

# Thyristor

Phase leg

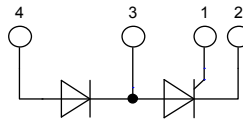
$$V_{RRM} = 1600 \text{ V}$$

$$I_{T(AV)M} = 80 \text{ A}$$

$$I_{T(RMS)} = 126 \text{ A}$$

Part number

**CMA 80 PD 1600 NA**



Backside: isolated

### Features / Advantages:

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

### Applications:

- Softstart AC motor control
- DC Motor control
- Power converter
- AC power control
- Lighting and temperature control

### Package:

- Housing: SOT-227B (minibloc)
- Industry standard outline
- Cu base plate internal DCB isolated
- Isolation Voltage 3000 V
- Epoxy meets UL 94V-0
- RoHS compliant

E72873

### Ratings

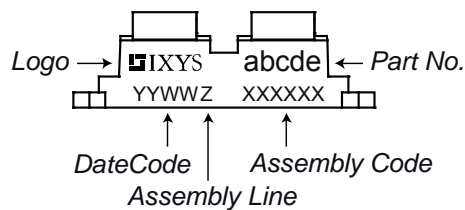
Symbol	Definition	Conditions	min.	typ.	max.	Unit	
$V_{RSM/DSM}$	max. non-repetitive reverse/forward blocking voltage	$T_{VJ} = 25^{\circ}\text{C}$			1700	V	
$V_{RRM/DRM}$	max. repetitive reverse/forward blocking voltage	$T_{VJ} = 25^{\circ}\text{C}$			1600	V	
$I_{RD}$	reverse current, drain current	$V_{RD} = 1600 \text{ V}$			100	$\mu\text{A}$	
		$V_{RD} = 1600 \text{ V}$			10	mA	
$V_T$	forward voltage drop	$I_T = 80 \text{ A}$			1.30	V	
		$I_T = 160 \text{ A}$			1.64	V	
		$I_T = 80 \text{ A}$	$T_{VJ} = 125^{\circ}\text{C}$			1.29	V
		$I_T = 160 \text{ A}$	$T_{VJ} = 125^{\circ}\text{C}$			1.72	V
$I_{T(AV)M}$	average forward current	$T_C = 80^{\circ}\text{C}$			80	A	
$I_{T(RMS)}$	RMS forward current	180° sine			126	A	
$V_{T0}$	threshold voltage	$T_{VJ} = 150^{\circ}\text{C}$			0.86	V	
$r_T$	slope resistance				5.5	m $\Omega$	
$R_{thJC}$	thermal resistance junction to case				0.45	K/W	
$T_{VJ}$	virtual junction temperature		-40		150	$^{\circ}\text{C}$	
$P_{tot}$	total power dissipation	$T_C = 25^{\circ}\text{C}$			270	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	
$I_{TSM}$	max. forward surge current	$t = 10 \text{ ms}; (50 \text{ Hz}), \text{ sine}$	$T_{VJ} = 45^{\circ}\text{C}$			1.07	kA
		$t = 8,3 \text{ ms}; (60 \text{ Hz}), \text{ sine}$	$V_R = 0 \text{ V}$			1.16	kA
		$t = 10 \text{ ms}; (50 \text{ Hz}), \text{ sine}$	$T_{VJ} = 150^{\circ}\text{C}$			910	A
		$t = 8,3 \text{ ms}; (60 \text{ Hz}), \text{ sine}$	$V_R = 0 \text{ V}$			980	A
$I^2t$	value for fusing	$t = 10 \text{ ms}; (50 \text{ Hz}), \text{ sine}$	$T_{VJ} = 45^{\circ}\text{C}$			5.73	kA <sup>2</sup> s
		$t = 8,3 \text{ ms}; (60 \text{ Hz}), \text{ sine}$	$V_R = 0 \text{ V}$			5.55	kA <sup>2</sup> s
		$t = 10 \text{ ms}; (50 \text{ Hz}), \text{ sine}$	$T_{VJ} = 150^{\circ}\text{C}$			4.14	kA <sup>2</sup> s
		$t = 8,3 \text{ ms}; (60 \text{ Hz}), \text{ sine}$	$V_R = 0 \text{ V}$			4.00	kA <sup>2</sup> s
$C_J$	junction capacitance	$V_R = 400 \text{ V}$ $f = 1 \text{ MHz}$	$T_{VJ} = 25^{\circ}\text{C}$		25	pF	

Symbol	Definition	Conditions	Ratings			Unit
			min.	typ.	max.	
$(di/dt)_{cr}$	critical rate of rise of current	$T_{VJ} = 150\text{ }^{\circ}\text{C}$ repetitive, $I_T = 150\text{ A}$ $f = 50\text{ Hz}$ ; $t_p = 200\text{ }\mu\text{s}$ $I_G = 0.3\text{ A}$ ; $di_G/dt = 0.3\text{ A}/\mu\text{s}$			150	$\text{A}/\mu\text{s}$
		$V_D = \frac{2}{3} V_{DRM}$ non-repetitive, $I_T = 80\text{ A}$			500	$\text{A}/\mu\text{s}$
$(dv/dt)_{cr}$	critical rate of rise of voltage	$V_D = \frac{2}{3} V_{DRM}$ $T_{VJ} = 150\text{ }^{\circ}\text{C}$ $R_{GK} = \infty$ ; method 1 (linear voltage rise)			1000	$\text{V}/\mu\text{s}$
$V_{GT}$	gate trigger voltage	$V_D = 6\text{ V}$ $T_{VJ} = 25\text{ }^{\circ}\text{C}$ $T_{VJ} = -40\text{ }^{\circ}\text{C}$			1.5	V
$I_{GT}$	gate trigger current	$V_D = 6\text{ V}$ $T_{VJ} = 25\text{ }^{\circ}\text{C}$ $T_{VJ} = -40\text{ }^{\circ}\text{C}$			1.6	V
					95	mA
$V_{GD}$	gate non-trigger voltage	$V_D = \frac{2}{3} V_{DRM}$ $T_{VJ} = 150\text{ }^{\circ}\text{C}$			0.2	V
$I_{GD}$	gate non-trigger current				10	mA
$I_L$	latching current	$t_p = 10\text{ }\mu\text{s}$ $T_{VJ} = 25\text{ }^{\circ}\text{C}$ $I_G = 0.3\text{ A}$ ; $di_G/dt = 0.3\text{ A}/\mu\text{s}$			450	mA
$I_H$	holding current	$V_D = 6\text{ V}$ $R_{GK} = \infty$ $T_{VJ} = 25\text{ }^{\circ}\text{C}$			200	mA
$t_{gd}$	gate controlled delay time	$V_D = \frac{1}{2} V_{DRM}$ $T_{VJ} = 25\text{ }^{\circ}\text{C}$ $I_G = 0.5\text{ A}$ ; $di_G/dt = 0.3\text{ A}/\mu\text{s}$			2	$\mu\text{s}$
$t_q$	turn-off time	$V_R = 100\text{ V}$ ; $I_T = 120\text{ A}$ $T_{VJ} = 150\text{ }^{\circ}\text{C}$ $V_D = \frac{2}{3} V_{DRM}$ ; $t_p = 200\text{ }\mu\text{s}$ $di/dt = 10\text{ A}/\mu\text{s}$ ; $dv/dt = 20\text{ V}/\mu\text{s}$		150		$\mu\text{s}$

Symbol	Definition	Conditions	Ratings			Unit
			min.	typ.	max.	
$I_{RMS}$	RMS current	per terminal			150	A
$R_{thCH}$	thermal resistance case to heatsink			0.10		K/W
$T_{stg}$	storage temperature		-40		150	°C
<b>Weight</b>				30		g
$M_D$	mounting torque		1.1		1.5	Nm
$M_T$	terminal torque		1.1		1.5	Nm
$V_{ISOL}$	isolation voltage	t = 1 second	3000			V
		t = 1 minute	2500			V
$d_{Sppl/App}$	creepage   striking distance on surface   through air	terminal to terminal	10.5	3.2		mm
$d_{Spb/Apb}$	creepage   striking distance on surface   through air	terminal to backside	8.6	6.8		mm

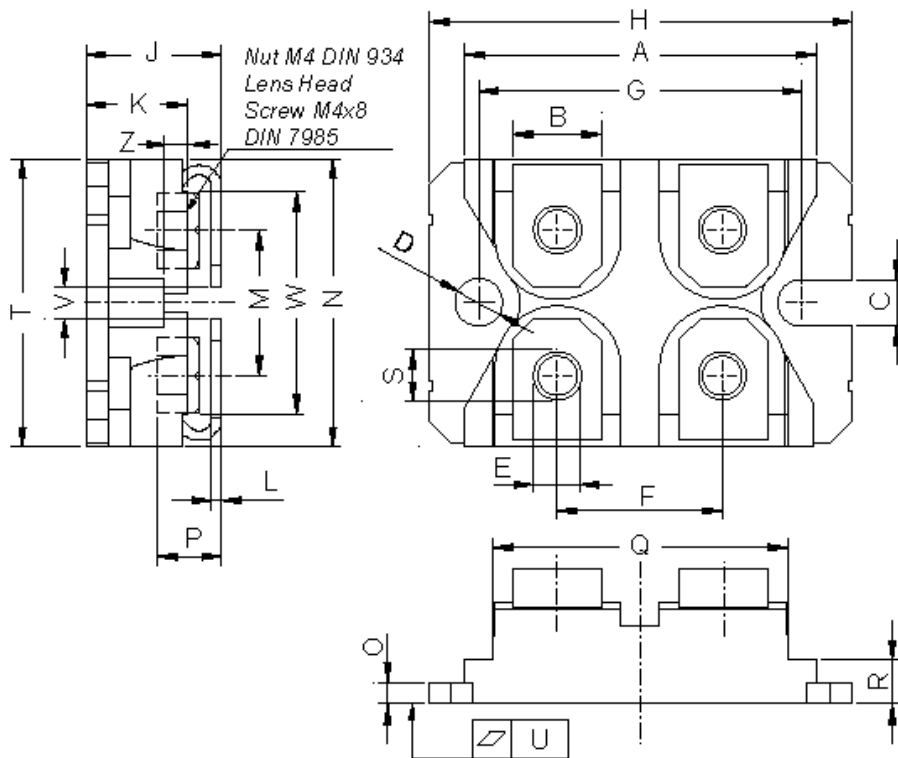
**Part number**

- C = Thyristor (SCR)
- M = Thyristor
- A = (up to 1800 V)
- 80 = Current Rating [A]
- PD = Phase leg, high-side Thyristor / low-side Diode
- 1600 = Reverse Voltage [V]
- NA = SOT-227B (minibloc)

**Product Marking**


Ordering	Part Name	Marking on Product	Delivering Mode	Base Qty	Code Key
Standard	CMA 80 PD 1600 NA	CMA80PD1600NA	Tube	10	509041

## Outlines SOT-227B (minibloc)



Dim.	Millimeter		Inches	
	min	max	min	max
A	31.50	31.88	1.240	1.255
B	7.80	8.20	0.307	0.323
C	4.09	4.29	0.161	0.169
D	4.09	4.29	0.161	0.169
E	4.09	4.29	0.161	0.169
F	14.91	15.11	0.587	0.595
G	30.12	30.30	1.186	1.193
H	37.80	38.23	1.488	1.505
J	11.68	12.22	0.460	0.481
K	8.92	9.60	0.351	0.378
L	0.74	0.84	0.029	0.033
M	12.50	13.10	0.492	0.516
N	25.15	25.42	0.990	1.001
O	1.95	2.13	0.077	0.084
P	4.95	6.20	0.195	0.244
Q	26.54	26.90	1.045	1.059
R	3.94	4.42	0.155	0.167
S	4.55	4.85	0.179	0.191
T	24.59	25.25	0.968	0.994
U	-0.05	0.10	-0.002	0.004
V	3.20	5.50	0.126	0.217
W	19.81	21.08	0.780	0.830
Z	2.50	2.70	0.098	0.106