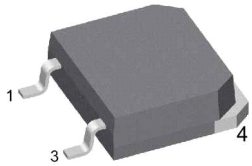
High Efficiency Thyristor

V_{RRM}	=	1200 V
I_{TAV}	=	30 A
V_T	=	1,25 V

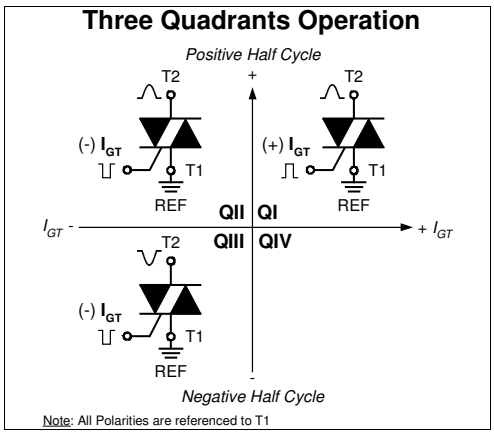
Three Quadrants operation: QI - QIII
1~ Triac

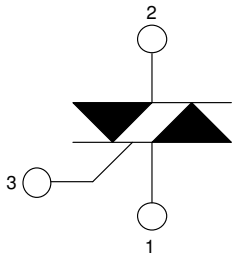
Part number

CLA60MT1200NTZ



Backside: anode/cathode





Features / Advantages:

- Triac for line frequency
- Three Quadrants Operation - QI - QIII
- Planar passivated chip
- Long-term stability of blocking currents and voltages

Applications:

- Line rectifying 50/60 Hz
- Softstart AC motor control
- DC Motor control
- Power converter
- AC power control
- Lighting and temperature control

Package: TO-268AA (D3Pak-HV)

- Industry standard outline
- RoHS compliant
- Epoxy meets UL 94V-0
- High creepage distance between terminals

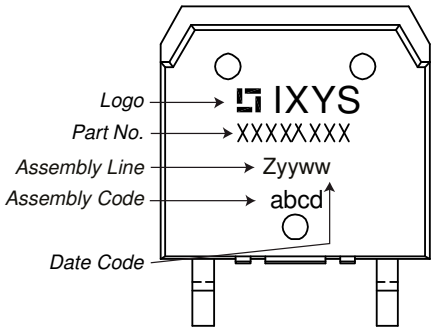
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Rectifier				Ratings			
Symbol	**Definition**	**Conditions**		**min.**	**typ.**	**max.**	**Unit**
$V_{RSM/DSM}$	*max. non-repetitive reverse/forward blocking voltage*		T_{VJ} = 25°C			1300	V
$V_{RRM/DRM}$	*max. repetitive reverse/forward blocking voltage*		T_{VJ} = 25°C			1200	V
$I_{R/D}$	*reverse current, drain current*	$V_{R/D}$ = 1200 V	T_{VJ} = 25°C			10	µA
		$V_{R/D}$ = 1200 V	T_{VJ} = 125°C			2	mA
V_T	*forward voltage drop*	I_T = 30 A	T_{VJ} = 25°C			1,28	V
		I_T = 60 A				1,56	V
		I_T = 30 A	T_{VJ} = 125°C			1,25	V
		I_T = 60 A				1,61	V
I_{TAV}	*average forward current*	T_C = 120°C	T_{VJ} = 150°C			30	A
I_{RMS}	*RMS forward current per phase*	180° sine				66	A
V_{T0}	*threshold voltage* } *for power loss calculation only*		T_{VJ} = 150°C			0,86	V
r_T	*slope resistance* }					12,5	mΩ
R_{thJC}	*thermal resistance junction to case*					0,55	K/W
R_{thCH}	*thermal resistance case to heatsink*				0,15		K/W
P_{tot}	*total power dissipation*		T_C = 25°C			220	W
I_{TSM}	*max. forward surge current*	t = 10 ms; (50 Hz), sine	T_{VJ} = 45°C			380	A
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			410	A
		t = 10 ms; (50 Hz), sine	T_{VJ} = 150°C			325	A
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			350	A
I^2t	*value for fusing*	t = 10 ms; (50 Hz), sine	T_{VJ} = 45°C			720	A^2s
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			700	A^2s
		t = 10 ms; (50 Hz), sine	T_{VJ} = 150°C			530	A^2s
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			510	A^2s
C_J	*junction capacitance*	V_R = 400 V f = 1 MHz	T_{VJ} = 25°C		25		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 = 90 A			150	A/µs
		t_P = 200 µs; di_G/dt = 0,3 A/µs;					
		I_G = 0,3 A; V = ⅔ V_{DRM}	non-repet., I_T = 30 A			500	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			1,7	V
			T_{VJ} = -40°C			1,9	V
I_{GT}	*gate trigger current*	V_D = 6 V	T_{VJ} = 25°C			± 60	mA
			T_{VJ} = -40°C			± 80	mA
V_{GD}	*gate non-trigger voltage*	V = 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			90	mA
		I_G = 0,3 A; di_G/dt = 0,3 A/µs					
I	*holding current*	V_D = 6 V R_{GK} = ∞	T_{VJ} = 25°C			60	mA
t_{gd}	*gate controlled delay time*	V = ½ V_{DRM}	T_{VJ} = 25°C			2	µs
		I_G = 0,3 A; di_G/dt = 0,3 A/µs					
t_q	*turn-off time*	V = 100 V; I_T = 30 A; V = ⅔ V_{DRM}	T_{VJ} = 150 °C		150		µs
		di/dt = 10 A/µs dv/dt = 20 V/µs t_p = 200 µs					

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Package TO-268AA (D3Pak-HV)			Ratings			
Symbol	**Definition**	**Conditions**	**min.**	**typ.**	**max.**	**Unit**
I_{RMS}	*RMS current*	per terminal			70	A
T_{VJ}	*virtual junction temperature*		-40		150	°C
T_{op}	*operation temperature*		-40		125	°C
T_{stg}	*storage temperature*		-40		150	°C
Weight				4		g
F_C	*mounting force with clip*		20		120	N
$d_{Spp/App}$	*creepage distance on surface | striking distance through air*	*terminal to terminal*	9,4			mm
$d_{Spb/Apb}$		*terminal to backside*	5,6			mm

Product Marking



Part description

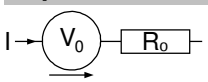
C = Thyristor (SCR)
L = High Efficiency Thyristor
A = (up to 1200V)
60 = Current Rating [A]
MT = 1~ Triac
1200 = Reverse Voltage [V]
N = Three Quadrants operation: QI - QIII
TZ = TO-268AA (D3Pak) (2HV)

Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	CLA60MT1200NTZ	CLA60MT1200NTZ	Tube	30	512767

Similar Part	Package	Voltage class
CLA60MT1200NHB	TO-247AD (3)	1200
CLA60MT1200NHR	ISO247 (3)	1200

Equivalent Circuits for Simulation

** on die level* T_{VJ} = 150 °C

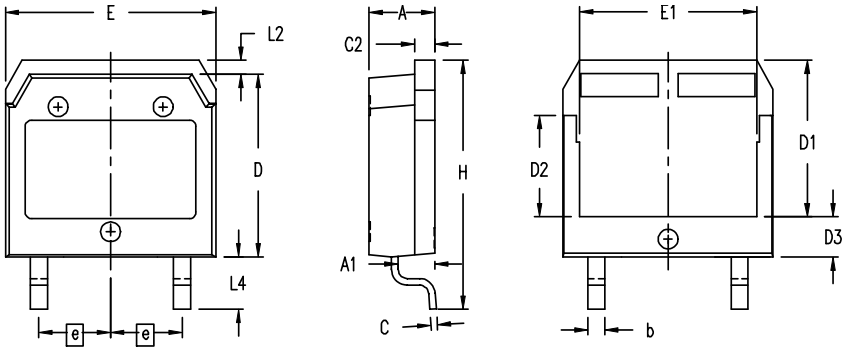


Thyristor

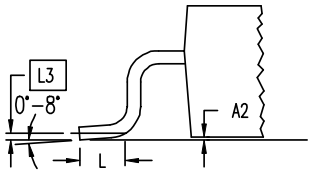
$V_{0\,max}$	*threshold voltage*	0,86	V
$R_{0\,max}$	*slope resistance **	10	mΩ

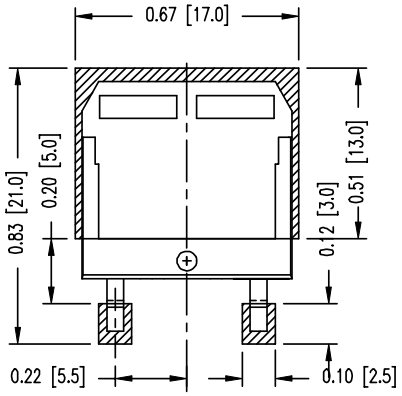
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Outlines TO-268AA (D3Pak-HV)



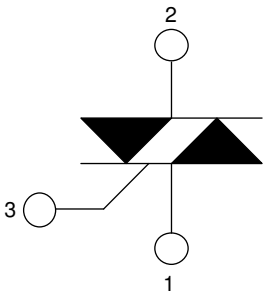






RECOMMENDED MINIMUM FOOT PRINT

Dim.	Millimeter		Inches	
	min	max	min	max
A	4.90	5.10	0.193	0.201
A1	2.70	2.90	0.106	0.114
A2	0.02	0.25	0.001	0.010
b	1.15	1.45	0.045	0.057
C	0.40	0.65	0.016	0.026
C2	1.45	1.60	0.057	0.063
D	13.80	14.00	0.543	0.551
D1	11.80	12.10	0.465	0.476
D2	7.50	7.80	0.295	0.307
D3	2.90	3.20	0.114	0.126
E	15.85	16.05	0.624	0.632
E1	13.30	13.60	0.524	0.535
e	5.450	BSC	0.215	BSC
H	18.70	19.10	0.736	0.752
L	1.70	2.00	0.067	0.079
L2	1.00	1.15	0.039	0.045
L3	0.250	BSC	0.010	BSC
L4	3.80	4.10	0.150	0.161



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Thyristor

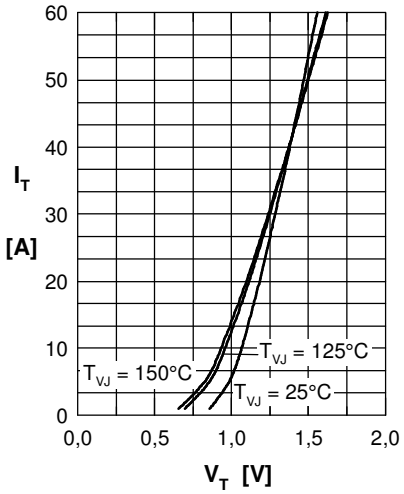


Fig. 1 Forward characteristics

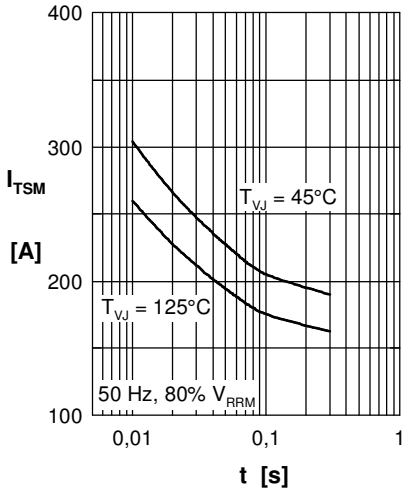


Fig. 2 Surge overload current
I_{TSM}: crest value, t: duration

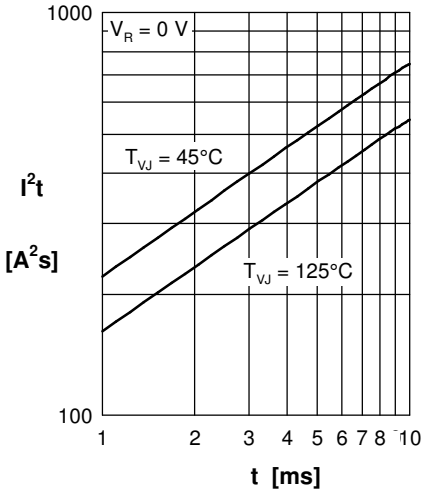


Fig. 3 I^2t versus time (1-10 s)

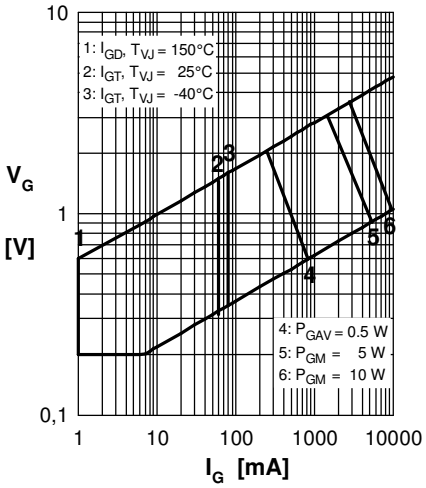


Fig. 4 Gate voltage & gate current

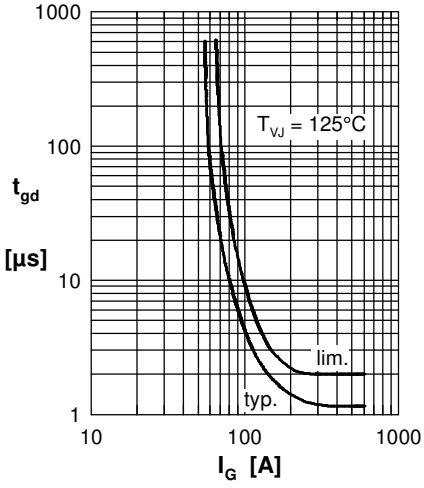


Fig. 5 Gate controlled delay time t_{gd}

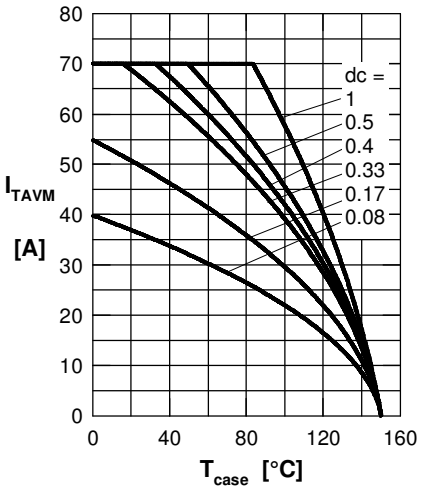


Fig. 6 Max. forward current at case temperature

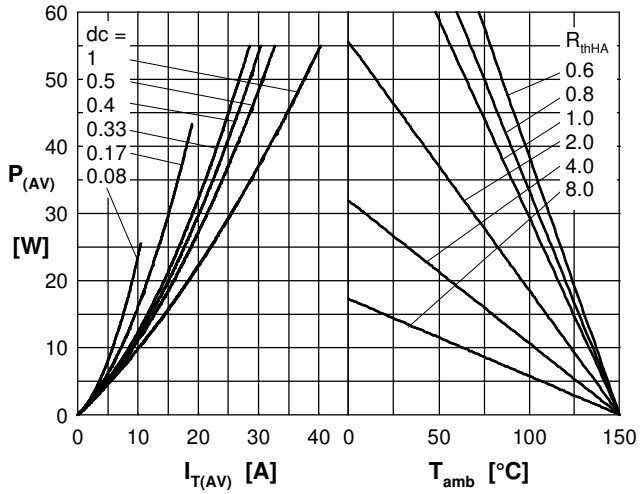
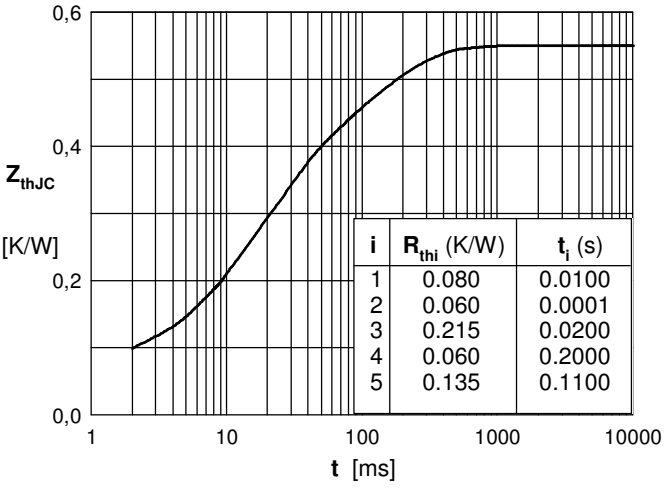


Fig. 7a Power dissipation versus direct output current
Fig. 7b and ambient temperature



i	R_{thi} (K/W)	t_i (s)
1	0.080	0.0100
2	0.060	0.0001
3	0.215	0.0200
4	0.060	0.2000
5	0.135	0.1100

Fig. 7 Transient thermal impedance junction to case

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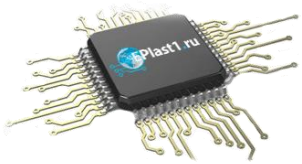
Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits,General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

Телефон: 8 (812) 309 58 32 (многоканальный)
Факс: 8 (812) 320-02-42
Электронная почта: org@eplast1.ru
Адрес: 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.