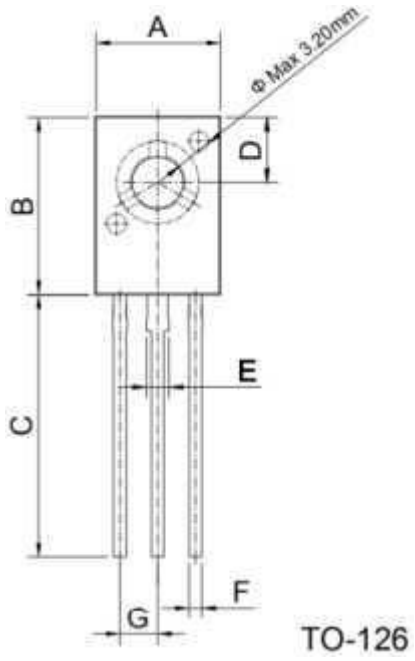
TO-92 Package Mechanical Data



TO-92

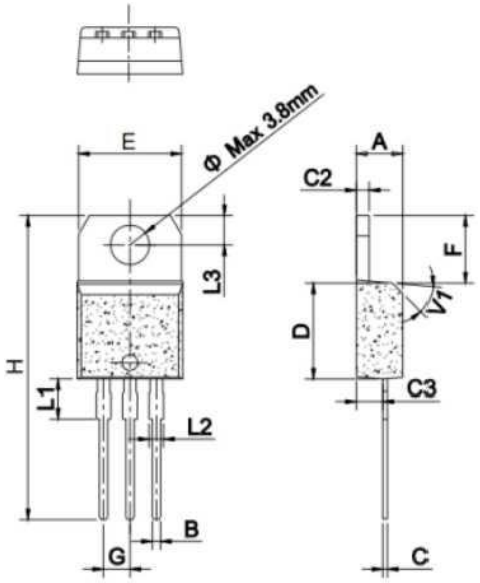
Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.45		5.20	0.175		0.205
B	4.32		5.33	0.170		0.210
C	3.18		4.19	0.125		0.165
D	0.254		0.506	0.016		0.021
E	0.30		0.70	0.024		0.031
F	.	1.30	.	.	0.051	-
G	.	1.27	.	.	0.050	-
H	.	2.30	.	.	0.091	-
J	0.30		0.50	0.011		0.020
K	12.70		15.0	0.500		0.591
N	2.04		2.66	0.080		0.105
P	1.86		2.06	0.073		0.081
V	.		4.50	.		0.169

TO-126 Package Mechanical Data



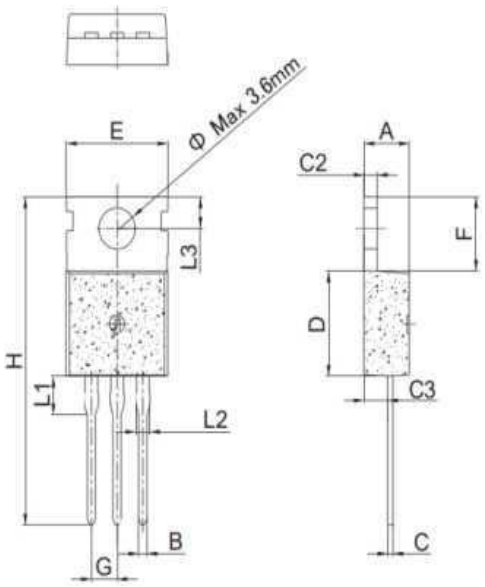
Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	7.40		7.80	0.291		0.307
B	10.6		11.2	0.417		0.441
C	15.3		16.3	0.602		0.642
D	3.90		4.10	0.154		0.161
E	1.17		1.47	0.046		0.058
F	0.66		0.86	0.026		0.034
G		2.29			0.090	
H	2.50		2.90	0.098		0.114
J	1.10		1.50	0.043		0.059
K	0.45		0.60	0.018		0.024

TO-220B Package Mechanical Data



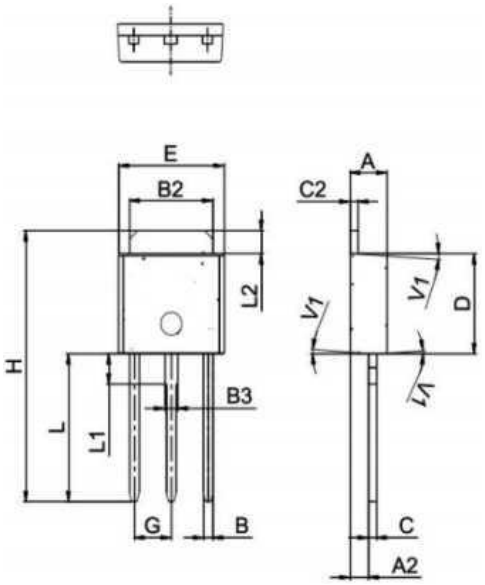
Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.10		4.30	0.173		0.181
B	0.61		0.88	0.024		0.035
C	0.46		0.70	0.018		0.028
C2	1.21		1.32	0.048		0.052
C3	2.40		2.72	0.094		0.107
D	8.60		9.70	0.339		0.382
E	9.60		10.4	0.378		0.409
F	6.25		7.05	0.244		0.260
G		2.54			0.1	
H	28.0		29.8	1.102		1.173
L1					0.148	
L2	1.14		1.70	0.045		0.067
L3	2.65		2.95	0.104		0.116
V1		45			45	

TO-220C Package Mechanical Data



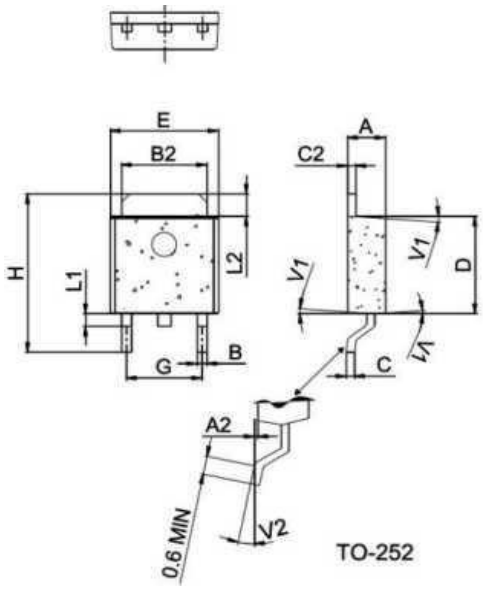
Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.40		4.60	0.173		0.181
B	0.70		0.90	0.028		0.035
C	0.45		0.60	0.018		0.024
C2	1.30		1.48	0.048		0.052
C3	2.20		2.60	0.087		0.102
D	8.90		9.90	0.350		0.390
E	9.90		10.3	0.390		0.406
F	6.30		6.90	0.248		0.272
G		2.54			0.1	
H	28.0		29.8	1.102		1.173
L1		3.39			0.133	
L2	1.14		1.70	0.045		0.067
L3	2.65		2.95	0.104		0.116
e		3.6			0.142	

TO-251 Package Mechanical Data



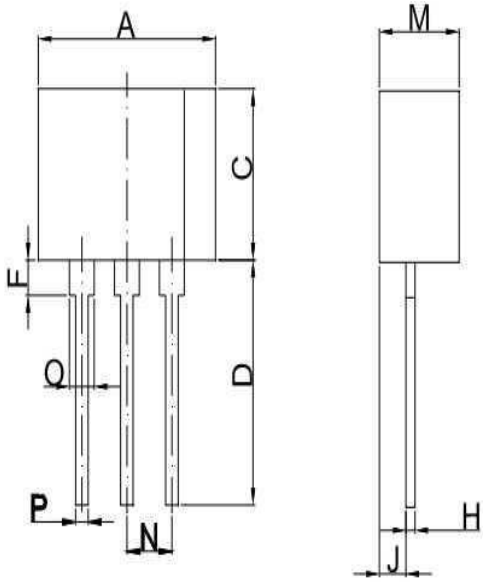
Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.20		2.40	0.086		0.095
A2	0.90		1.50	0.035		0.059
B	0.55		0.65	0.022		0.026
B2	5.10		5.40	0.200		0.213
B3	0.76		0.85	0.030		0.033
C	0.45		0.62	0.018		0.024
C2	0.66		0.94	0.025		0.037
D	6.00		6.20	0.236		0.244
E	6.40		6.70	0.252		0.264
G		2.30				
H	15.25		15.65	0.600		0.616
L	7.8		8.8	0.307		0.346
L1	1.50		1.90	0.059		0.075
L2	1.10		1.50	0.043		0.059
V1		4			4	

TO-252 Package Mechanical Data



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.20		2.40	0.086		0.095
A2	0.03		0.23	0.001		0.009
B	0.55		0.65	0.022		0.026
B2	5.10		5.40	0.200		0.213
C	0.45		0.62	0.018		0.024
C2	0.71		0.99	0.019		0.024
D	6.00		6.20	0.236		0.244
E	6.40		6.70	0.252		0.264
G	4.40		4.70	0.173		0.185
H	9.35		10.60	0.368		0.417
L1	1.30		1.70	0.051		0.067
L2	1.37		1.50	0.054		0.059
V1		4				
V2	0		8	0		8

TO-202-3 Package Mechanical Data



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	9.30		9.90	0.366		0.390
C	7.0		7.6	0.276		0.299
D	10.5		11.5	0.413		0.453
F	1.50		2.50	0.059		0.098
H	0.45		0.55	0.018		0.022
J	1.50		1.90	0.059		0.075
M	4.40	2.54	4.70	0.173	0.100	0.185
N	1.20		1.50	0.047		0.059
O	0.60		0.80	0.024		0.031
P	9.30		9.90	0.366		0.390

FIG.1 Maximum power dissipation versus on-state current

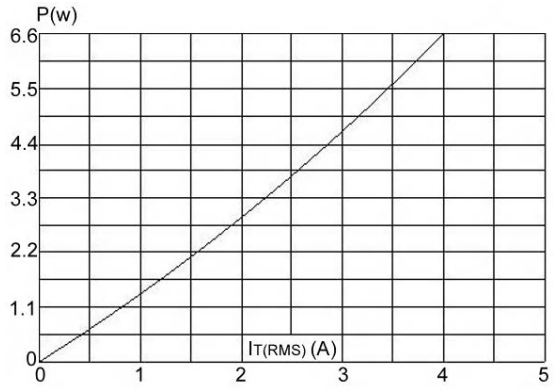


FIG.2: on-state current versus case temperature

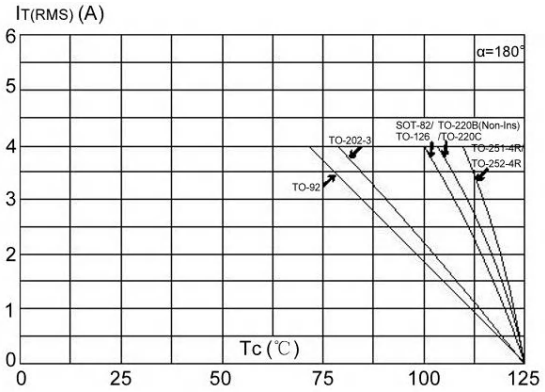


FIG.3: Surge peak on-state current versus number of cycles

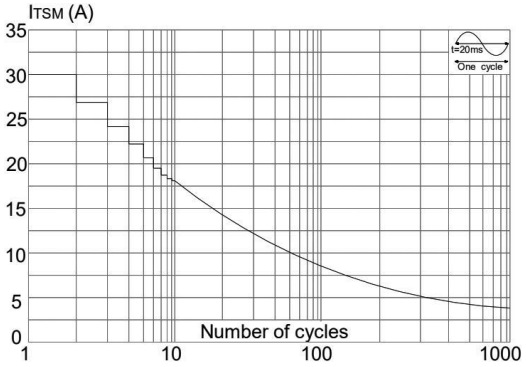


FIG.4: On-state characteristics (maximum values)

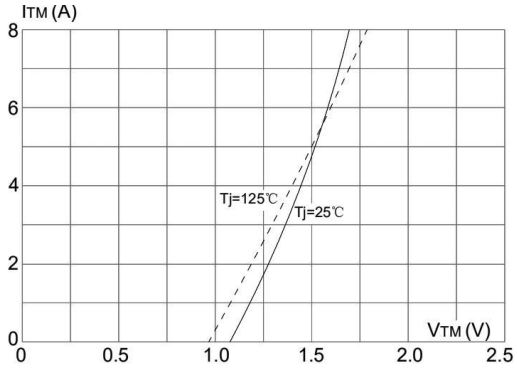


FIG.5: Non-repetitive surge peak on-state currentfor a sinusoidal pulse with width tp<10ms, and corresponding value of I2 t (dI/dt < 50A/µs)

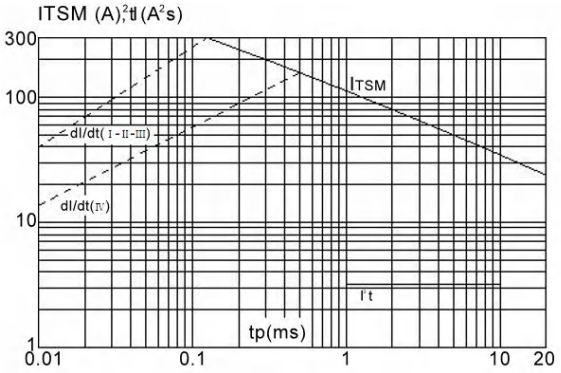
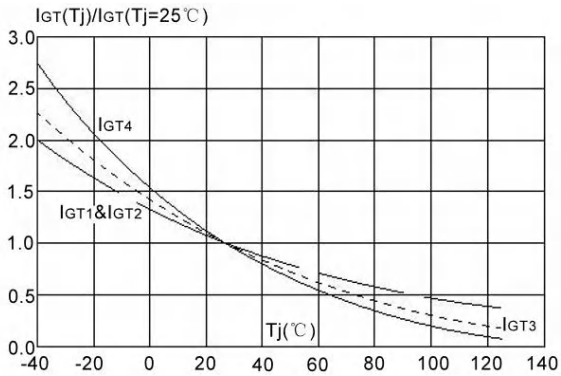


FIG.6: Relative variations of gate trigger current holding current and latching current versus junction temperature



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