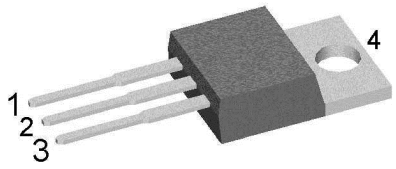
High Efficiency Thyristor

V_{RRM}	=	800 V
I_{TAV}	=	20 A
V_T	=	1.31 V

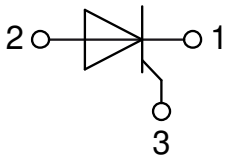
Single Thyristor

Part number

CS19-08ho1



Backside: anode



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-220

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

Disclaimer Notice

Information furnished is believed to be accurate and reliable. However, users should independently evaluate the suitability of and test each product selected for their own applications. Littelfuse products are not designed for, and may not be used in, all applications. Read complete Disclaimer Notice at www.littelfuse.com/disclaimer-electronics.

© 2019 IXYS all rights reserved

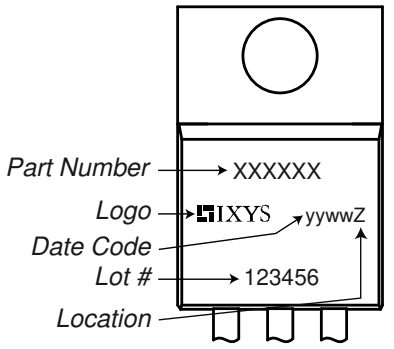
Thyristor

Symbol	Definition	Conditions		Ratings min.	typ.	max.	Unit
$V_{RSM/DSM}$	*max. non-repetitive reverse/forward blocking voltage*		T_{VJ} = 25°C			900	V
$V_{RRM/DRM}$	*max. repetitive reverse/forward blocking voltage*		T_{VJ} = 25°C			800	V
$I_{R/D}$	*reverse current, drain current*	$V_{R/D}$ = 800 V	T_{VJ} = 25°C			50	µA
		$V_{R/D}$ = 800 V	T_{VJ} = 125°C			1	mA
V_T	*forward voltage drop*	I_T = 20 A	T_{VJ} = 25°C			1.32	V
		I_T = 40 A				1.65	V
		I_T = 20 A	T_{VJ} = 125°C			1.31	V
		I_T = 40 A				1.73	V
I_{TAV}	*average forward current*	T_C = 110°C	T_{VJ} = 125°C			20	A
$I_{T(RMS)}$	*RMS forward current*	180° sine				31	A
V_{T0}	*threshold voltage* } *for power loss calculation only*		T_{VJ} = 125°C			0.86	V
r_T	*slope resistance* }					22	mΩ
R_{thJC}	*thermal resistance junction to case*					0.7	K/W
R_{thCH}	*thermal resistance case to heatsink*				0.5		K/W
P_{tot}	*total power dissipation*		T_C = 25°C			170	W
I_{TSM}	*max. forward surge current*	t = 10 ms; (50 Hz), sine	T_{VJ} = 45°C			180	A
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			195	A
		t = 10 ms; (50 Hz), sine	T_{VJ} = 125°C			155	A
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			165	A
I^2t	*value for fusing*	t = 10 ms; (50 Hz), sine	T_{VJ} = 45°C			160	A²s
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			160	A²s
		t = 10 ms; (50 Hz), sine	T_{VJ} = 125°C			120	A²s
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			115	A²s
C_J	*junction capacitance*	V_R = 230 V f = 1 MHz	T_{VJ} = 25°C		9		pF
P_{GM}	*max. gate power dissipation*	t_P = 30 µs	T_C = 125°C			5	W
		t_P = 300 µs				2.5	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			150	A/µs
		t_P = 200 µs; di_G/dt = 0.15 A/µs;					
		I_G = 0.15 A; V = ⅔ V_{DRM}	non-repet., I_T = 20 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			1.5	V
			T_{VJ} = -40°C			2.5	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} = 150°C			0.2	V
I_{GD}	*gate non-trigger current*					3	mA
I_L	*latching current*	t_p = 10 µs	T_{VJ} = 25°C			75	mA
		I_G = 0.1 A; di_G/dt = 0.1 A/µs					
I_H	*holding current*	V_D = 6 V R_{GK} = ∞	T_{VJ} = 25°C			50	mA
t_{gd}	*gate controlled delay time*	V_D = ½ V_{DRM}	T_{VJ} = 25°C			2	µs
		I_G = 0.1 A; di_G/dt = 0.1 A/µs					
t_q	*turn-off time*	V_R = 100 V; I_T = 20A; V = ⅔ V_{DRM}	T_{VJ} = 100 °C		150		µs
		di/dt = 10 A/µs dv/dt = 20 V/µs t_p = 200 µs					

© 2019 IXYS all rights reserved

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		125	°C
T_{op}	*operation temperature*		-40		100	°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

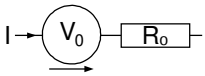


Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	CS19-08ho1	CS19-08ho1	Tube	50	471038

Similar Part	Package	Voltage class
CS19-08ho1S	TO-263AB (D2Pak) (2)	800
CS19-12ho1	TO-220AB (3)	1200
CS19-12ho1S	TO-263AB (D2Pak) (2)	1200

Equivalent Circuits for Simulation

** on die level* $T_{VJ} = 125°C$

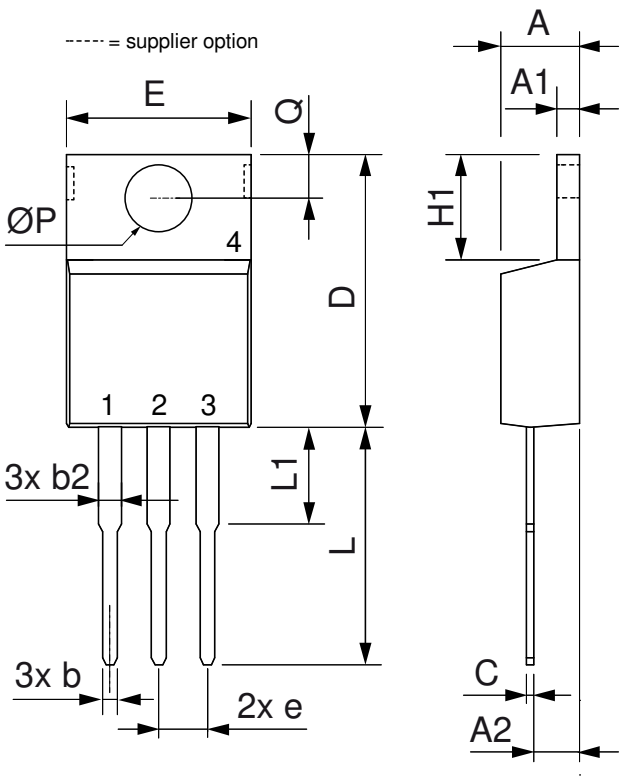


Thyristor

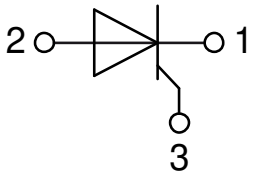
$V_{0\,max}$	*threshold voltage*	0.86	V
$R_{0\,max}$	*slope resistance **	19	mΩ

© 2019 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



© 2019 IXYS all rights reserved

Thyristor

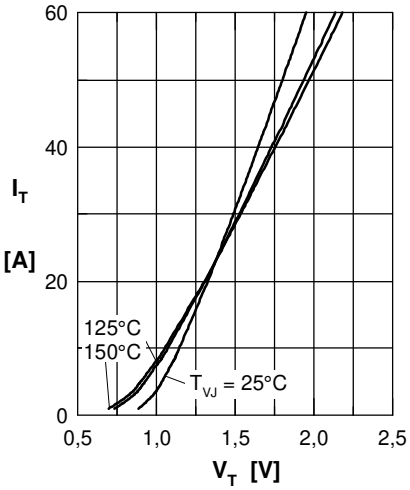


Fig. 1 Forward characteristics

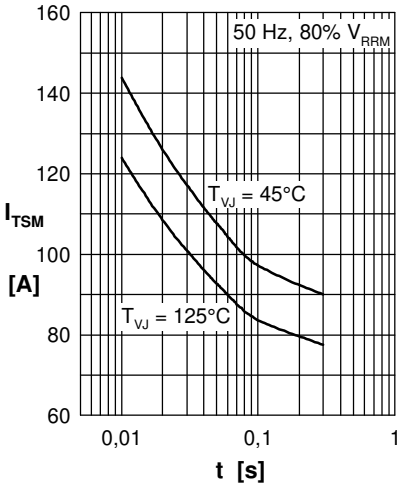


Fig. 2 Surge overload current

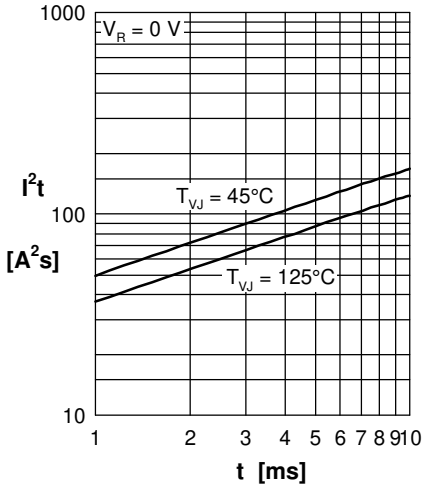


Fig. 3 I^2t versus time (1-10 ms)

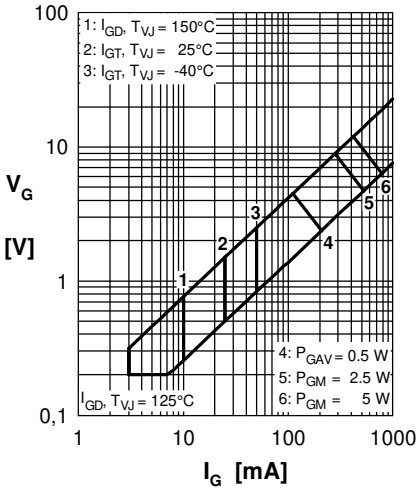


Fig. 4 Gate trigger characteristics

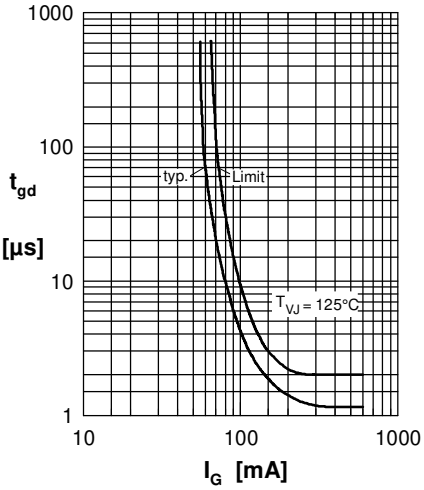


Fig. 5 Gate controlled delay time

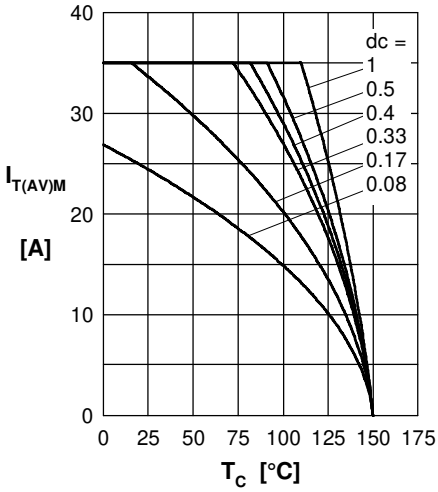


Fig. 6 Max. forward current at case temperature

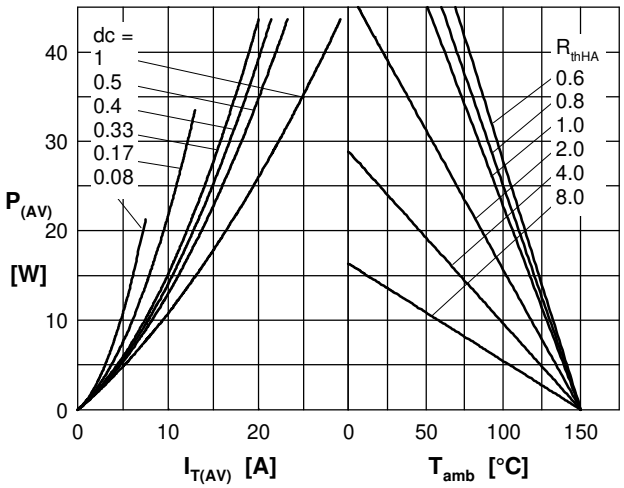


Fig. 7a Power dissipation versus direct output current
Fig. 7b and ambient temperature

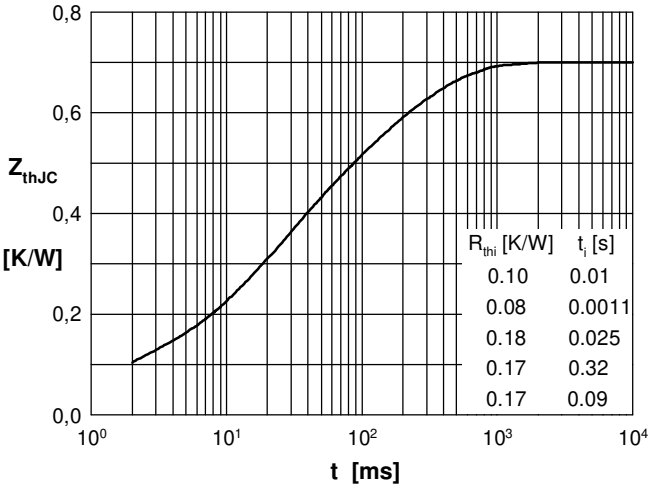


Fig. 8 Transient thermal impedance junction to case

© 2019 IXYS all rights reserved

© 2019 IXYS all rights reserved