

40A SCR's

Features

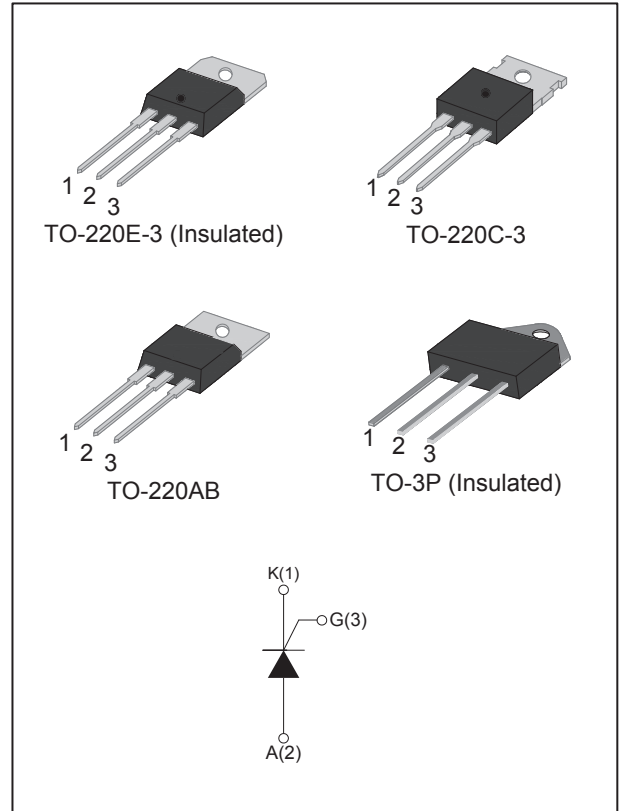
- Glass passivated chip junction
- High thermal cycling performance
- High voltage capacity
- Very high current surge capability
- Pb-free
- RoHS compliant

Applications

- Line rectifying 50/60 Hz
- Softstart AC motor control
- DC Motor control
- Power converter
- AC power control
- Lighting and temperature control

Main Features

Symbol	Value	Unit
$I_{T(RMS)}$	40	A
V_{DRM} / V_{RRM}	800 / 1200 / 1600	V



Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Storage junction temperature range	T_{STG}	-40 to 150	°C
Operating junction temperature range	T_J	-40 to 125	°C
Repetitive peak off-state voltage ($T_J = 25^\circ\text{C}$)	V_{DRM}	800 / 1200 / 1600	V
Repetitive peak reverse voltage ($T_J = 25^\circ\text{C}$)	V_{RRM}	800 / 1200 / 1600	V
RMS on-state current	TO-220E-3(Ins) ($T_C=85^\circ\text{C}$)	40	A
	TO-220C-3 ($T_C=95^\circ\text{C}$)		
	TO-220AB ($T_C=95^\circ\text{C}$)		
	TO-3P(Ins) ($T_C=80^\circ\text{C}$)		
Non repetitive surge peak on-state current (180° conduction angle, $F = 50\text{Hz}$, $t_P = 10\text{ms}$, half full cycle)	I_{TSM}	420	A
I^2t value for fusing ($t_P = 10\text{ms}$)	I^2t	880	A ² s
Critical rate of rise of on-state current ($I_G = 2 \times I_{GT}$, $t_r \leq 100\text{ns}$)	di/dt	150	A/ μs
Peak gate current	I_{GM}	4	A
Average gate power dissipation	$P_{G(AV)}$	5	W

Electrical Characteristics ($T_J = 25^\circ\text{C}$ unless otherwise specified)

Symbol	Test Condition		Value	Unit
I_{GT}	$V_D = 12\text{V}, R_L = 100\Omega$	MAX	40	mA
V_{GT}	$V_D = 12\text{V}, R_L = 100\Omega$	MAX	1.5	V
V_{GD}	$V_D = V_{DRM}, T_J = 125^\circ\text{C}$	MIN	0.2	V
I_L	$I_G = 1.2 \times I_{GT}$	MAX	200	mA
I_H	$V_{AK} = 12\text{V}, I_{GK} = 100\text{mA}$	MAX	100	mA
dV/dt	$V_D = 67\% V_{DRM}, \text{Gate open}, T_J = 125^\circ\text{C}$	MIN	1000	V/ μs

Static Characteristics

Symbol	Test Condition		Value	Unit
V_{TM}	$I_{TM} = 60\text{A}, t_p = 380\mu\text{s}$	$T_J = 25^\circ\text{C}$ MAX	1.5	V
I_{DRM} I_{RRM}	$V_D = V_{DRM}, V_R = V_{RRM}$	$T_J = 25^\circ\text{C}$ MAX	10	μA
		$T_J = 125^\circ\text{C}$ MAX	4	mA

Thermal Resistances

Symbol	Parameter	Value	Unit
$R_{\theta JC}$	Junction to case(AC)	TO-220E-3(Ins)	1.2
		TO-220C-3	0.8
		TO-220AB	0.8
		TO-3P(Ins)	0.7

Ordering Information

Ordering Type	Marking	Package	Quantity	Delivery Mode
CR40xx-800EI	CR40xx-800EI	TO-220E-3(Ins)	50	Tube
CR40xx-800C	CR40xx-800C	TO-220C-3	50	Tube
CR40xx-800T	CR40xx-800T	TO-220AB	50	Tube
CR40xx-800ZI	CR40xx-800ZI	TO-3P(Ins)	30	Tube
SCR40xx-yyEI	SCR40xx-yyEI	TO-220E-3(Ins)	50	Tube
SCR40xx-yyC	SCR40xx-yyC	TO-220C-3	50	Tube
SCR40xx-yyT	SCR40xx-yyT	TO-220AB	50	Tube
SCR40xx-yyZI	SCR40xx-yyZI	TO-3P(Ins)	30	Tube

Note : xx = sensitivity, yy = voltage

Ordering Information Scheme

SCR 40 40 - 12 C

SCR series

CR = SCRs (999V ↓)
 SCR = SCRs (1000V ↑)

$I_{T(RMS)}$

40 = 40A

I_{GT} Sensitivity

40 = 40mA

V_{DRM} / V_{RRM}

800 = 800V
 12 = 1200V
 16 = 1600V

Package type

EI = TO-220E-3(Ins)
 C = TO-220C-3
 T = TO-220AB
 ZI = TO-3P(Ins)

Ratings and Characteristics Curves

Fig.1 - RMS on-state current versus case temperature

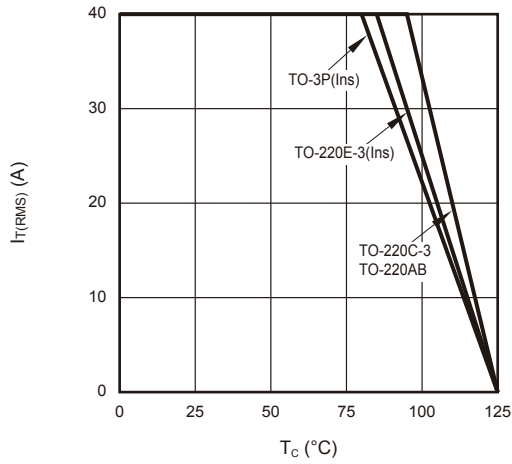


Fig.2 - Surge peak on-state current versus number of cycles

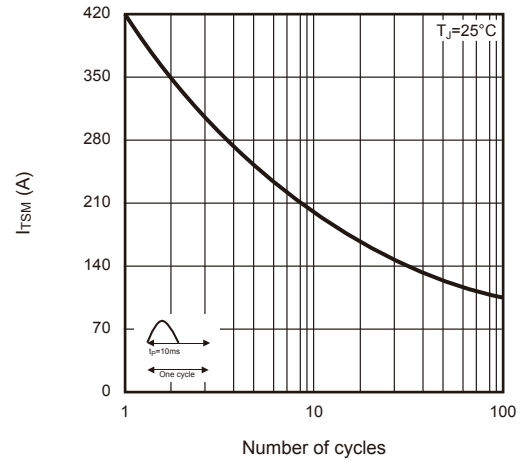


Fig.3 - On-state characteristics (maximum values)

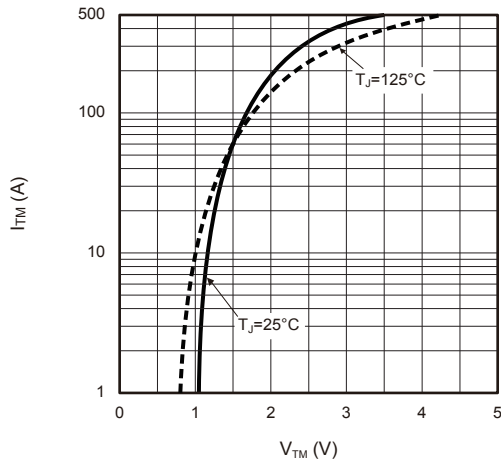


Fig.4 - Maximum power dissipation versus RMS on-state current

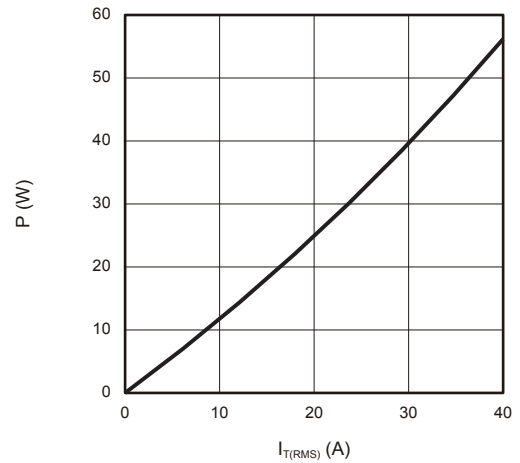
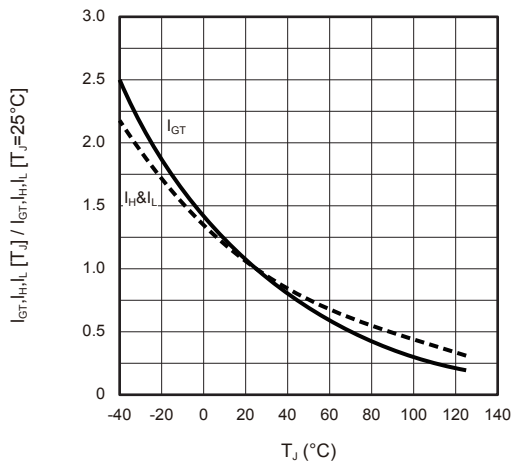
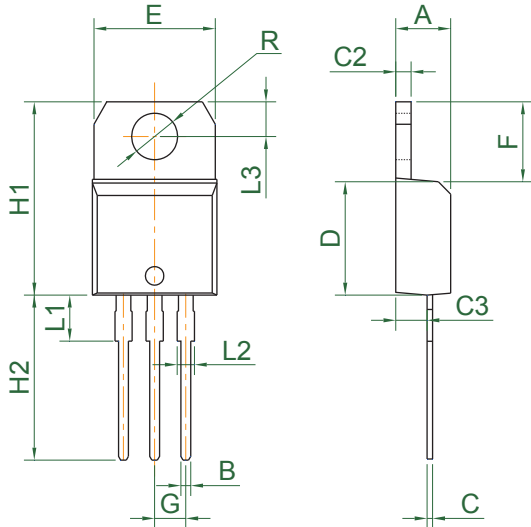


Fig.5 - Relative variations of gate trigger current, holding current and latching current versus junction temperature



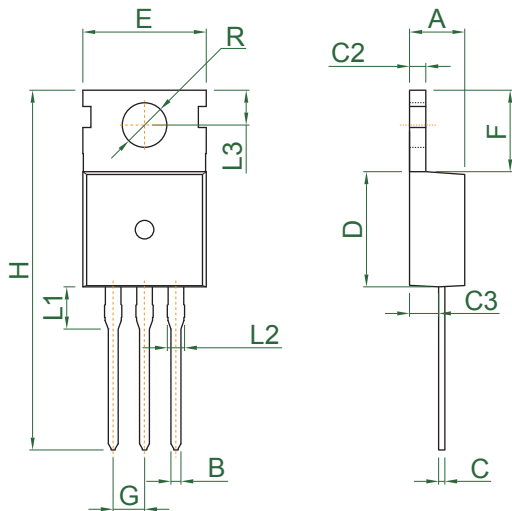
Package Outline Dimensions

TO-220E-3(Ins)



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.38	-	4.61	.172	-	.182
B	0.6	-	0.92	.024	-	.036
C	0.35	-	0.7	.014	-	.028
C2	1.15	-	1.36	.045	-	.054
C3	2.35	-	2.75	.092	-	.108
D	8.6	-	9.7	.339	-	.382
E	9.8	-	10.4	.386	-	.409
F	5.85	-	6.95	.230	-	.274
G	2.4	-	2.7	.094	-	.106
H1	14.8	-	16.1	.583	-	.634
H2	13.0	-	14.0	.512	-	.551
L1	2.8	-	4.2	.110	-	.165
L2	1.14	-	1.7	.045	-	.067
L3	2.65	-	3.1	.104	-	.122
R	3.7	-	3.95	.146	-	.156

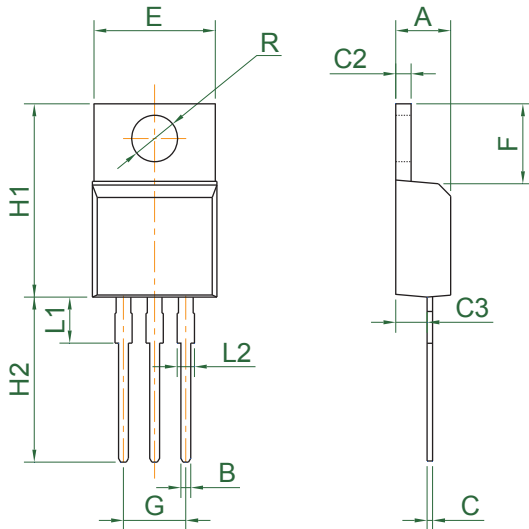
TO-220C-3



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.4	-	4.6	.173	-	.181
B	0.7	-	0.9	.028	-	.035
C	0.45	-	0.6	.018	-	.024
C2	1.23	-	1.48	.048	-	.058
C3	2.2	-	2.6	.087	-	.102
D	8.9	-	9.9	.350	-	.390
E	9.9	-	10.3	.390	-	.406
F	6.3	-	6.9	.248	-	.272
G	2.4	-	2.7	.094	-	.106
H	28.0	-	29.8	1.102	-	1.173
L1	3.1	-	3.7	.122	-	.146
L2	1.14	-	1.7	.045	-	.067
L3	2.65	-	2.95	.104	-	.116
R	3.45	-	3.65	.136	-	.144

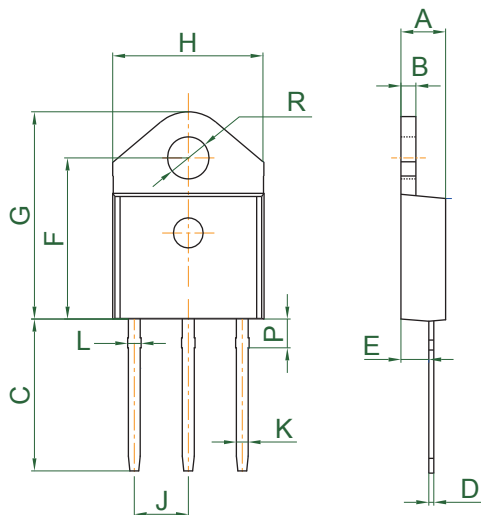
Package Outline Dimensions

TO-220AB



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.07	-	4.85	.160	-	.191
B	0.6	-	1.0	.024	-	.039
C	0.28	-	0.7	.011	-	.028
C2	1.1	-	1.5	.043	-	.059
C3	2.04	-	2.92	.080	-	.115
E	-	-	10.5	-	-	.413
F	5.8	-	6.93	.228	-	.273
G	4.84	-	5.32	.190	-	.209
H1	13.0	-	16.6	.512	-	.654
H2	12.7	-	14.2	.500	-	.559
L1	2.7	-	4.5	.106	-	.177
L2	1.1	-	1.7	.043	-	.067
R	3.4	-	3.95	.134	-	.156

TO-3P(Ins)



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.4	-	4.6	.173	-	.181
B	1.4	-	1.6	.055	-	.063
C	14.35	-	15.88	.565	-	.625
D	0.5	-	0.7	.020	-	.028
E	2.7	-	2.9	.106	-	.114
F	15.8	-	16.5	.622	-	.650
G	20.27	-	21.1	.798	-	.831
H	15.1	-	15.5	.594	-	.610
J	5.35	-	5.65	.211	-	.222
K	1.1	-	1.5	.043	-	.059
L	1.15	-	1.55	.045	-	.061
P	2.68	-	3.08	.105	-	.121
R	4.08	-	4.25	.160	-	.167