advanced

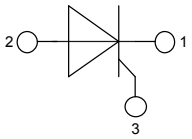
Standard SCR

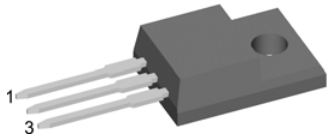
Single Thyristor

V_{RRM} = 1600 V
$I_{T(RMS)}$ = 47 A
$I_{T(AV)M}$ = 30 A

Part number

CMA 30 E 1600 PN





Backside: Isolated

E72873

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-220FP
- Industry standard outline
- Plastic overmolded tab for electrical isolation
- Isolation Voltage 2500 V
- UL registered E 72873
- Epoxy meets UL 94V-0
- RoHS compliant

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 = 1600 V	T_{VJ} = 25°C			10	µA
		V_R = 1600 V	T_{VJ} = 125°C			2	mA
V_T	*forward voltage*	I_F = 30 A	T_{VJ} = 25°C			1.45	V
		I_F = 60 A				1.70	V
		I_F = 30 A	T_{VJ} = 125°C			1.40	V
		I_F = 60 A				1.65	V
$I_{T(AV)M}$	*max. average forward current*	T_C = 40°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			0.92	V
r_T	*slope resistance* }					18	mΩ
R_{thJC}	*thermal resistance junction to case*					2.50	K/W
T_{VJ}	*virtual junction temperature*			-40		150	°C
P_{tot}	*total power dissipation*		T_C = 25°C			50	W
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
I_{FSM}	*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	A²s
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			325	A²s
		t = 10 ms; (50 Hz), sine	T_{VJ} = 150°C			240	A²s
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			240	A²s
C_J	*junction capacitance*	V_R = 400 V f = 1 MHz	T_{VJ} = 25°C		9		pF

Symbol	Definition	Conditions	Ratings min.	typ.	max.	Unit
$(di/dt)_{cr}$	*critical rate of rise of current*	T_{VJ} = 125°C repetitive, I_T = 40 A			150	A/µs
		f = 50 Hz; t_P = 200 µs				
		I_G = 0.2 A; di_G/dt = 0.2 A/µs				
		V_D = ⅔ V_{DRM} non-repetitive, I_T = 22 A			500	A/µs
$(dv/dt)_{cr}$	*critical rate of rise of voltage*	V_D = 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} = 125 °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			80	mA
t_{gd}	*gate controlled delay time*	V_R = 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 = 22 A T_{VJ} = 25 °C		150		µs
		V_D = ⅔ V_{DRM}; t_p = 200 µs				
		di/dt = 10 A/µs; dv/dt = 20 V/µs				

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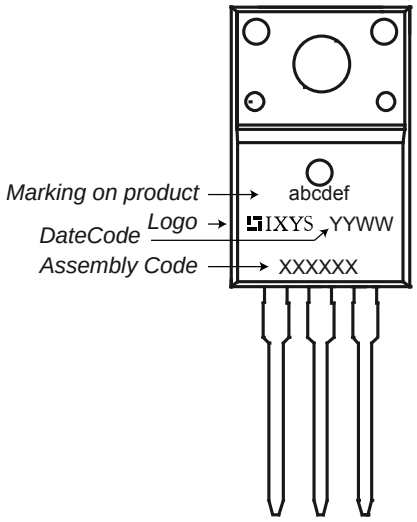
Symbol	Definition	Conditions	Ratings min.	typ.	max.	Unit
I_{RMS}	*RMS current*	per pin [1]			35	A
R_{thCH}	*thermal resistance case to heatsink*			0.50		K/W
T_{stg}	*storage temperature*		-55		150	°C
Weight				2		g
M_D	*mounting torque*		0.4		0.6	Nm
F_C	*mounting force with clip*		20		60	N
V_{ISOL}	*isolation voltage*	t = 1 second	2500			V
		t = 1 minute	2000			V
d_S	*creapage distance on surface*		1.07			mm
d_A	*striking distance through air*		1.07			mm

[1] 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.

Product Marking



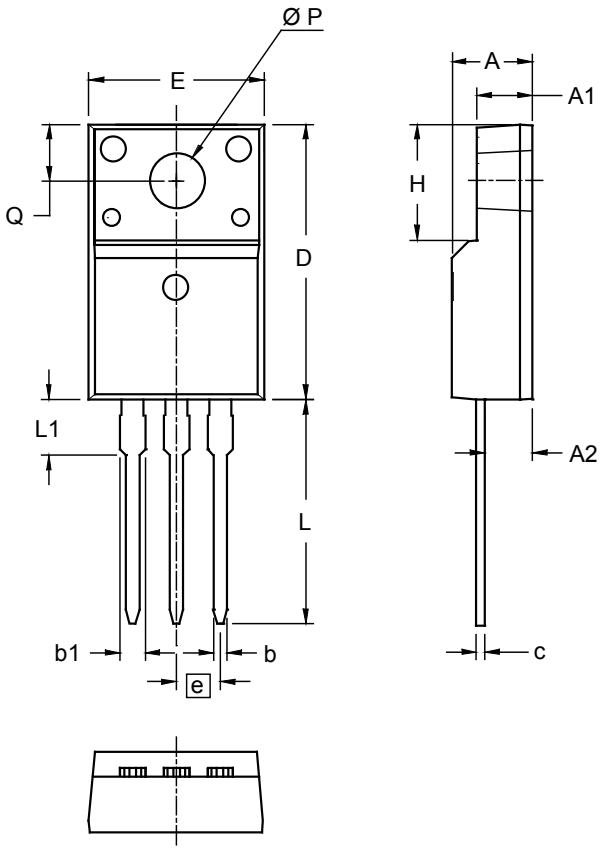
Part number

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

Ordering	Part Name	Marking on Product	Delivering Mode	Base Qty	Code Key
Standard	CMA 30 E 1600 PN	CMA30E1600PN	Tube	50	505254

Similar Part	Package	Voltage class
CMA30E1600PB	TO-220AB (3)	1600
CS22-12io1M	TO-220ABFP (3)	1200
CLA30E1200PB	TO-220AB (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-220FP



SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.177	.193	4.50	4.90
A1	.092	.108	2.34	2.74
A2	.101	.117	2.56	2.96
b	.028	.035	0.70	0.90
b1	.050	.058	1.27	1.47
c	.018	.024	0.45	0.60
D	.617	.633	15.67	16.07
E	.392	.408	9.96	10.36
e	.100 BSC		2.54 BSC	
H	.255	.271	6.48	6.88
L	.499	.523	12.68	13.28
L1	.119	.135	3.03	3.43
ØP	.121	.129	3.08	3.28
Q	.126	.134	3.20	3.40