Phase Control Thyristor

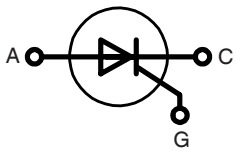
ISOPLUS220™

Electrically Isolated Back Surface

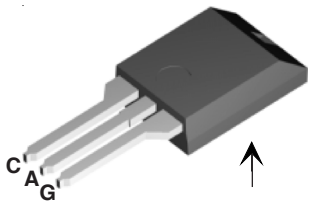
Preliminary Data Sheet

V_{RRM} = 800/1200 V
$I_{T(RMS)}$ = 35 A
$I_{T(AV)M}$ = 23 A

V_{RSM} V_{DSM} V	V_{RRM} V_{DRM} V	Type
800	800	CS 29-08io1C
1200	1200	CS 29-12io1C



ISOPLUS 220™



Isolated back surface*

A = Anode; C = Cathode; G = Gate

Symbol	Conditions		Maximum Ratings	
$I_{T(RMS)}$	$T_{VJ} = T_{VJM}$		35	A
$I_{T(AV)M}$	T_C = 95°C; 180° sine ($I_{T(RMS)}$ current limit)		23	A
I_{TSM}	T_{VJ} = 45°C;	t = 10 ms (50 Hz), sine	200	A
	V_R = 0 V	t = 8.3 ms (60 Hz), sine	215	A
	$T_{VJ} = T_{VJM}$;	t = 10 ms (50 Hz), sine	175	A
	V_R = 0 V	t = 8.3 ms (60 Hz), sine	185	A
I^2t	T_{VJ} = 45°C;	t = 10 ms (50 Hz), sine	200	A^2s
	V_R = 0 V	t = 8.3 ms (60 Hz), sine	195	A^2s
	$T_{VJ} = T_{VJM}$;	t = 10 ms (50 Hz), sine	155	A^2s
	V_R = 0 V	t = 8.3 ms (60 Hz), sine	145	A^2s
$(di/dt)_{cr}$	$T_{VJ} = T_{VJM}$;	repetitive, I_T = 40 A	150	A/µs
	f = 50 Hz; t_P = 200 µs;			
	$V_D = {}^2/_3 V_{DRM}$;			
	I_G = 0.2 A;	non repetitive, $I_T = I_{T(AV)M}$	500	A/µs
	di_G/dt = 0.2 A/µs			
$(dv/dt)_{cr}$	$T_{VJ} = T_{VJM}$;	$V_{DR} = {}^2/_3 V_{DRM}$;	1000	V/µs
	$R_{GK} = \infty$; method 1 (linear voltage rise)			
P_{GM}	$T_{VJ} = T_{VJM}$;	t_P = 30 µs	5	W
	$I_T = I_{T(AV)M}$;	t_P = 300 µs	2.5	W
P_{GAV}			0.5	W
V_{RGM}			10	V
T_{VJ}			-40...+125	°C
T_{VJM}			125	°C
T_{stg}			-40...+125	°C
V_{ISOL}	50/60 Hz RMS; $I_{ISOL} \leq$ 1 mA	2500	V~	
T_L	1.6 mm from case; 10 s		260	°C
F_C	Mounting force		11...65 / 2.4...11	N/lb
Weight			2	g

Features

- Silicon chip on Direct-Copper-Bond substrate
  - High power dissipation
  - Isolated mounting surface
  - 2500 V electrical isolation
- Low cathode-to-tab capacitance (15 pF typical)
- Planar passivated chips
- Epoxy meets UL 94V-0
- High performance glass passivated chip
- Long-term stability of leakage current and blocking voltage

Applications

- Motor control
- Power converter
- AC power controller
- Light and temperature control
- SCR for inrush current limiting in power supplies or AC drive

Advantages

- Space and weight savings
- Simple mounting

Symbol	Conditions		Characteristic Values		
I_R, I_D	$T_{VJ} = T_{VJM}$; $V_R = V_{RRM}$; $V_D = V_{DRM}$		≤	2	mA
V_T	I_T = 45 A; T_{VJ} = 25°C		≤	1.5	V
V_{T0}	For power-loss calculations only (T_{VJ} = 125°C)			0.82	V
r_T				16.5	mΩ
V_{GT}	V_D = 6 V;	T_{VJ} = 25°C	≤	1.0	V
		T_{VJ} = -40°C	≤	1.2	V
I_{GT}	V_D = 6 V;	T_{VJ} = 25°C	≤	65	mA
		T_{VJ} = -40°C	≤	80	mA
V_{GD}	$T_{VJ} = T_{VJM}$; $V_D = {}^2/_3\ V_{DRM}$		≤	0.2	V
I_{GD}			≤	5	mA
I_L	T_{VJ} = 25°C; t_P = 10 µs; I_G = 0.2; di_G/dt = 0.2 A/µs		≤	150	mA
I_H	T_{VJ} = 25°C; V_D = 6 V; R_{GK} = ∞		≤	50	mA
t_{gd}	T_{VJ} = 25°C; V_D = ½ V_{DRM}; I_G = 0.2 A; di_G/dt = 0.2 A/µs		≤	2	µs
R_{thJC}	DC current			1.2	K/W
R_{thCK}	DC current		typical	0.6	K/W
a	Max. acceleration, 50 Hz			50	m/s^2

See CS 30..io1 data sheet for electrical characteristic curves.

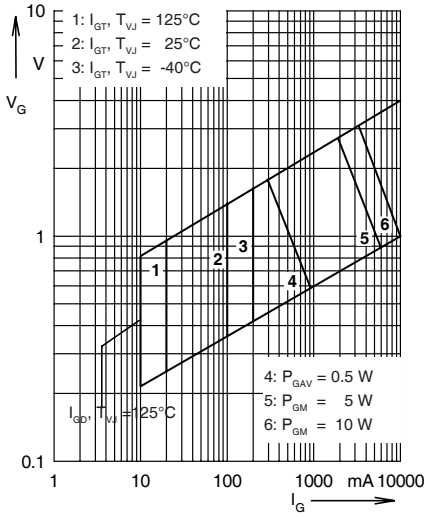


Fig. 1 Gate trigger range

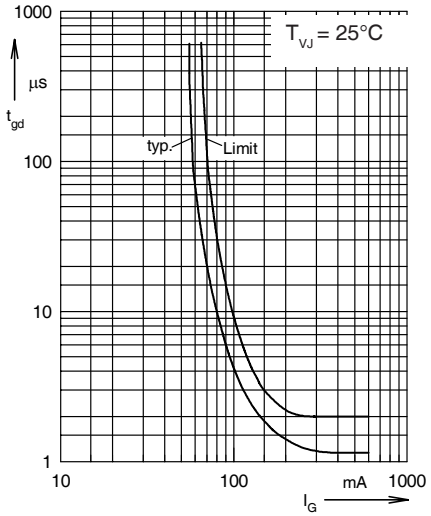
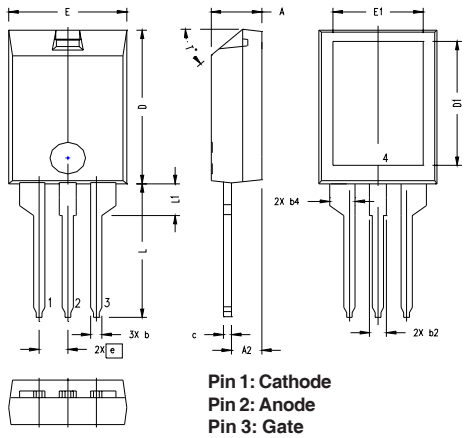


Fig. 2 Gate controlled delay time t_{gd}

ISOPLUS220 Outline



Pin 1: Cathode
Pin 2: Anode
Pin 3: Gate
Pin 4: Anode

SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.157	.197	4.00	5.00
A2	.098	.118	2.50	3.00
b	.035	.051	0.90	1.30
b2	.049	.065	1.25	1.65
b4	.093	.100	2.35	2.55
c	.028	.039	0.70	1.00
D	.591	.630	15.00	16.00
D1	.472	.512	12.00	13.00
E	.394	.433	10.00	11.00
E1	.295	.335	7.50	8.50
e	.100 BASIC		2.55 BASIC	
L	.512	.571	13.00	14.50
L1	.118	.138	3.00	3.50
T°			42.5°	47.5°

NOTE:
1. Bottom heatsink (Pin 4) is electrically isolated from Pin 1, 2, or 3.
2. This drawing will meet dimensional requirement of JEDEC SS Product Outline TO-273 except D and D1 dimension.

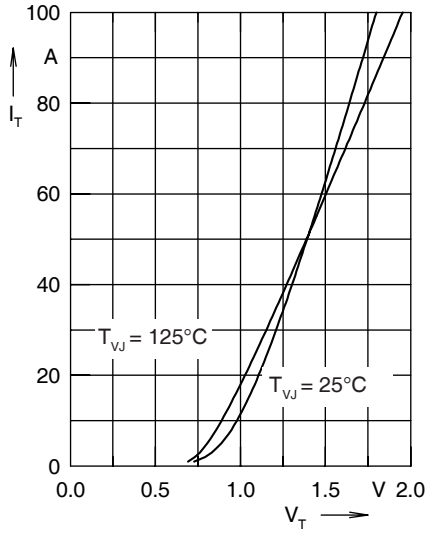


Fig. 3 Forward characteristics

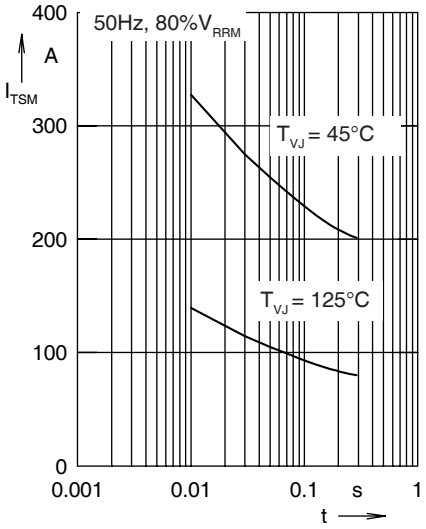


Fig. 4 Surge overload current
I_{TSM}: crest value, t: duration

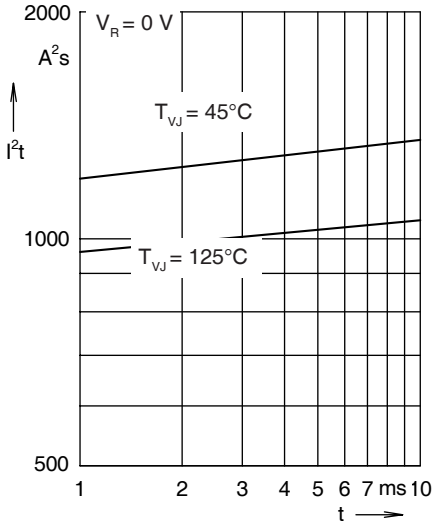


Fig. 5 I^2t versus time (1-10 ms)

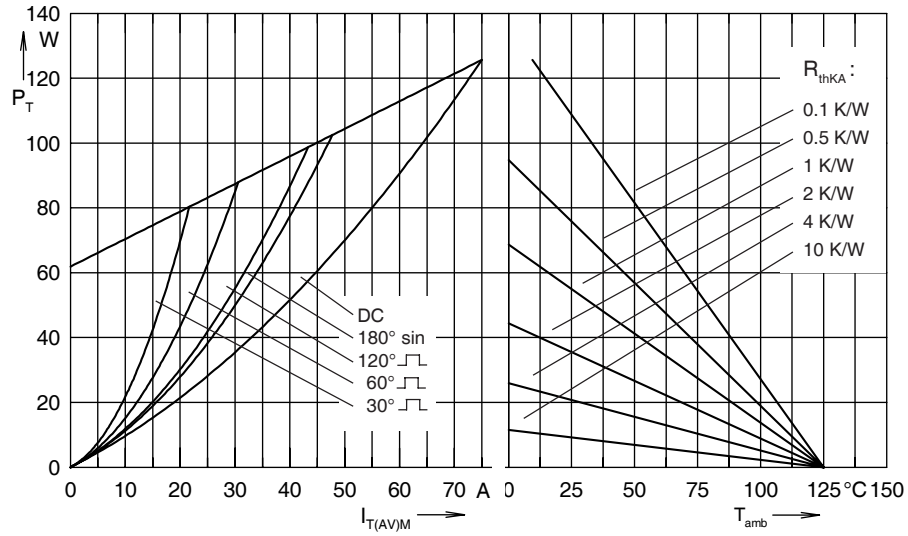


Fig. 6 Power dissipation versus forward current and ambient temperature