Ruttonsha International Rectifier Ltd.

SILICON CONTROL RECTIFIER

High Power Thyristor
Hockey Puk Version
Q/R-PUK Series
Type:- 3800 PQ/PR 180

FEATURES

 # Center amplifying gate.
 # Metal case with ceramic insulator.
 # High profile hokey - puk.

TYPICAL APPLICATION

 # DC Motor control (e.g. for machine tools).
 # Controlled rectifiers (e.g. for battery charging Uninterrupted power supply).
 # AC Controllers (e.g. for temperature control lights control).

MAJOR RATING & CHARACTERISTICS

Parameters		3800 PQ/PR	Units
$I_{T(AV)}$	@ 55°C	3810	A
$I_{T(RMS)}$		5980	A
I_{TSM}	@ 50Hz	50	KA
I^2t	@ 50Hz	12500	KA^2S
V_{DRM} -V_{RRM}		1400 to 1800	V
T_q		400	µs
T_J		-40 to 125	°C

3800 PQ/PR SERIES

ELECTRICAL SPECIFICATION

VOLTAGE RATINGS

Type Number	Voltage Code	V_{RMM} / V_{DRM} max. repetitive peak reverse voltage V	V_{RSM} max.Non-repetitive peak reverse voltage V	I_{DRM} / I_{RRM} max. @ 125°C Max. mA
3800 PQ/PR	140	1400	1500	150
	160	1600	1700	
	180	1800	1900	

ON-STATE CONDUCTION

	Parameter	3800PQ/PR	Unit	Conditions	
$I_{T(AV)}$	Max, average on-state current @ Case temperature	3810	A	180° conduction, half sine wave	
		55	°C		
$I_{T(RMS)}$	Max, RMS on-state current	5980	A	as AC switch	
I_{TSM}	Max, peak, one cycle on-state, non-repetitive surge current	50	KA	t = 10ms	Sinusoidal half wave, Initial Tj = Tj max.
I^2t	Maximum I^2t for fusing	12500	KA^2s	t = 10ms	Sinusoidal half wave, Initial Tj = Tj max.
$V_{T(TO)}$	Threshould voltage	0.87	V	Tj = Tj max.	
r_t	On-state slope resistance	0.085	mΩ	Tj = Tj max,	
V_{TM}	Max, on-state voltage drop	1.16	V	I_T = 3000Amps, 125°C	
I_H	Holding current	200	mA	Anod supply = 12V, initial I_T = 30µs, Tj = 25°C	
I_L	Latching current	1	A	Anod supply = 12V, resistive load =1Ω, gate pulse : 10V, 100µs, Tj = 25°C	

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BLOCKING & SWITCHING

	Parameter	3800 PQ/PR		Conditions
dv/dt	Maximum critical rate of rise off-state voltage	1000	V/µs	Tj = Tj Max, lienear to 80% rated V_{DRM}
I_{RRM} I_{DRM}	Max. peak reverse and off-state leakage current	150	mA	Tj = Tj Max, rated V_{DRM}/V_{RRM} applied
di/dt	Max. non-repatitive rate rise of turned-on current	150	A/µs	Gate drive 20V, 20Ω, t_r < 1µs Tj = Tjmax, anode voltage < 80% V_{DRM}
tq	Typical turn-off time	400	µs	I_{TM} 1000A, Tj = Tj max, di/dt = 40A/µs V_R = 75V dv/dt = 50V/µs 0.5 V_{DRM} Reapplied, t_q = 500µs

TRIGGERING

	Parameter	3800 PQ/PR	Unit	Conditions
P_{GM}	Max, peak gate power	30	W	Tj = 125°C, tp = 100 µs
$P_{G(AV)}$	Maximum average gate power	5		Tj = 125°C, f = 50Hz, d% = 50
I_{GM}	Max, peak positive gate current	3.0	A	Tj = 125° C, tp ≤ 5ms
$+V_{GM}$	Max. peak positive gate voltage	20.0	V	Tj = 125°C tq ≤ 5ms
$-V_{GM}$	Max. peak negative gate voltage	5.0		
I_{GT}	DC gate current required to trigger	200	mA	Tj = 25°C
V_{GT}	DC gate voltage for to trigger	3	V	Tj = 25°C Max, required gate trigger current/ voltage are the lowest value which will trigger all units 12V anode-to-cathode applied
I_{GD}	DC gate current not to trigger	10	mA	Tj = Tj max. Max, gate current/ voltage not to trigger is the max. value witch 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	3800 PQ/PR	Unit	Conditions
T_J	Max, operating temperature range	-40 to 125	°C	
T_{stg}	Max, storage temperature range	-40 to 150		
R_{thJ-C}	Max, thermal resistance, junction to Case	0.011	K/W	Per junction , Double side cooled.
F	Mounting force ±10%	40	kN	
W t	Approximate Weight	1000/ 1700	g	
	Case style	Q/R-PUK		See outline

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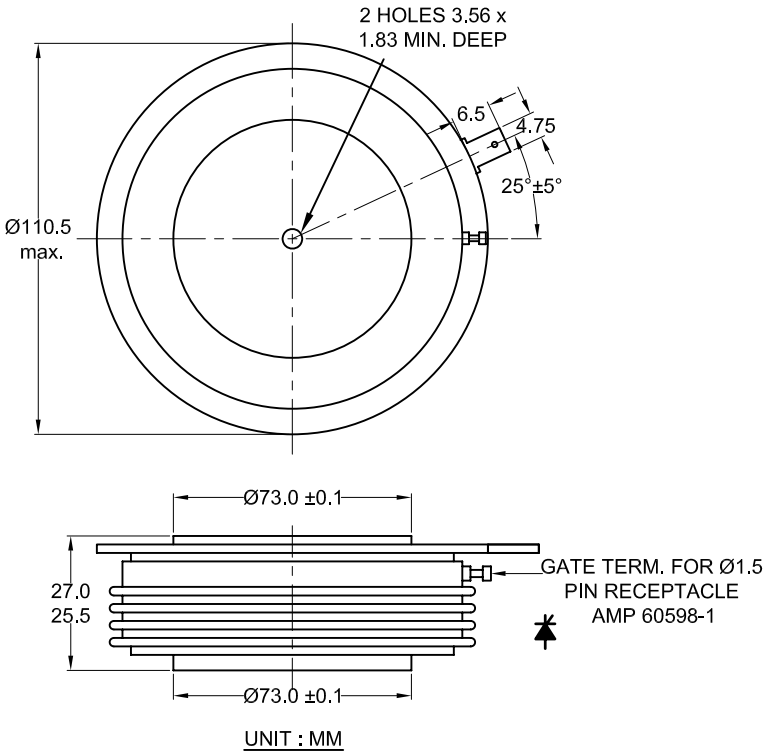
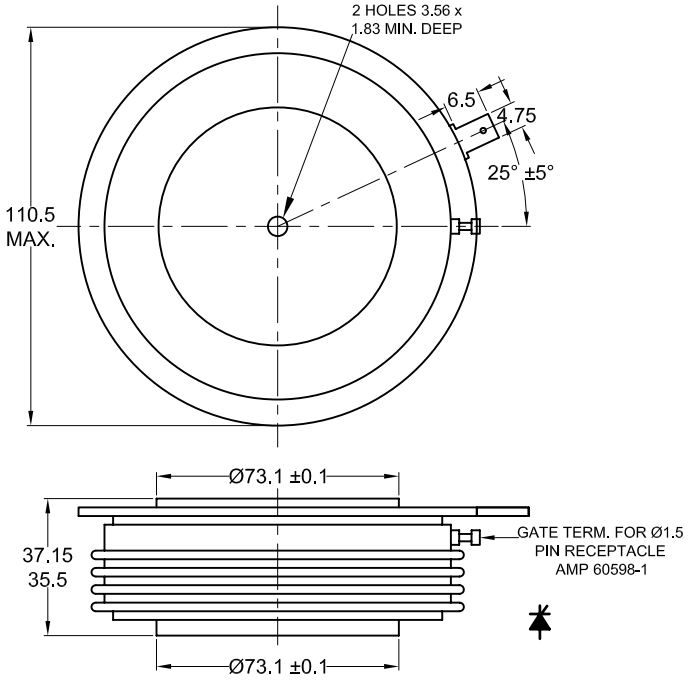
OUTLINE DIAGRAM

Q-PUK



UNIT : MM

R-PUK



UNIT : MM