

STUD TYPETHYRISTOR**Features**

- Hermetic ceramic -metal seal
- high dv/dt
- tested according to IEC standards
- High surge capability
- Compression Bonded Encapsulation for heavy duty operations such as severe thermal cycling

50A**Typical Applications**

- DC motor controls
- Controlled DC power supplies
- AC controllers

Major Ratings and Characteristics

Parameters		KP50A	Units
$I_{T(AV)}$		50	A
	@ T_c	85	°C
$I_{T(RMS)}$		72	A
I_{TSM}	@ 50Hz	900	A
	@ 60Hz	1050	A
$I^2 t$	@ 50Hz	5	KA ² s
	@ 60Hz	4	KA ² s
V_{DRM} / V_{RRM}	MAX	1600	V
T_q	typical	200	µs
T_J	range	- 40 to 125	°C

ELECTRICAL SPECIFICATIONS

Voltage Ratings

Type number	Voltage Code	V_{RRM} / V_{DRM} , maximum repetitive peak reverse voltage V	V_{RSM} , maximum non-repetitive peak rev. voltage V	I_{RRM} / I_{DRM} max. @ $T_J = T_J$ max. mA
KP50A	02	200	300	15
	06	600	700	
	10	1000	1100	
	12	1200	1300	
	16	1600	1700	

On-state Conduction

Parameter	KP50A	Units	Conditions		
$I_{T(AV)}$ Maximum average on-state current @ Case temperature	45	A	180° conduction, half sine wave		
	90	°C			
$I_{(RMS)}$ Maximum RMS on-state current	72	A	180° conduction, half sine wave @ $T_C = 80^\circ\text{C}$		
I_{TSM} Maximum peak, one-cycle non-repetitive surge current	900	A	t = 10ms	No voltage	Sinusoidal half wave, Initial $T = T_{max}$.
	1050		t = 8.3ms	reapplied	
	800		t = 10ms	100% V_{RRM}	
	850		t = 8.3ms	reapplied	
$I^2 t$ Maximum $I^2 t$ for fusing	5	KA ² s	t = 10ms	No voltage	
	4		t = 8.3ms	reapplied	
	3.5		t = 10ms	100% V_{RRM}	
	3		t = 8.3ms	reapplied	
$I^2 \sqrt{t}$ Maximum $I^2 \sqrt{t}$ for fusing	364	KA ² √s	t = 0.1 to 10ms, no voltage reapplied		
V_{TM} Maximum on-state or forward	1.30	V	pk = 600A, $T_J = 25^\circ\text{C}$, t p = 10ms sine pulse		
I_H Maximum holding current	100	mA	$T_J = 25^\circ\text{C}$, anode supply 12V resistive load		
I_L Typical latching current	300				

Switching

Parameter	KP50A	Units	Conditions
di/dt Max. non-repetitive rate of rise of turned-on current	50	A/μs	Gate drive 20V, 20Ω, tr ≤ 1μs $T_J = T_J$ max, anode voltage ≤ 80% V_{DRM}
td Typical delay time	2.0	μs	Gate current 1A, dig/dt = 1A/μs $V_d = 0.67\% V_{DRM}$, $T_J = 25^\circ\text{C}$
Tq Typical turn-off time	200	μs	$I_{TM} = 300\text{A}$, $T_J = T_J$ max, di/dt = 20A/μs, $V_R = 50\text{V}$ dv/dt = 20V/μs, Gate 0V 100Ω, tp = 500μs

Blocking

Parameter	KP50A	Units	Conditions
dv/dt Maximum critical rate of rise of off-state voltage	1000	V/μs	T _J = T _J max linear to 80% rated V _{DRM}
I _{DRM} Max. peak reverse and off-state leakage current	20	mA	T _J = T _J max, rated V _{DRM} /V _{RRM} applied

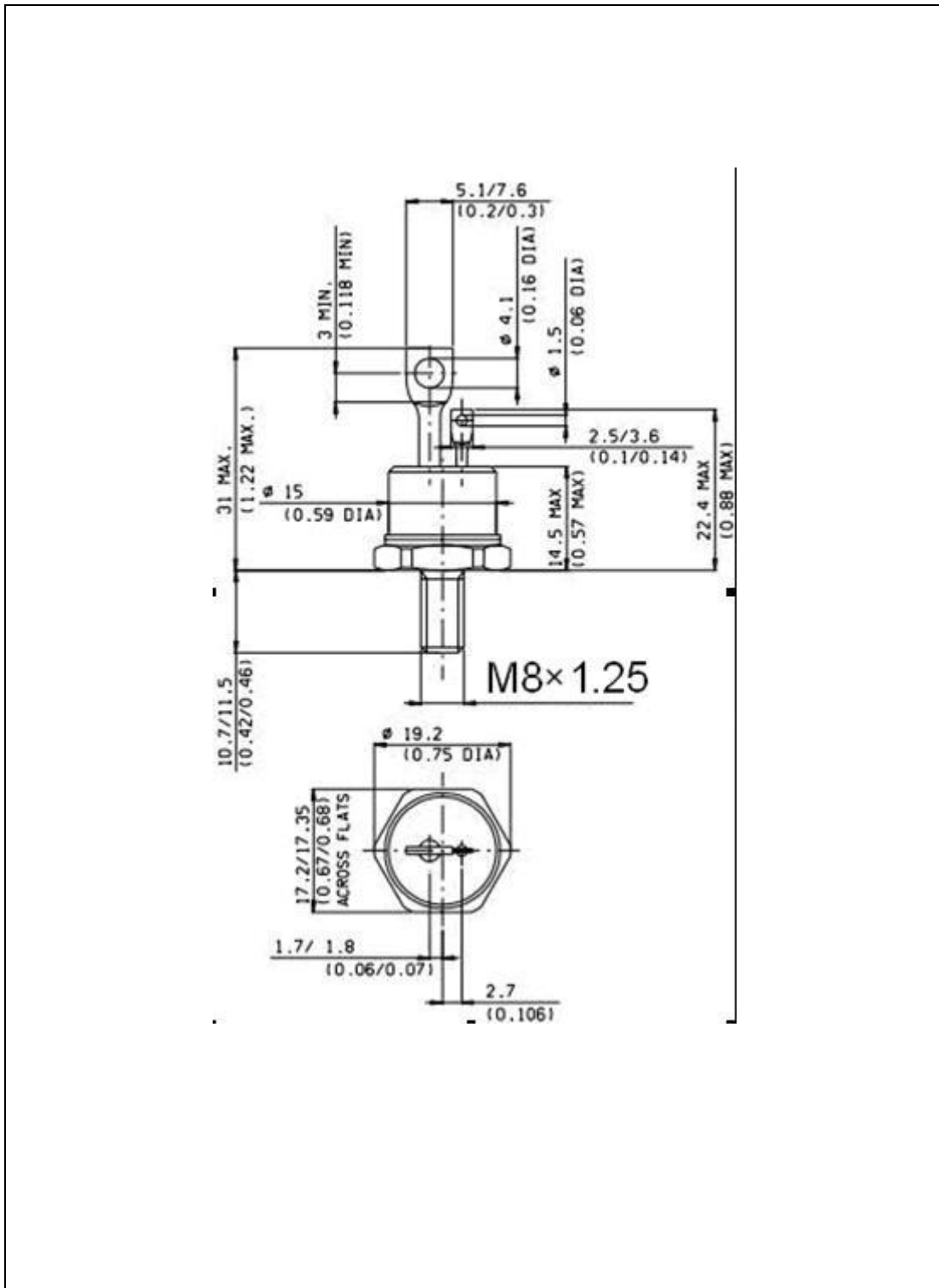
Triggering

Parameter	KP50A		Units	Conditions
P _{GM} Maximum peak gate power	5		W	T _J = T _J max, t _p ≤ 5ms
P _{G(AV)} Maximum average gate power	1.0			T _J = T _J max, f = 50Hz, d% = 50
I _{GM} Max. peak positive gate current	2.0		A	T _J = T _J max, t _p ≤ 5ms
+V _{GM} Maximum peak positive gate voltage	20		V	T _J = T _J max, t _p ≤ 5ms
-V _{GM} Maximum peak negative gate voltage	5.0			
I _{GT} DC gate current required to trigger	TYP.	MAX.	mA	T _J = -40°C T _J = 25°C T _J = 125°C Max. required gate trigger/ current/ voltage are the lowest value which will trigger all units 12V anode-to-cathode applied
	180	-		
	90	150		
V _{GT} DC gate voltage required to trigger	2.9	-	V	T _J = -40°C T _J = 25°C T _J = 125°C
	1.8	30		
	1.2	-		
I _{GD} DC gate current not to trigger	8		mA	T _J = T _J max Max. gate current/ voltage not to trigger is the max. value which will not trigger any unit with rated V anode-to-cathode applied
V _{GD} DC gate voltage not to trigger	0.25			

Thermal and Mechanical Specification

Parameter	KP50A	Units	Conditions
T _J Max. operating temperature range	-40 to 125	°C	
T _{stg} Max. storage temperature range	-40 to 150		
R _{thJC} Max. thermal resistance, junction to case	0.195	K/W	DC operation
R _{thCS} Max. thermal resistance, case to heatsink	0.08		Mounting surface, smooth, flat and greased
T Mounting torque, ± 10%	6	Nm	Non lubricated threads
	4	(lbf-in)	Lubricated threads
wt Approximate weight	26	g	

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