

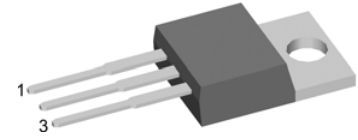
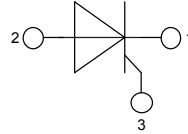
## Standard SCR

Single Thyristor

$$\begin{aligned} V_{RRM} &= 1600 \text{ V} \\ I_{T(RMS)} &= 47 \text{ A} \\ I_{T(AVM)} &= 30 \text{ A} \end{aligned}$$

Part number

CMA 30 E 1600 PB



Backside: anode

## Features / Advantages:

- Thyristor for line frequency
- Planar passivated chip
- Long-term stability of blocking currents and voltages

## Applications:

- Motor control
- Power converter
- AC power controller
- Switch mode and resonant mode power supplies
- Light and temperature control

## Package:

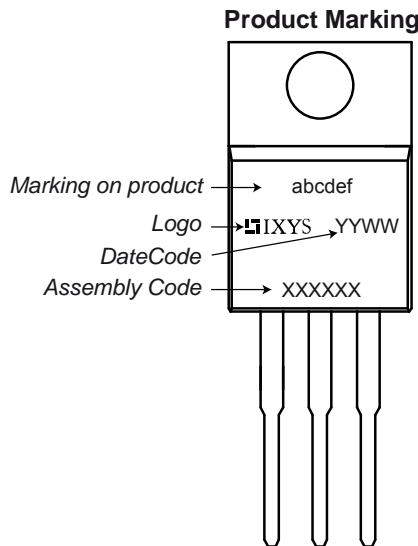
- Housing: TO-220
- Industry standard outline
- Epoxy meets UL 94V-0
- RoHS compliant

Symbol	Definition	Conditions	Ratings			Unit
			min.	typ.	max.	
$V_{RSMDSM}$	max. non-repetitive reverse/forward blocking voltage				1700	V
$V_{RRM/DRM}$	max. repetitive reverse/forward blocking voltage				1600	V
$I_{R/D}$	reverse current, drain current	$V_R = 1600 \text{ V}$			10	$\mu\text{A}$
		$V_R = 1600 \text{ V}$			2	mA
$V_T$	forward voltage	$I_F = 30 \text{ A}$			1.45	V
		$I_F = 60 \text{ A}$			1.70	V
		$I_F = 30 \text{ A}$			1.40	V
		$I_F = 60 \text{ A}$			1.65	V
$I_{T(AVM)}$	max. average forward current	$T_C = 115^\circ\text{C}$			30	A
$I_{T(RMS)}$	RMS forward current	180° sine			47	A
$V_{TO}$	threshold voltage	} for power loss calculation only			0.92	V
$r_T$	slope resistance				18	m $\Omega$
$R_{thJC}$	thermal resistance junction to case				0.75	K/W
$T_{VJ}$	virtual junction temperature		-40		150	$^\circ\text{C}$
$P_{tot}$	total power dissipation				165	W
$P_{GM}$	max. gate power dissipation	$t_p = 30 \mu\text{s}$			10	W
		$t_p = 300 \mu\text{s}$			5	W
$P_{GAV}$	average gate power dissipation				0.5	W
$I_{FSM}$	max. forward surge current	$t = 10 \text{ ms}; (50 \text{ Hz}), \text{ sine}$	$T_{VJ} = 45^\circ\text{C}$		260	A
		$t = 8,3 \text{ ms}; (60 \text{ Hz}), \text{ sine}$	$V_R = 0 \text{ V}$		280	A
		$t = 10 \text{ ms}; (50 \text{ Hz}), \text{ sine}$	$T_{VJ} = 150^\circ\text{C}$		220	A
		$t = 8,3 \text{ ms}; (60 \text{ Hz}), \text{ sine}$	$V_R = 0 \text{ V}$		240	A
$I^2t$	value for fusing	$t = 10 \text{ ms}; (50 \text{ Hz}), \text{ sine}$	$T_{VJ} = 45^\circ\text{C}$		340	A <sup>2</sup> s
		$t = 8,3 \text{ ms}; (60 \text{ Hz}), \text{ sine}$	$V_R = 0 \text{ V}$		325	A <sup>2</sup> s
		$t = 10 \text{ ms}; (50 \text{ Hz}), \text{ sine}$	$T_{VJ} = 150^\circ\text{C}$		240	A <sup>2</sup> s
		$t = 8,3 \text{ ms}; (60 \text{ Hz}), \text{ sine}$	$V_R = 0 \text{ V}$		240	A <sup>2</sup> s
$C_J$	junction capacitance	$V_R = 400 \text{ V}$ $f = 1 \text{ MHz}$	$T_{VJ} = 25^\circ\text{C}$		13	pF

Symbol	Definition	Conditions	Ratings			Unit
			min.	typ.	max.	
$(di/dt)_cr$	critical rate of rise of current	$T_{VJ} = 125^{\circ}\text{C}$ repetitive, $I_T = 40\text{ A}$ $f = 50\text{ Hz}$ ; $t_p = 200\ \mu\text{s}$			150	$\text{A}/\mu\text{s}$
		$I_G = 0.2\text{ A}$ ; $di_G/dt = 0.2\text{ A}/\mu\text{s}$ $V_D = \frac{2}{3} V_{DRM}$ non-repetitive, $I_T = 22\text{ A}$			500	$\text{A}/\mu\text{s}$
$(dv/dt)_cr$	critical rate of rise of voltage	$V_D = \frac{2}{3} V_{DRM}$ $T_{VJ} = 125^{\circ}\text{C}$ $R_{GK} = \infty$ ; method 1 (linear voltage rise)			500	$\text{V}/\mu\text{s}$
$V_{GT}$	gate trigger voltage	$V_D = 6\text{ V}$ $T_{VJ} = 25^{\circ}\text{C}$ $T_{VJ} = -40^{\circ}\text{C}$			1.3	V
$I_{GT}$	gate trigger current	$V_D = 6\text{ V}$ $T_{VJ} = 25^{\circ}\text{C}$ $T_{VJ} = -40^{\circ}\text{C}$			1.6	V
					28	mA
					50	mA
$V_{GD}$	gate non-trigger voltage	$V_D = \frac{2}{3} V_{DRM}$ $T_{VJ} = 150^{\circ}\text{C}$			0.2	V
$I_{GD}$	gate non-trigger current				1	mA
$I_L$	latching current	$t_p = 10\ \mu\text{s}$ $T_{VJ} = 25^{\circ}\text{C}$ $I_G = 0.2\text{ A}$ ; $di_G/dt = 0.2\text{ A}/\mu\text{s}$			90	mA
$I_H$	holding current	$V_D = 6\text{ V}$ $R_{GK} = \infty$ $T_{VJ} = 25^{\circ}\text{C}$			60	mA
$t_{gd}$	gate controlled delay time	$V_R = \frac{1}{2} V_{DRM}$ $T_{VJ} = 25^{\circ}\text{C}$ $I_G = 0.5\text{ A}$ ; $di_G/dt = 0.5\text{ A}/\mu\text{s}$			2	$\mu\text{s}$
$t_q$	turn-off time	$V_R = 100\text{ V}$ ; $I_T = 22\text{ A}$ $T_{VJ} = 25^{\circ}\text{C}$ $V_D = \frac{2}{3} V_{DRM}$ ; $t_p = 200\ \mu\text{s}$ $di/dt = 10\text{ A}/\mu\text{s}$ ; $dv/dt = 20\text{ V}/\mu\text{s}$		150		$\mu\text{s}$

Symbol	Definition	Conditions	Ratings			Unit
			min.	typ.	max.	
$I_{RMS}$	RMS current	per pin <sup>1)</sup>			50	A
$R_{thCH}$	thermal resistance case to heatsink			0.50		K/W
$T_{stg}$	storage temperature		-55		150	°C
<b>Weight</b>				2		g
$M_D$	mounting torque		0.4		0.6	Nm
$F_c$	mounting force with clip		20		60	N

<sup>1)</sup>  $I_{RMS}$  is typically limited by: 1. pin-to-chip resistance; or by 2. current capability of the chip.  
 In case of 1, a common cathode/anode configuration and a non-isolated backside, the whole current capability can be used by connecting the backside.

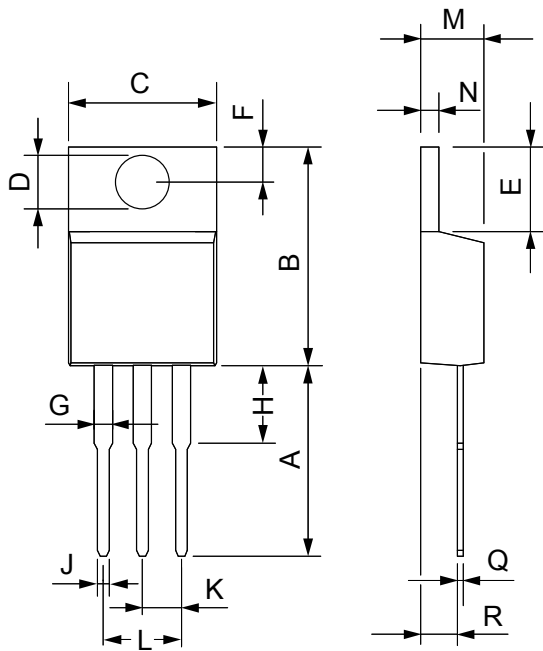

**Part number**

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

Ordering	Part Name	Marking on Product	Delivering Mode	Base Qty	Code Key
Standard	CMA 30 E 1600 PB	CMA30E1600PB	Tube	50	503348

Similar Part	Package	Voltage class
CMA30E1600PN	TO-220ABFP (3)	1600
CLA30E1200PB	TO-220AB (3)	1200
CS22-12io1M	TO-220ABFP (3)	1200
CS29-12io1C	ISOPLUS220AB (3)	1200
CLA30E1200PC	TO-263AB (D2Pak)	1200
CLA30E1200HB	TO-247AD (3)	1200
CS22-08io1M	TO-220ABFP (3)	800
CS29-08io1C	ISOPLUS220AB (3)	800

Outlines TO-220



Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	12.70	13.97	0.500	0.550
B	14.73	16.00	0.580	0.630
C	9.91	10.66	0.390	0.420
D	3.54	4.08	0.139	0.161
E	5.85	6.85	0.230	0.270
F	2.54	3.18	0.100	0.125
G	1.15	1.65	0.045	0.065
H	2.79	5.84	0.110	0.230
J	0.64	1.01	0.025	0.040
K	2.54	BSC	0.100	BSC
M	4.32	4.82	0.170	0.190
N	1.14	1.39	0.045	0.055
Q	0.35	0.56	0.014	0.022
R	2.29	2.79	0.090	0.110