

Thyristor Modules

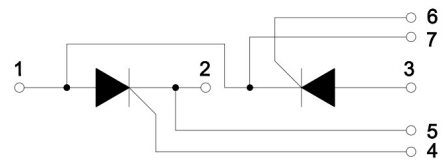
Features

- Blocking voltage: 800 to 1800V
- Heat transfer through aluminum oxide DBC
Ceramic isolated metal baseplate
- Industrial standard package
- Thick copper baseplate
- 2500 V_{RMS} isolating voltage



Typical Applications

- Power Converters
- DC motor Control and Drives
- Temperature control
- Lighting control



Module Type

Type	V _{DRM}	V _{RSM}
HKT106-16	1600V	1700V

Maximum Ratings

Parameters	Symbol	Test Conditions	Values	Unit
Average On-State Current	I _{TAV}	Sine 180°C; T _C =85°C	110	A
Surge forward current	I _{TSM}	t=10ms T _J =45°C	2250	A
		t=10ms T _J =125°C	1900	
Maximum I ² t for fusing	I ² t	t=10ms T _J =45°C	25000	A ² s
		t=10ms T _J =125°C	18000	
Isolation Breakdown Voltage(R.M.S)	Visol	A _C 50Hz; R.M.S.; 1min	2500	V
		Ac.50Hz; R.M.S; 1sec	3500	V
Operating Junction Temperature	T _J		-40~+125	°C
Storage Temperature	T _{stg}		-40~+125	°C
Mounting Torque	Mt	To terminals(M5)	3 ± 15%	Nm
	Ms	To heatsink(M6)	5 ± 15%	
Maximum non-repetitive rate of rise of turned on current	di/dt	T _J =25°C from 0.67V _{DRM} , I _{TM} = π × I _{T(AV)} , I _g =500mA tr<0.5us tp>6us	150	A/us

Maximum critical rate of rise of off-state voltage	dv/dt	$T_J = 125^{\circ}\text{C}, V_D = 2/3V_{\text{DRM}}$	1000	V/us
Maximum allowable acceleration	a		50	m/s ²
Module(Approximately)	Weight		100	g

Electrical Characteristics						
Parameters	Symbol	Test Conditions	Values			Unit
			Min.	Typ.	Max.	
Maximum Peak On-State Voltage	V_{TM}	$I_{\text{TM}} = \pi \times I_{\text{T(AV)}}, T_J = 25^{\circ}\text{C}$			1.65	V
Maximum Repetitive Peak Reverse Current/ Maximum Repetitive Off-state Current	$I_{\text{RRM}}/ I_{\text{DRM}}$	$T_J = 125^{\circ}\text{C}, V_{\text{RD}} = V_{\text{RRM}}$			20	mA
On state threshold voltage	V_{TO}	For power-loss calculations only $T_J = 125^{\circ}\text{C}$			0.9	V
Maximum Value of on-state slope resistance	r_{T}	$T_J = 125^{\circ}\text{C}$			2.0	m Ω
Maximum gate voltage required to trigger	V_{GT}	$T_J = 25^{\circ}\text{C}, V_D = 6\text{V}$			3.0	V
Maximum gate current required to trigger	I_{GT}	$T_J = 25^{\circ}\text{C}, V_D = 6\text{V}$			150	mA
Maximum gate voltage that will not trigger	V_{GD}	$T_J = 125^{\circ}\text{C}, V_D = 2/3V_{\text{DRM}}$			0.25	V
Maximum gate current that will not trigger	I_{GD}	$T_J = 125^{\circ}\text{C}, V_D = 2/3V_{\text{DRM}}$			6	mA
Maximum Latching current	I_{L}	$T_J = 25^{\circ}\text{C}, I_{\text{G}} = 1.2I_{\text{GT}}$			500	mA
Maximum Holding current	I_{H}	$T_J = 25^{\circ}\text{C}, I_{\text{T}} = 1\text{A}$			250	mA
Maximum peak gate power	P_{GM}				10	W
Maximum average gate power	$P_{\text{G(AV)}}$				3	W
Maximum peak gate current	I_{GM}				3	A
Maximum peak negative gate voltage	V_{GM}				10	V
total power dissipation	P_{tot}				318	W
Gate controlled delay time	tgd	$T_J = 25^{\circ}\text{C}, I_{\text{G}} = 1\text{A}, di_{\text{G}}/dt = 1\text{A/us}$	1			us
Circuit commutated turn-off time	tq	$T_J = 125^{\circ}\text{C}$	100			us

Thermal Characteristics				
Parameters	Symbol	Test Conditions	Values	Unit
Maximum internal thermal resistance, junction to case	$R_{th(j-c)}$	Per thyristor/ Per module	0.28/0.14	$^{\circ}\text{C}/\text{W}$
Typical thermal resistance, case to heatsink	$R_{th(c-s)}$	Per thyristor/ Per module	0.20/0.10	$^{\circ}\text{C}/\text{W}$

Performance Curves

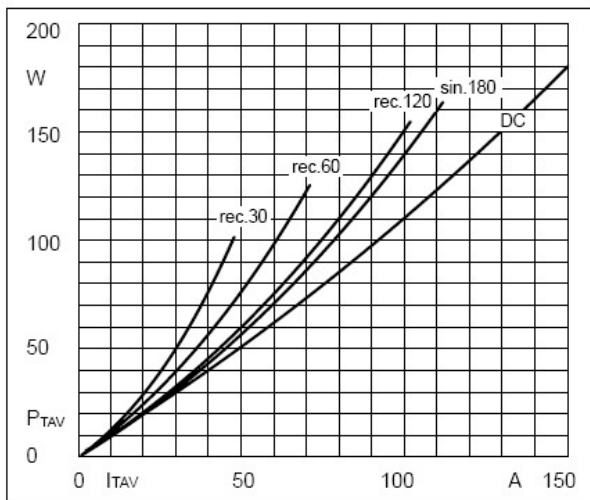


Fig1. Power dissipation

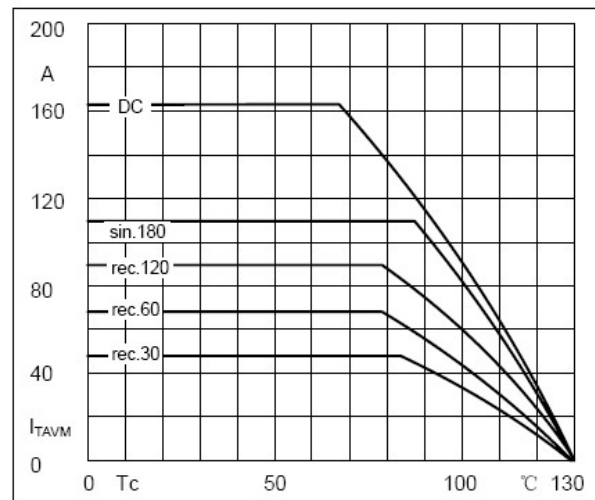


Fig2. Forward Current Derating Curve

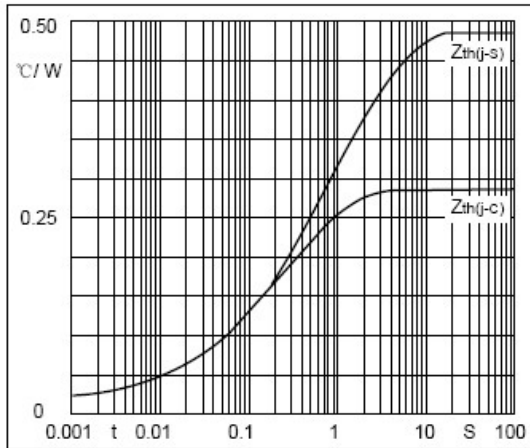


Fig3. Transient thermal impedance

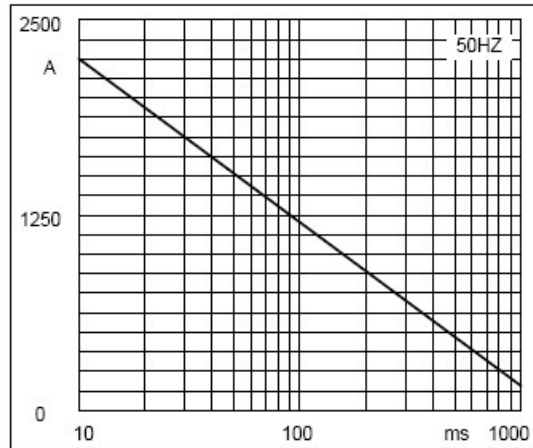


Fig4. Max Non-Repetitive Forward Surge Current

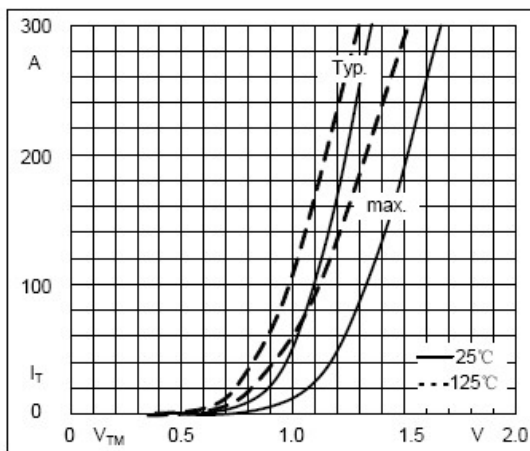


Fig5. Forward Characteristics

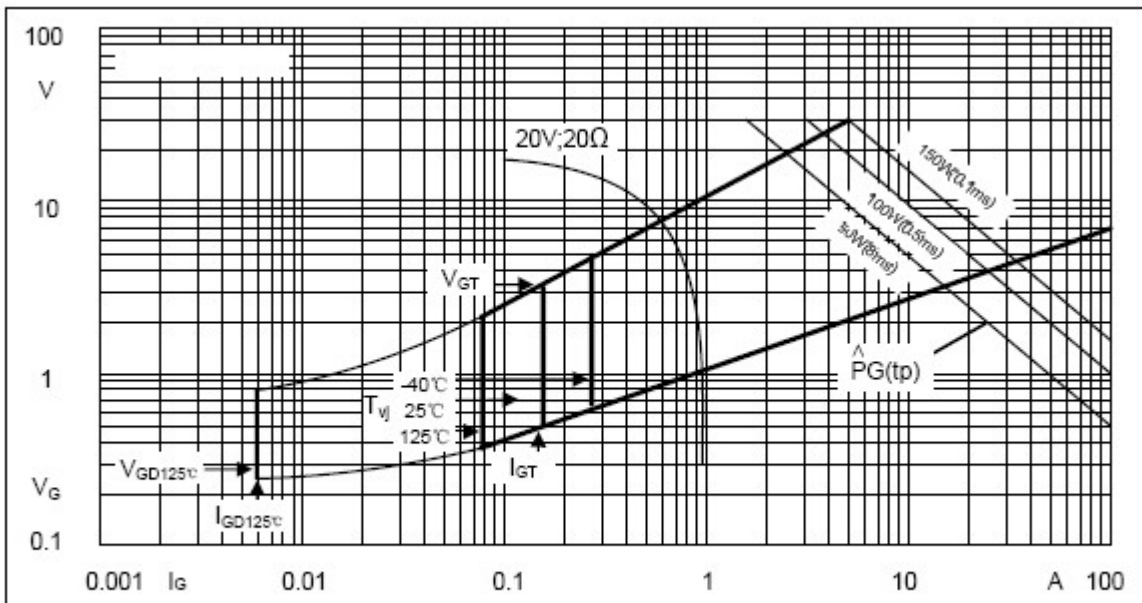
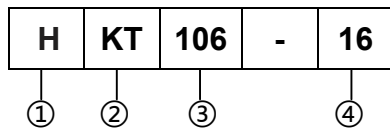


Fig6. Gate trigger Characteristics

Ordering Information Tabel

Device code



- ① HSM's power module
- ② Circuit configuration
- ③ Maximum average forward current, A
- ④ Voltage code 1600V

Package Outline Information

T1 dimensions in mm

