Ruttonsha International Rectifier Ltd.

SILICON CONTROLLED RECTIFIERS

High Power Thyristor
Hockey Puk Version
E-PUK Series 600PE

Types : 600 PE 20 to 600 PE 220

600 PE ...

FEATURES

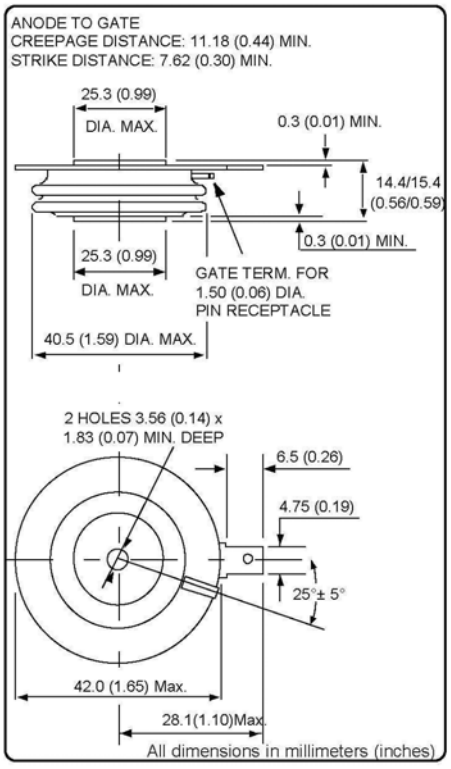
- *Center amplifying gate.*
- *International standard case TO-200AB (E-PUK)*
- *High profile hockey - puk.*

TYPICAL APPLICATIONS

- *DC motor control (e.g. for machine tools).*
- *Controlled rectifiers (e.g. for battery charging, UPS).*
- *AC controllers (e.g. for temperature control, lights control).*

MAJOR RATINGS & CHARACTERISTICS

Parameters		600PE	Units
$I_{T(AV)}$		650	A
	@ T_{hs}	55	^{0}C
$I_{T(RMS)}$		1230	A
	@ T_{hs}	25	^{0}C
I_{TSM}	@ 50 Hz	9000	A
I^2t	@ 50 Hz	405	KA^{2}s
V_{DRM} / V_{RRM}		200 to 2200	V
t_q	typical	100	µs
T_J		-40 to 125	^{0}C



SILICON CONTROLLED RECTIFIERS

600PE

ELECTRICAL SPECIFICATION

VOLTAGE RATINGS

Type Number	Voltage Code	V_{RRM} / V_{DRM}, max. repetitive peak and off-state voltage V	V_{RSM}, max. non-repetitive peak voltage V	I_{DRM} / I_{RRM} max. @ 125°C mA
600PE	20	200	300	50
	40	400	500	
	60	600	700	
	80	800	900	
	100	1000	1100	
	120	1200	1300	
	140	1400	1500	
	160	1600	1700	
	180	1800	1900	
	200	2000	2100	
	220	2200	2300	

ON-STATE CONDUCTION

	Parameter	600PE	Units	Conditions	
$I_{T(AV)}$	Max. average on-state current	650	A	180° conduction, half sine wave	
	@ heat sink temperature	55	°C	double side cooled	
$I_{T(RMS)}$	Max. RMS on-state current	1230	A	@25°C heat sink temperature (double side cooled)	
I_{TSM}	Max. peak one cycle non-repetitive surge current	9000		t = 10ms	Sinusodial half Wave Initial T_J = T_J max.
I^2t	Maximum I^2t for fusing	405	kA^2s	t = 10ms	
$V_{T(TO)}$	Threshold voltage	0.91	V	T_J = T_J max.	
r_t	On state slope resistance	0.57	mΩ	T_J = T_J max.	
V_{TM}	Max. on state voltage	1.90	V	I_{pk} =1730A, T_J = 125°C, t_p = 10ms sine pulse	
I_H	Maximum holding current	600	mA	T_J = 25°C, anode supply 12V resistive load	
I_L	Latching current	1000			

SWITCHING

	Parameter	600PE	Units	Conditions
di/dt	Max. non-repetitive rate of rise of turned-on current	100	A/µs	Gate drive 20V, 20Ω, tr ≤ 1 µs T_J = 125°C, anode voltage ≤ 80% V_{DRM}
t_d	Typical delay time	1.0	µs	Gate current 1A, di_g/dt = 1A/µs V_d = 0.67% V_{DRM}, T_J = 25°C
t_q	Typical turn-off time	100		I_{TM} = 550A, T_J = 125°C, di/dt = 40A/µs, V_R = 50V dv/dt = 20V/µs, Gate 0V 100Ω, t_p = 500µs

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BLOCKING

	Parameter	600PE	Units	Conditions
dv/dt	Maximum critical rate of rise of off-state voltage	500	V/µs	T_J = 125°C, linear to 80% rated V_{DRM}
I_{RRM} I_{DRM}	Max. peak reverse and off-state leakage current	50	mA	T_J = 125°C, rated V_{DRM} /V_{RRM} applied

TRIGGERING

	Parameter	600PE		Units	Conditions	
P_{GM}	Maximum peak gate power	10.0		W	T_J = 125°C, $t_p \leq$ 5ms	
$P_{G(AV)}$	Maximum average gate power	2.0			T_J = 125°C, f= 50Hz, d% = 50	
I_{GM}	Max. peak positive gate current	3.0		A	T_J = 125°C, $t_p \leq$ 5ms	
$+V_{GM}$	Max. peak positive gate voltage	20		V	T_J = 125°C, $t_p \leq$ 5ms	
$-V_{GM}$	Max. peak negative gate voltage	5.0				
I_{GT}	DC gate current required to trigger	TYP. 100	MAX. 200	mA	T_J = 25°C	Max. required gate trigger/current / voltage are the lowest value which will trigger all units 12V anode-to-cathode applied.
V_{GT}	DC gate voltage required to trigger	1.8	3.0	V	T_J = 25°C	
I_{GD}	DC gate current not to trigger	10		mA	T_J = 125°C	Max. gate current / voltage not to trigger is the max. value which will not trigger any unit with rated V_{DRM} anode-to-cathode applied.
V_{GD}	DC gate voltage not to trigger	0.25		V		

THERMAL AND MECHANICAL SPECIFICATION

	Parameter	600PE	Units	Conditions
T_J	Max. operating temperature range	-40 to 125	°C	
T_{stg}	Max. storage temperature range	-40 to 150		
R_{thJ-hs}	Max. thermal resistance, junction to heat sink	0.05	K/W	DC operation double side cooled
F	Mounting force, ±10%	9800	N	
wt	Approximate weight	83	g	
	Case style	To - 200AB		See outline