advanced

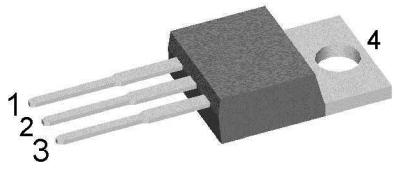
High Efficiency Thyristor

V_{DRM} = 1200 V
I_{TAV} = 20 A
V_T = 1.4 V

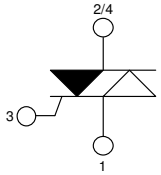
Triode
Single Reverse Conducting Thyristor

Part number

CLA20EF1200PB



Backside: anode



Features / Advantages:

- Thyristor for fast turn-on switching
- Integrated free wheeling diode
- Planar passivated chip
- Long-term stability

Applications:

- Ignition for HD lamps
- Capacity discharge

Package: TO-220

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

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 20150929a

© 2015 IXYS all rights reserved

advanced

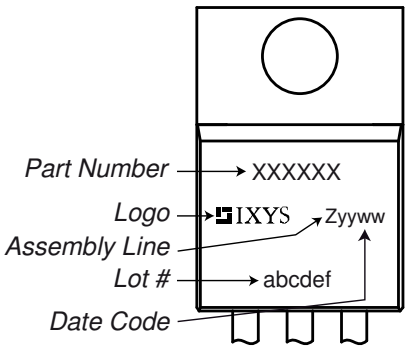
Thyristor				Ratings			
Symbol	**Definition**	**Conditions**		**min.**	**typ.**	**max.**	**Unit**
V_{DSM}	*max. non-repetitive forward blocking voltage*		T_{VJ} = 25°C			1300	V
V_{DRM}	*max. repetitive forward blocking voltage*		T_{VJ} = 25°C			1200	V
I_D	*drain current*	V_D = 1200 V	T_{VJ} = 25°C			10	µA
		V_D = 1200 V	T_{VJ} = 125°C			1	mA
V_T	*forward voltage drop*	I_T = 20 A	T_{VJ} = 25°C			1.40	V
V_F	*reverse voltage drop*	I_F = 40 A				1.60	V
		I_T = 20 A	T_{VJ} = 125°C			1.40	V
		I_F = 40 A				1.60	V
I_{TAV}	*average forward current*	T_C = 115°C	T_{VJ} = 150°C			20	A
		DC					
V_{T0}	*threshold voltage* } *for power loss calculation only*		T_{VJ} = 150°C			0.90	V
r_T	*slope resistance* }					25	mΩ
R_{thJC}	*thermal resistance junction to case*					0.65	K/W
R_{thCH}	*thermal resistance case to heatsink*				0.50		K/W
P_{tot}	*total power dissipation*		T_C = 25°C			190	W
I_{TSM}	*max. forward surge current*	t = 10 ms; (50 Hz), sine	T_{VJ} = 45°C			120	A
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			130	A
		t = 10 ms; (50 Hz), sine	T_{VJ} = 150°C			100	A
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			110	A
I^2t	*value for fusing*	t = 10 ms; (50 Hz), sine	T_{VJ} = 45°C			72	A^2s
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			70	A^2s
		t = 10 ms; (50 Hz), sine	T_{VJ} = 150°C			50	A^2s
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			50	A^2s
C_J	*junction capacitance*	V_R = 400 V f = 1 MHz	T_{VJ} = 25°C		6		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} = 150°C; f = 50 Hz	repetitive, I_T = 60 A			500	A/µs
		t_P = 1 µs; di_G/dt = 0.5 A/µs;	I_{TSA} = 600 A				
		I_G = 0.07 A; V = ⅔ V_{DRM}	non-repet., I_T = 20 A			1500	A/µs
$(dv/dt)_{cr}$	*critical rate of rise of voltage*	V = ⅔ V_{DRM}	T_{VJ} = 150°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			20	mA
			T_{VJ} = -40°C			35	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			30	mA
		I_G = 0.07 A; di_G/dt = 0.5 A/µs					
I_H	*holding current*	V_D = 6 V R_{GK} = ∞	T_{VJ} = 25°C			25	mA
t_{gd}	*gate controlled delay time*	V_D = ½ V_{DRM}	T_{VJ} = 25°C			2	µs
		I_G = 0.07 A; di_G/dt = 0.5 A/µs					
t_q	*turn-off time*	V_R = 0 V; I_T = 20 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				

© 2015 IXYS all rights reserved

advanced

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

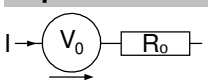
C = Thyristor (SCR)
L = High Efficiency Thyristor
A = (up to 1200V)
20 = Current Rating [A]
EF = Single Reverse Conducting Thyristor
1200 = Reverse Voltage [V]
PB = TO-220AB (3)

Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	CLA20EF1200PB	CLA20EF1200PB	Tube	50	516273

Similar Part	Package	Voltage class
CLA20EF1200PZ	TO-263AB (D2Pak) (2HV)	1200

Equivalent Circuits for Simulation

** on die level* T_{VJ} = 150 °C

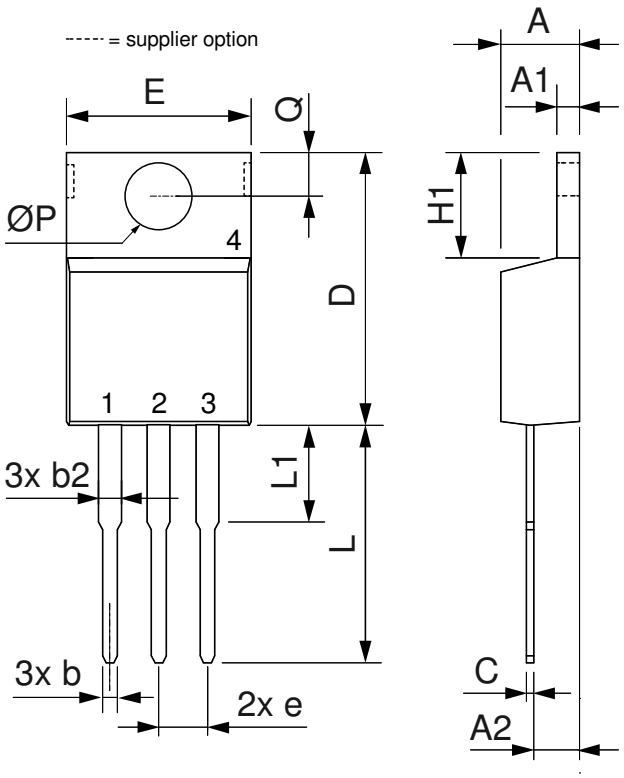


Thyristor

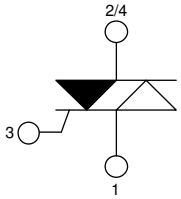
$V_{0\,max}$	*threshold voltage*	0.9	V
$R_{0\,max}$	*slope resistance **	22	mΩ

© 2015 IXYS all rights reserved

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



© 2015 IXYS all rights reserved