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.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!

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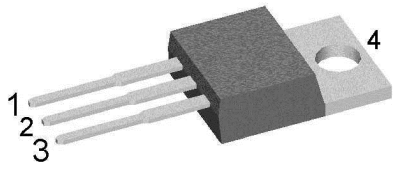
Thyristor

V_{RRM} = 1600 V
I_{TAV} = 30 A
V_T = 1.42 V

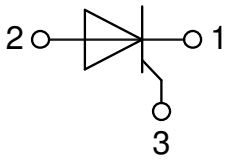
Single Thyristor

Part number

CMA30E1600PB



Backside: anode



Features / Advantages:

- Thyristor for line frequency
- Planar passivated chip
- Long-term stability

Applications:

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

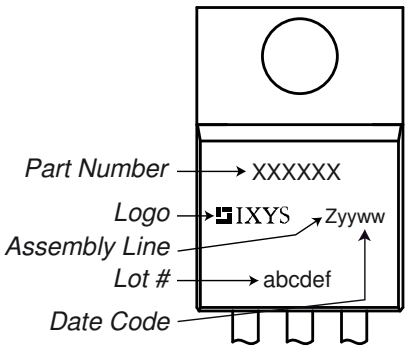
Package: TO-220

- Industry standard outline
- RoHS compliant
- Epoxy meets UL 94V-0

Thyristor				Ratings			
Symbol	**Definition**	**Conditions**		**min.**	**typ.**	**max.**	**Unit**
$V_{RSM/DSM}$	*max. non-repetitive reverse/forward blocking voltage*		T_{VJ} = 25°C			1700	V
$V_{RRM/DRM}$	*max. repetitive reverse/forward blocking voltage*		T_{VJ} = 25°C			1600	V
$I_{R/D}$	*reverse current, drain current*	$V_{R/D}$ = 1600 V	T_{VJ} = 25°C			10	µA
		$V_{R/D}$ = 1600 V	T_{VJ} = 125°C			2	mA
V_T	*forward voltage drop*	I_T = 30 A	T_{VJ} = 25°C			1.42	V
		I_T = 60 A				1.80	V
		I_T = 30 A	T_{VJ} = 125°C			1.42	V
		I_T = 60 A				1.92	V
I_{TAV}	*average forward current*	T_C = 115°C	T_{VJ} = 150°C			30	A
$I_{T(RMS)}$	*RMS forward current*	180° sine				47	A
V_{T0}	*threshold voltage* } *for power loss calculation only*		T_{VJ} = 150°C			0.90	V
r_T	*slope resistance* }					17	mΩ
R_{thJC}	*thermal resistance junction to case*					0.5	K/W
R_{thCH}	*thermal resistance case to heatsink*				0.50		K/W
P_{tot}	*total power dissipation*		T_C = 25°C			250	W
I_{TSM}	*max. forward surge current*	t = 10 ms; (50 Hz), sine	T_{VJ} = 45°C			260	A
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			280	A
		t = 10 ms; (50 Hz), sine	T_{VJ} = 150°C			220	A
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			240	A
I^2t	*value for fusing*	t = 10 ms; (50 Hz), sine	T_{VJ} = 45°C			340	A^2s
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			325	A^2s
		t = 10 ms; (50 Hz), sine	T_{VJ} = 150°C			240	A^2s
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			240	A^2s
C_J	*junction capacitance*	V_R = 400 V f = 1 MHz	T_{VJ} = 25°C		13		pF
P_{GM}	*max. gate power dissipation*	t_P = 30 µs	T_C = 150°C			10	W
		t_P = 300 µs				5	W
P_{GAV}	*average gate power dissipation*					0.5	W
$(di/dt)_{cr}$	*critical rate of rise of current*	T_{VJ} = 125°C; f = 50 Hz	repetitive, I_T = 90 A			150	A/µs
		t_P = 200 µs; di_G/dt = 0.2 A/µs;					
		I_G = 0.2 A; V = ⅔ V_{DRM}	non-repet., I_T = 30 A			500	A/µs
$(dv/dt)_{cr}$	*critical rate of rise of voltage*	V = ⅔ V_{DRM}	T_{VJ} = 125°C			500	V/µs
		R_{GK} = ∞; method 1 (linear voltage rise)					
V_{GT}	*gate trigger voltage*	V_D = 6 V	T_{VJ} = 25°C			1.3	V
			T_{VJ} = -40°C			1.6	V
I_{GT}	*gate trigger current*	V_D = 6 V	T_{VJ} = 25°C			28	mA
			T_{VJ} = -40°C			50	mA
V_{GD}	*gate non-trigger voltage*	V_D = ⅔ V_{DRM}	T_{VJ} = 150°C			0.2	V
I_{GD}	*gate non-trigger current*					1	mA
I_L	*latching current*	t_p = 10 µs	T_{VJ} = 25°C			90	mA
		I_G = 0.2 A; di_G/dt = 0.2 A/µs					
I_H	*holding current*	V_D = 6 V R_{GK} = ∞	T_{VJ} = 25°C			60	mA
t_{gd}	*gate controlled delay time*	V_D = ½ V_{DRM}	T_{VJ} = 25°C			2	µs
		I_G = 0.5 A; di_G/dt = 0.5 A/µs					
t_q	*turn-off time*	V_R = 100 V; I_T = 30 A; V = ⅔ V_{DRM}	T_{VJ} = 125 °C		150		µs
		di/dt = 10 A/µs dv/dt = 20 V/µs t_p = 200 µs					

Package TO-220			Ratings			
Symbol	**Definition**	**Conditions**	**min.**	**typ.**	**max.**	**Unit**
I_{RMS}	*RMS current*	per terminal			35	A
T_{VJ}	*virtual junction temperature*		-40		150	°C
T_{op}	*operation temperature*		-40		125	°C
T_{stg}	*storage temperature*		-40		150	°C
Weight				2		g
M_D	*mounting torque*		0.4		0.6	Nm
F_C	*mounting force with clip*		20		60	N

Product Marking



Part description

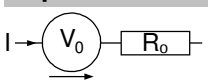
C = Thyristor (SCR)
M = Thyristor
A = (up to 1800V)
30 = Current Rating [A]
E = Single Thyristor
1600 = Reverse Voltage [V]
PB = TO-220AB (3)

Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	CMA30E1600PB	CMA30E1600PB	Tube	50	503348

Similar Part	Package	Voltage class
CMA30E1600PN	TO-220ABFP (3)	1600
CMA30E1600PZ	TO-263AB (D2Pak) (2HV)	1600
CLA30E1200PB	TO-220AB (3)	1200
CS22-12io1M	TO-220ABFP (3)	1200
CLA30E1200PC	TO-263AB (D2Pak) (2)	1200
CLA30E1200HB	TO-247AD (3)	1200
CS22-08io1M	TO-220ABFP (3)	800

Equivalent Circuits for Simulation

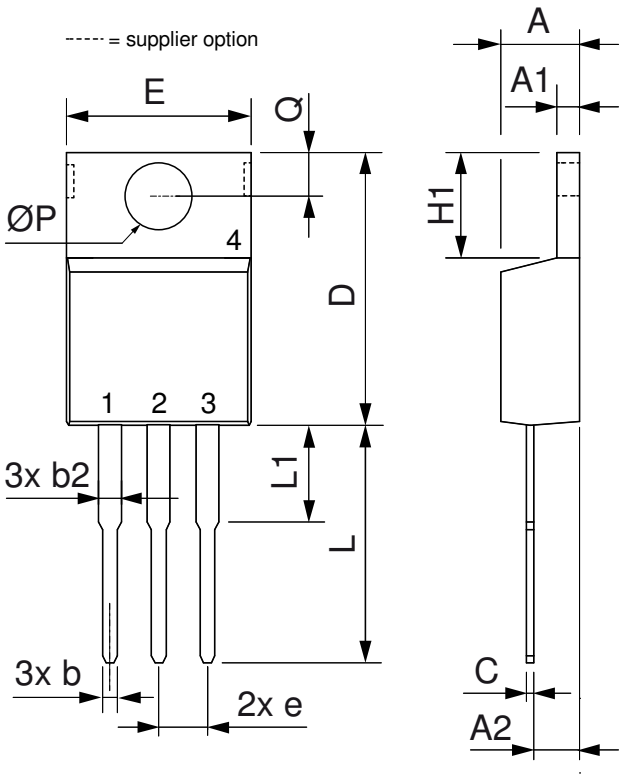
** on die level* T_{VJ} = 150 °C



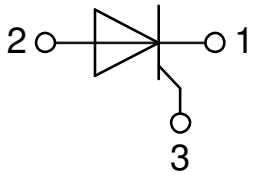
Thyristor

$V_{0\,max}$	*threshold voltage*	0.9	V
$R_{0\,max}$	*slope resistance **	14	mΩ

Outlines TO-220



Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.32	4.82	0.170	0.190
A1	1.14	1.39	0.045	0.055
A2	2.29	2.79	0.090	0.110
b	0.64	1.01	0.025	0.040
b2	1.15	1.65	0.045	0.065
C	0.35	0.56	0.014	0.022
D	14.73	16.00	0.580	0.630
E	9.91	10.66	0.390	0.420
e	2.54	BSC	0.100	BSC
H1	5.85	6.85	0.230	0.270
L	12.70	13.97	0.500	0.550
L1	2.79	5.84	0.110	0.230
ØP	3.54	4.08	0.139	0.161
Q	2.54	3.18	0.100	0.125



Thyristor

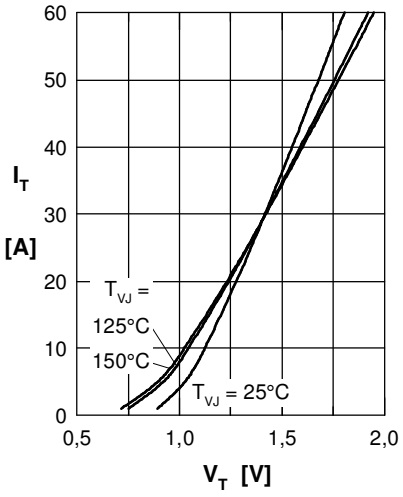


Fig. 1 Forward characteristics

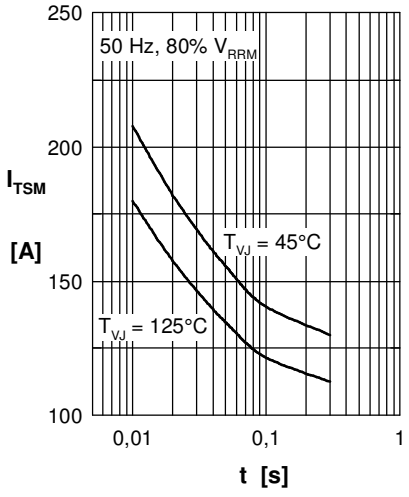


Fig. 2 Surge overload current
I_{TSM}: crest value, t: duration

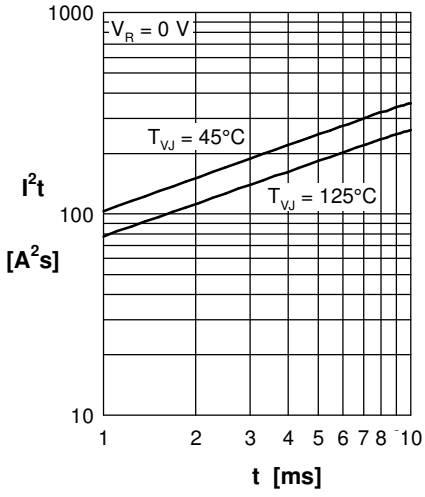


Fig. 3 I^2t versus time (1-10 s)

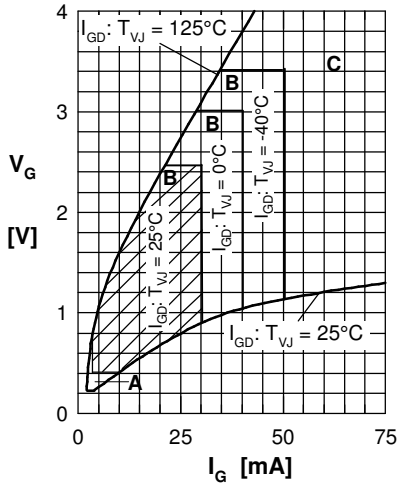


Fig. 4 Gate voltage & gate current
Triggering: A = no; B = possible; C = safe

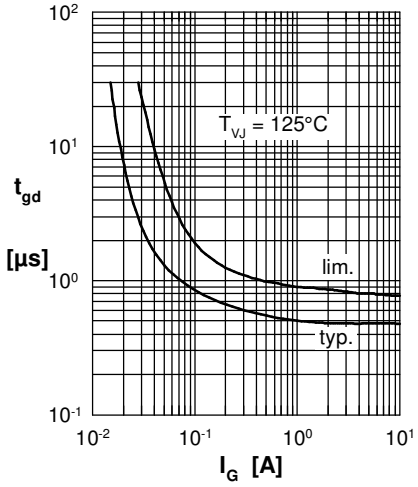


Fig. 5 Gate controlled delay time t_{gd}

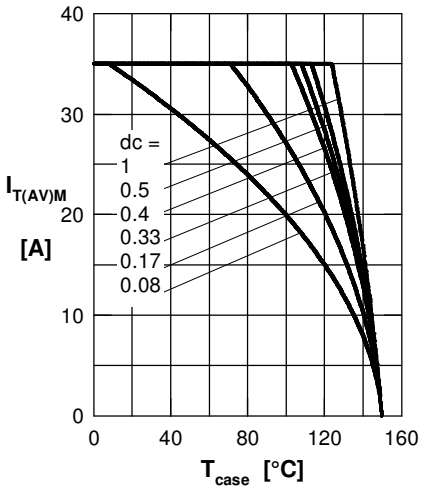
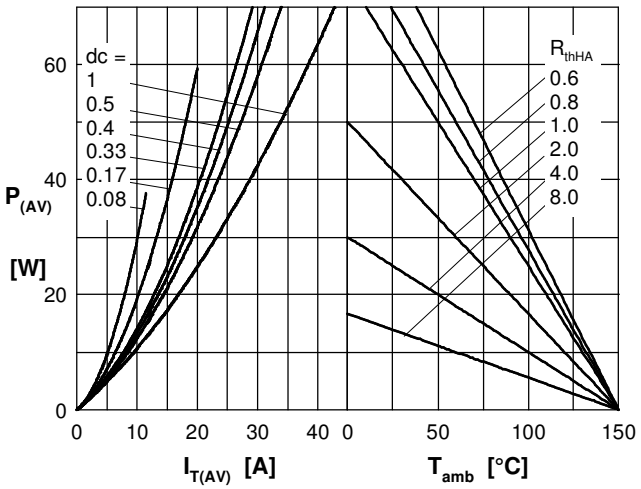
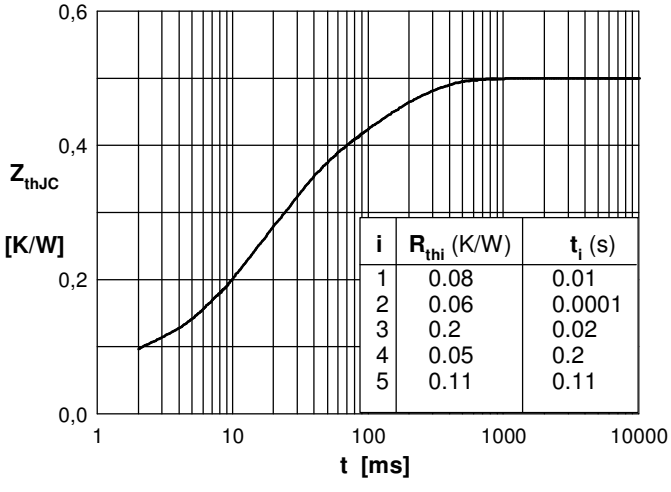


Fig. 6 Max. forward current at case temperature





i	R_{thi} (K/W)	t_i (s)
1	0.08	0.01
2	0.06	0.0001
3	0.2	0.02
4	0.05	0.2
5	0.11	0.11

Fig. 7a Power dissipation versus direct output current
Fig. 7b and ambient temperature

Fig. 7 Transient thermal impedance junction to case