Thyristor

CMA30E1600PN

| V_{RRM} | = | 1600 V |
|------------------|---|--------|
| I _{tav} | = | 23 A |
| VT | = | 1.42 V |

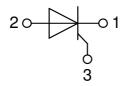
Single Thyristor

Part number

CMA30E1600PN



Backside: Isolated **E**72873



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-220FP

- Isolation Voltage: 2500 V~
- Industry standard outline
- RoHS compliant
- Epoxy meets UL 94V-0
- Soldering pins for PCB mounting
- Base plate: Plastic overmolded tab
- Reduced weight

Terms Conditions of usage:

The data contained in this product data sheet is exclusively intended for technically trained staff. The user will have to evaluate the suitability of the product for the intended application and the completeness of the product data with respect to his application. The specifications of our components may not be considered as an assurance of component characteristics. The information in the valid application- and assembly notes must be considered. Should you require product information in excess of the data given in this product data sheet or which concerns the specific application of your product, please contact the sales office, which is responsible for you. Due to technical requirements our product may contain dangerous substances. For information on the types in question please contact the sales office, which is responsible for you. Should you intend to use the product in aviation, in health or live endangering or life support applications, please notify. For any such application we urgently recommend

to perform joint risk and quality assessments;
the conclusion of quality agreements;

- to establish joint measures of an ongoing product survey, and that we may make delivery dependent on the realization of any such measures.

IXYS reserves the right to change limits, conditions and dimensions.

Data according to IEC 60747and per semiconductor unless otherwise specified

© 2015 IXYS all rights reserved

LIXYS

CMA30E1600PN

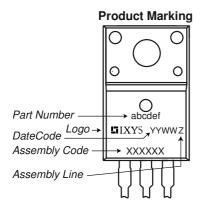
| Thyristo | | | | | Ratings | | ! |
|--------------------------|------------------------------------|---|--|------|---------|----------|------------------|
| Symbol | Definition | Conditions | | min. | typ. | max. | Unit |
| V _{RSM/DSM} | max. non-repetitive reverse/forwa | rd blocking voltage | $T_{VJ} = 25^{\circ}C$ | | | 1700 | V |
| V _{RRM/DRM} | max. repetitive reverse/forward bi | locking voltage | $T_{VJ} = 25^{\circ}C$ | | | 1600 | V |
| R/D | reverse current, drain current | $V_{R/D} = 1600 V$ | $T_{VJ} = 25^{\circ}C$ | | | 10 | μA |
| | | V _{R/D} = 1600 V | $T_{vJ} = 125^{\circ}C$ | | | 2 | mA |
| VT | forward voltage drop | I _T = 30 A | $T_{VJ} = 25^{\circ}C$ | | | 1.42 | V |
| | | $I_{T} = 60 A$ | | | | 1.80 | V |
| | | $I_{T} = 30 \text{ A}$ | $T_{vJ} = 125^{\circ}C$ | | | 1.42 | V |
| | | $I_{T} = 60 A$ | | | | 1.92 | V |
| ITAV | average forward current | $T_c = 40^{\circ}C$ | $T_{vJ} = 150^{\circ}C$ | | | 23 | A |
| I _{T(RMS)} | RMS forward current | 180° sine | | | | 36 | A |
| V _{T0} | threshold voltage | | $T_{vJ} = 150^{\circ}C$ | | | 0.90 | V |
| r _T | slope resistance } for power lo | oss calculation only | | | | 17 | mΩ |
| R _{thJC} | thermal resistance junction to cas | e | | | | 2.5 | K/W |
| R _{thCH} | thermal resistance case to heatsi | nk | | | 0.50 | | K/W |
| P _{tot} | total power dissipation | | $T_c = 25^{\circ}C$ | | | 50 | W |
| I _{TSM} | max. forward surge current | t = 10 ms; (50 Hz), sine | $T_{VJ} = 45^{\circ}C$ | | | 260 | A |
| | | t = 8,3 ms; (60 Hz), sine | $V_{R} = 0 V$ | | | 280 | A |
| | | t = 10 ms; (50 Hz), sine | T _{v.l} = 150°C | | | 220 | A |
| | | t = 8,3 ms; (60 Hz), sine | $V_{R} = 0 V$ | | | 240 | A |
| l²t | value for fusing | t = 10 ms; (50 Hz), sine | $T_{VJ} = 45^{\circ}C$ | | | 340 | A²s |
| | | t = 8,3 ms; (60 Hz), sine | $V_{\rm B} = 0 V$ | | | 325 | A²s |
| | | t = 10 ms; (50 Hz), sine | T _{vJ} = 150°C | | | 240 | A ² s |
| | | t = 8,3 ms; (60 Hz), sine | $V_{R} = 0 V$ | | | 240 | A²s |
| C | junction capacitance | $V_{\rm B} = 400 \text{V}$ f = 1 MHz | $T_{VJ} = 25^{\circ}C$ | | 9 | | pF |
| P _{GM} | max. gate power dissipation | t _P = 30 μs | $T_{c} = 150^{\circ}C$ | | | 10 | W |
| GW | | t _P = 300 μs | Ū. | | | 5 | w |
| P _{GAV} | average gate power dissipation | -F F | | | | 0.5 | w |
| (di/dt) _{cr} | critical rate of rise of current | T _{v.i} = 125 °C; f = 50 Hz re | petitive. I _t = 90 A | | | | A/µs |
| (| | $t_{\rm P} = 200 \mu {\rm s}; di_{\rm G}/dt = 0.2 {\rm A}/\mu {\rm s}; -$ | • | | | | |
| | | | on-repet., $I_{\tau} = 30 \text{ A}$ | | | 500 | A/µs |
| (dv/dt) _{cr} | critical rate of rise of voltage | $V = \frac{2}{3} V_{\text{DRM}}$ | $T_{v_i} = 125^{\circ}C$ | | | | V/µs |
| (all all all all a | g- | $R_{GK} = \infty$; method 1 (linear volta) | | | | | 1,40 |
| V _{gT} | gate trigger voltage | $V_{\rm D} = 6 \text{ V}$ | $\frac{\text{genee}}{\text{T}_{\text{vJ}} = 25^{\circ}\text{C}}$ | | | 1.3 | v |
| ▪ GT | gale ligger reliage | • _B = o | $T_{VJ} = -40^{\circ}C$ | | | 1.6 | v |
| | gate trigger current | $V_{D} = 6 V$ | $T_{VJ} = 25^{\circ}C$ | | | 28 | mA |
| I _{GT} | gate ingger current | $\mathbf{v}_{\mathrm{D}} = \mathbf{O} \cdot \mathbf{v}$ | $T_{VJ} = -40^{\circ}C$ | | | 20 50 | mA |
| V | gate non-trigger voltage | $V_{\rm D} = \frac{2}{3} V_{\rm DBM}$ | $T_{VJ} = -40 \text{ C}$ $T_{VJ} = 125^{\circ}\text{C}$ | | | 0.2 | V |
| V _{gd} | | $\mathbf{v}_{\mathrm{D}} = 73 \mathbf{v}_{\mathrm{DRM}}$ | $\Gamma_{VJ} = 125 \text{ G}$ | | | | |
| | gate non-trigger current | + 10 us | Τ | | | 1 | mA |
| I. | latching current | $t_p = 10 \ \mu s$ | $T_{vJ} = 25 ^{\circ}C$ | | | 90 | mA |
| | holding our | $I_{\rm G} = 0.2 \text{A}; \text{di}_{\rm G}/\text{dt} = 0.2 \text{A}/\mu\text{s}$ | | | | | |
| I _н | holding current | $V_{\rm D} = 6 V R_{\rm GK} = \infty$ | $T_{VJ} = 25 \circ C$ | | | 80 | mA |
| t _{gd} | gate controlled delay time | $V_D = \frac{1}{2} V_{DRM}$ | $T_{vJ} = 25 \degree C$ | | | 2 | μs |
| | | $I_{\rm G} = 0.5 \rm{A}; di_{\rm G}/dt = 0.5 \rm{A}/\mu\rm{s}$ | | | | | |
| t _q | turn-off time | $V_{R} = 100 \text{ V}; I_{T} = 30 \text{ A}; \text{ V} = \frac{2}{2}$ | | | 150 | | μs |
| | | $di/dt = 10 \text{ A}/\mu \text{s} dv/dt = 20 \text{ V}/\mu \text{s}$ | /μs t _p = 200 μs | | | | 1 |

 $\ensuremath{\mathsf{IXYS}}$ reserves the right to change limits, conditions and dimensions.

XYS

CMA30E1600PN

| Package TO-220FP | | | | Ratings | | | | |
|-----------------------------|------------------------------|---------------------------------|-----------------------------|---------|------|------|------|------|
| Symbol | Definition | Conditions | | | min. | typ. | max. | Unit |
| | RMS current | per terminal | | | | | 35 | Α |
| 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 | Ν |
| d _{Spp/App} | creepage distance on surface | l striking distance through air | terminal to terminal | 1.6 | 1.0 | | | mm |
| d _{Spb/Apb} | creepage distance on surrace | Sunning distance through an | terminal to backside | 2.5 | 2.5 | | | mm |
| V | isolation voltage | t = 1 second | 50/60 Hz, RMS; IIso∟ ≤ 1 mA | | 2500 | | | V |
| | | t = 1 minute | | | 2100 | | | V |



Part description

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

| Ordering | Ordering Number | Marking on Product | Delivery Mode | Quantity | Code No. |
|----------|-----------------|--------------------|---------------|----------|----------|
| Standard | CMA30E1600PN | CMA30E1600PN | Tube | 50 | 505254 |

| Similar Part | Package | Voltage class |
|--------------|------------------------|---------------|
| CMA30E1600PB | TO-220AB (3) | 1600 |
| CMA30E1600PZ | TO-263AB (D2Pak) (2HV) | 1600 |
| CS22-12io1M | TO-220ABFP (3) | 1200 |
| CLA30E1200PB | TO-220AB (3) | 1200 |
| CLA30E1200PC | TO-263AB (D2Pak) (2) | 1200 |
| CLA30E1200HB | TO-247AD (3) | 1200 |
| CS22-08io1M | TO-220ABFP (3) | 800 |

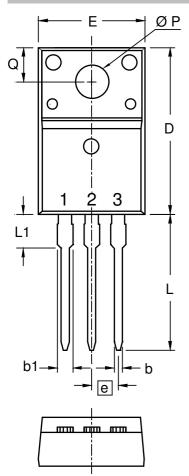
| Equiva | alent Circuits for | Simulation | * on die level | $T_{vJ} = 150 \ ^{\circ}C$ |
|-----------------------|--------------------|------------|----------------|----------------------------|
| |)[R | Thyristor | | |
| V _{0 max} | threshold voltage | 0.9 | | V |
| $\mathbf{R}_{0 \max}$ | slope resistance * | 14 | | mΩ |

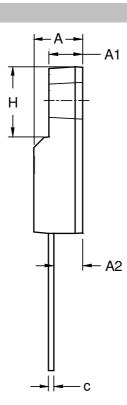
IXYS reserves the right to change limits, conditions and dimensions.

LIXYS

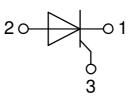
CMA30E1600PN

Outlines TO-220FP





| Dim. | Millimeters | | Inches | | |
|------|-------------|-------|--------|-------|--|
| | min | max | min | max | |
| Α | 4.50 | 4.90 | 0.177 | 0.193 | |
| A1 | 2.34 | 2.74 | 0.092 | 0.108 | |
| A2 | 2.56 | 2.96 | 0.101 | 0.117 | |
| b | 0.70 | 0.90 | 0.028 | 0.035 | |
| С | 0.45 | 0.60 | 0.018 | 0.024 | |
| D | 15.67 | 16.07 | 0.617 | 0.633 | |
| Е | 9.96 | 10.36 | 0.392 | 0.408 | |
| е | 2.54 | BSC | 0.100 | BSC | |
| Н | 6.48 | 6.88 | 0.255 | 0.271 | |
| L | 12.68 | 13.28 | 0.499 | 0.523 | |
| L1 | 3.03 | 3.43 | 0.119 | 0.135 | |
| ØΡ | 3.08 | 3.28 | 0.121 | 0.129 | |
| Q | 3.20 | 3.40 | 0.126 | 0.134 | |



IXYS reserves the right to change limits, conditions and dimensions.

LIXYS

CMA30E1600PN

Т

125°C

4 5 6 7 8 10

1000

100

10

40

1

l²t

[A²s]

 $V_{R} = 0 V$

 $T_{VJ} = 45^{\circ}C$

2

3

Fig. 3 I²t versus time (1-10 s)

t [ms]

Thyristor

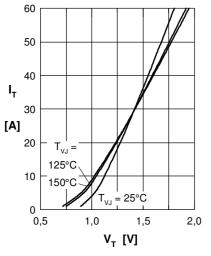


Fig. 1 Forward characteristics

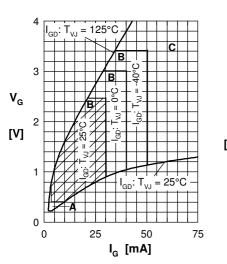


Fig. 4 Gate voltage & gate current Triggering: A = no; B = possible; C = safe

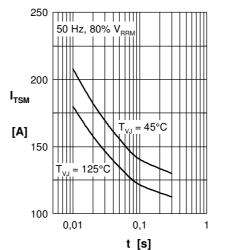
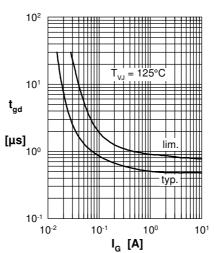


Fig. 2 Surge overload current I_{TSM}: crest value, t: duration



 $\mathsf{R}_{\mathsf{thHA}}$

0.6

70.8

/ 1.0

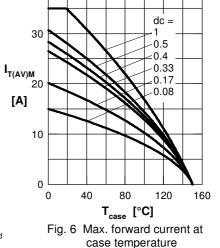
2.0

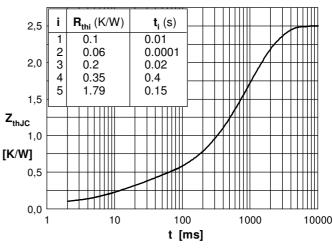
.8.0

100

150

Fig. 5 Gate controlled delay time t_{ad}







20150827d

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

50

T_{amb} [°C]

30 0



20

 $I_{T(AV)}$ [A]

Data according to IEC 60747and per semiconductor unless otherwise specified

10

dc =

0.4

0.33

-0.17

0.08

40 1 0.5

30

20 [W]

10

0

0

P_(AV)

X-ON Electronics

Largest Supplier of Electrical and Electronic Components

Click to view similar products for SCRs category:

Click to view products by IXYS manufacturer:

Other Similar products are found below :

NTE5428 NTE5448 NTE5457 NTE5511 T1500N16TOF VT T720N18TOF T880N14TOF T880N16TOF TS110-7UF TT104N12KOF-A TT104N12KOF-K TT162N16KOF-A TT162N16KOF-K TT330N16AOF VS-16RIA100 VS-22RIA20 VS-2N5206 VS-2N685 VS-40TPS08A-M3 VS-ST230S12P1VPBF 057219R CLB30I1200HB T1190N16TOF VT T1220N22TOF VT T201N70TOH T830N18TOF TD92N16KOF-A TT250N12KOF-K VS-2N692 VS-2N689 VS-25RIA40 VS-16RIA120 VS-10RIA120 VS-30TPS08PBF NTE5427 NTE5442 VS-2N690 VS-ST300S20P0PBF TT251N16KOF-K VS-22RIA100 VS-16RIA40 CR02AM-8#F00 VS-ST110S12P0VPBF TD250N16KOF-A VS-ST110S16P0 VS-10RIA10 VS-16TTS08-M3 TS110-7A1-AP T930N36TOF VT T2160N24TOF VT