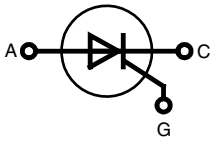
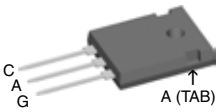
Phase Control Thyristor

V_{RRM} = 800-1600 V
$I_{T(RMS)}$ = 75 A
$I_{T(AV)M}$ = 48 A

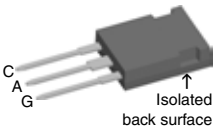
V_{RSM} V_{DSM} V	V_{RRM} V_{DRM} V	Type	
900	800	CS 45-08 io1	
1300	1200	CS 45-12 io1	
1700	1600	CS 45-16 io1	CS 45-16 io1R



TO-247 AD
Version io1



ISOPLUS247™
Version io1R



A = Anode, C = Cathode, G = Gate

Symbol	Conditions		Maximum Ratings	
I_{TRMS}	$T_{VJ} = T_{VJM}$		75	A
$I_{T(AV)M}$	T_C = 75°C, 180° sine		48	A
I_{TSM}	T_{VJ} = 45°C	t = 10 ms (50 Hz), sine	520	A
	V_R = 0 V	t = 8.3 ms (60 Hz), sine	560	A
	$T_{VJ} = T_{VJM}$	t = 10 ms (50 Hz), sine	460	A
	V_R = 0	t = 8.3 ms (60 Hz), sine	500	A
I^2t	T_{VJ} = 45°C	t = 10 ms (50 Hz), sine	1350	A^2s
	V_R = 0 V	t = 8.3 ms (60 Hz), sine	1300	A^2s
	$T_{VJ} = T_{VJM}$	t = 10 ms (50 Hz), sine	1050	A^2s
	V_R = 0 V	t = 8.3 ms (60 Hz), sine	1030	A^2s
$(di/dt)_{cr}$	$T_{VJ} = T_{VJM}$; f = 50 Hz; t_p = 200 µs	repetitive, I_T = 40 A	150	A/µs
	$V_D = {}^2/_3 V_{DRM}$; I_G = 0.3 A; di_G/dt = 0.3 A/µs	non repetitive, $I_T = I_{T(AV)M}$	500	A/µs
$(dv/dt)_{cr}$	$T_{VJ} = T_{VJM}$; $V_D = {}^2/_3 V_{DRM}$; $R_{GK} = \infty$; method 1 (linear voltage rise)		1000	V/µs
P_{GM}	$T_{VJ} = T_{VJM}$; t_p = 30 µs		10	W
	$I_T = I_{T(AV)M}$; t_p = 300 µs		5	W
P_{GAV}			0.5	W
V_{RGM}			10	V
T_{VJ}			-40 ... +140	°C
T_{VJM}			140	°C
T_{stg}			-40 ... 125	°C
M_d	Version io1: mounting torque M3		0.8...1.2	Nm
F_C	Version io1R: mounting force with clip		20...120	N
V_{ISOL} *	50/60 Hz, RMS, t = 1 minute, leads-to-tab		2500	V~
Weight	typ.		6	g

* Version io1R only

Data according to IEC 60747

Features

- Thyristor for line frequency
- International standard package JEDEC TO-247
- Planar passivated chip
- Long-term stability of blocking currents and voltages
- Version AR isolated and UL registered E153432
- Epoxy meets UL 94V-0

Applications

- Motor control
- Power converter
- AC power controller
- Switch-mode and resonant mode power supplies
- Light and temperature control

Advantages

- Easy to mount with 1 screw (isolated mounting screw hole)
- Space and weight savings
- Simple mounting
- Improved temperature and power cycling

Symbol	Conditions		Characteristic Values min.	max.	
I_R, I_D	$V_R = V_{RRM}$; $V_D = V_{DRM}$;	$T_{VJ} = T_{VJM}$		5	mA
V_T	I_T = 80 A;	T_{VJ} = 25°C		1.64	V
V_{TO}	For power-loss calculations only			0.85	V
r_T		T_{VJ} = 125°C		11	mΩ
V_{GT}	V_D = 6 V;	T_{VJ} = 25°C		1.5	V
		T_{VJ} = -40°C		1.6	V
I_{GT}	V_D = 6 V;	T_{VJ} = 25°C		100	mA
		T_{VJ} = -40°C		200	mA
V_{GD}	$V_D = {}^2/_3 V_{DRM}$;	$T_{VJ} = T_{VJM}$		0.2	V
I_{GD}				10	mA
I_L	t_p = 10 µs; I_G = 0.3 A; di_G/dt = 0.3 A/µs	T_{VJ} = 25°C		150	mA
I_H	V_D = 6 V; R_{GK} = ∞;	T_{VJ} = 25°C		100	mA
t_{gd}	V_D = ½ V_{DRM}; I_G = 0.3 A; di_G/dt = 0.3 A/µs	T_{VJ} = 25°C		2	µs
R_{thJC}	DC current			0.62	K/W
R_{thJH}	DC current			0.82	K/W
a	Max. acceleration; 50 Hz			50	m/s^2

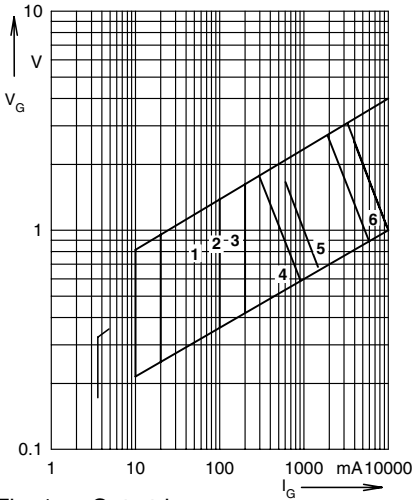


Fig. 1 Gate trigger range

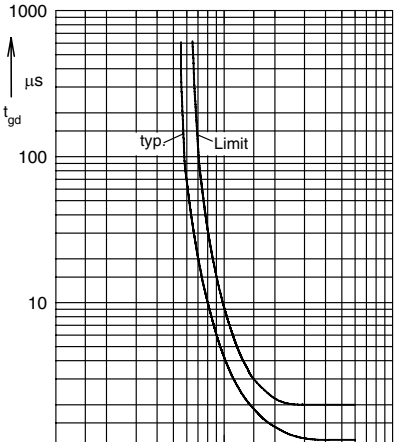


Fig. 2 Gate controlled delay time t_{gd}

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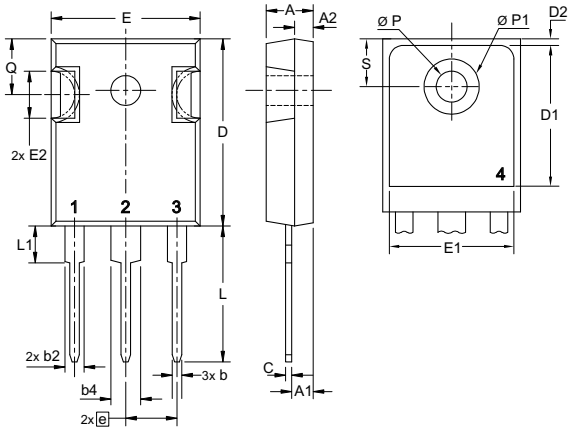
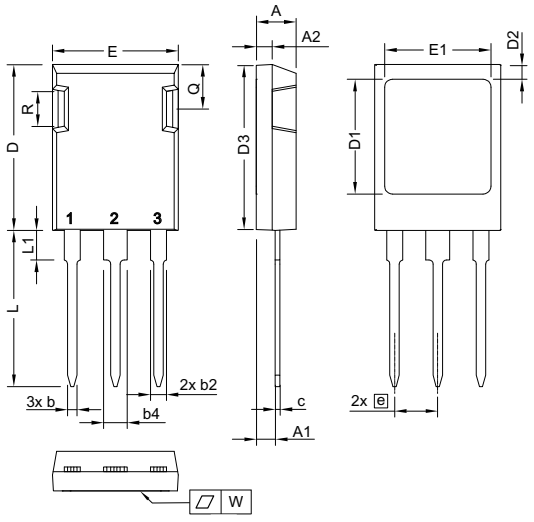


Dim.	Millimeter min	Millimeter max	Inches min	Inches max
A	4.70	5.30	0.185	0.209
A1	2.21	2.59	0.087	0.102
A2	1.50	2.49	0.059	0.098
b	0.99	1.40	0.039	0.055
b2	1.65	2.39	0.065	0.094
b4	2.59	3.43	0.102	0.135
c	0.38	0.89	0.015	0.035
D	20.79	21.45	0.819	0.845
D1	13.07	-	0.515	-
D2	0.51	1.35	0.020	0.053
E	15.48	16.24	0.610	0.640
E1	13.45	-	0.53	-
E2	4.31	5.48	1.170	0.216
e	5.46 BSC		0.2150 BSC	
L	19.80	20.30	0.078	0.800
L1	-	4.49	-	0.177
Ø P	3.55	3.65	0.140	0.144
ØP1	-	7.39	-	0.290
Q	5.38	6.19	0.212	0.244
S	6.14 BSC		0.242 BSC	

ISOPLUS 247™



Dim.	Millimeter min	Millimeter max	Inches min	Inches max
A	4.83	5.21	0.190	0.205
A1	2.29	2.54	0.090	0.100
A2	1.91	2.16	0.075	0.085
b	1.14	1.40	0.045	0.055
b2	1.91	2.20	0.075	0.087
b4	2.92	3.24	0.115	0.128
c	0.61	0.83	0.024	0.033
D	20.80	21.34	0.819	0.840
D1	15.75	16.26	0.620	0.640
D2	1.65	2.15	0.065	0.085
D3	20.30	20.70	0.799	0.815
E	15.75	16.13	0.620	0.635
E1	13.21	13.72	0.520	0.540
e	5.45 BSC		0.215 BSC	
L	19.81	20.60	0.780	0.811
L1	3.81	4.38	0.150	0.172
Q	5.59	6.20	0.220	0.244
R	4.25	5.50	0.167	0.217
W	-	0.10	-	0.004

Die konvexe Form des Substrates ist typ. < 0.04 mm über der Kunststoffoberfläche der Bauteilunterseite
The convex bow of substrate is typ. < 0.04 mm over plastic surface level of device bottom side

Die Gehäuseabmessungen entsprechen dem Typ TO-247 AD gemäß JEDEC außer Schraubloch und $L_{max.}$
This drawing will meet all dimensions requirement of JEDEC

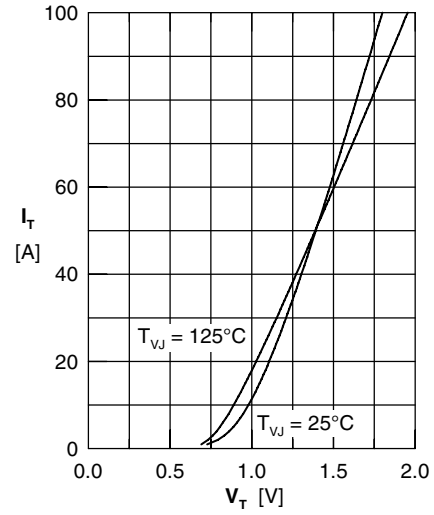


Fig. 3 Forward characteristics

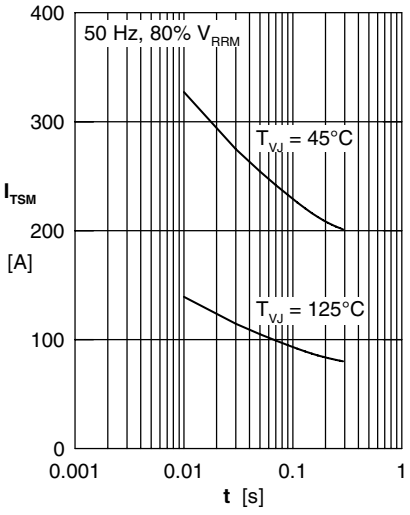


Fig. 4 Surge overload current
I_{TSM}: crest value, t: duration

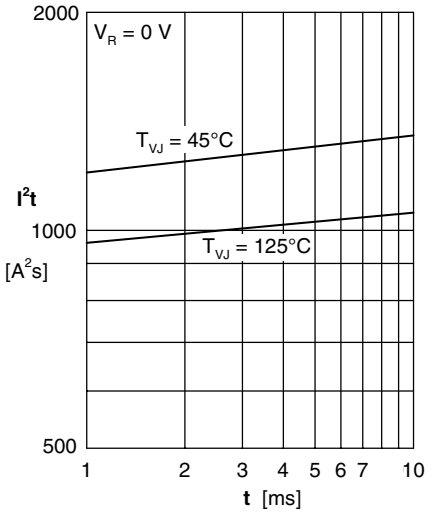


Fig. 5 I^2t versus time (1-10 s)

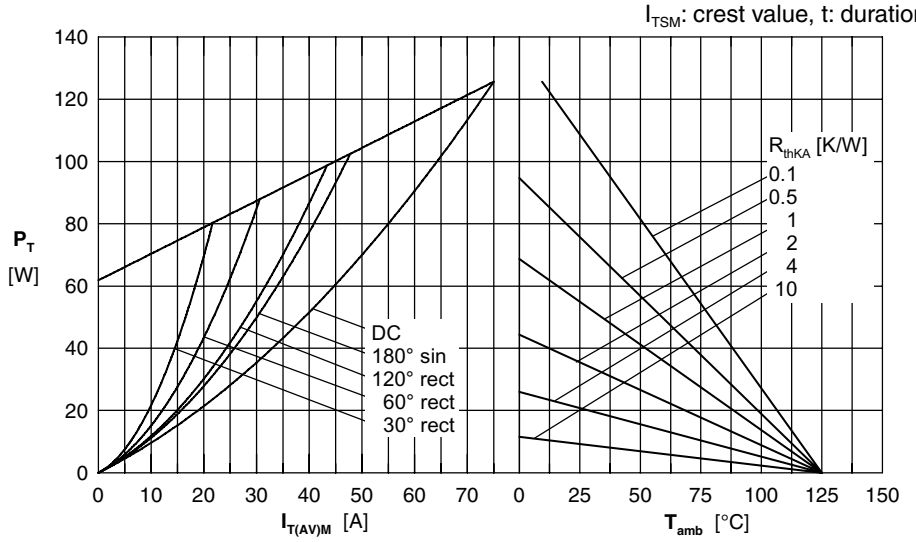


Fig. 6 Power dissipation versus forward current and ambient temperature

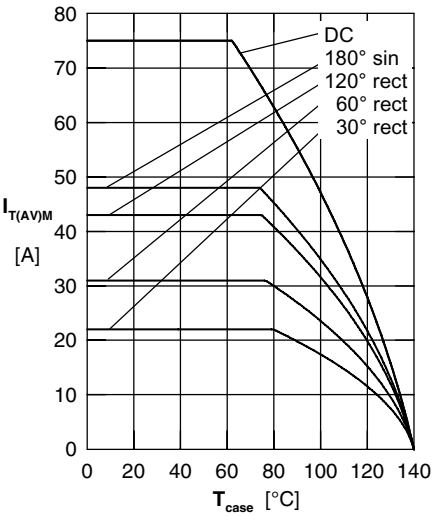


Fig. 7 Max. forward current at case temperature

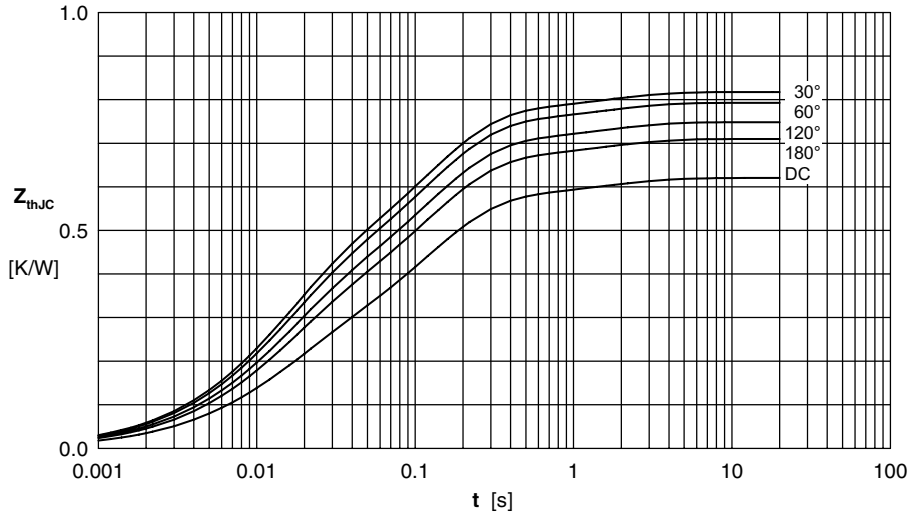


Fig. 8 Transient thermal impedance junction to case

R_{thJC} for various conduction angles d:

d	R_{thJC} (K/W)
DC	0.62
180°	0.71
120°	0.748
60°	0.793
30°	0.817

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.206	0.013
2	0.362	0.118
3	0.052	1.488