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BTW63 SERIES

FAST TURN-OFF THYRISTORS

Glass-passivated, asymmetrical, fast turn-off, forward blocking thyristors (ASCR) in TO-48 envelopes, suitable for operation in fast power inverters. For reverse-blocking operation use with a series diode, for reverse-conducting operation use with an anti-parallel diode.

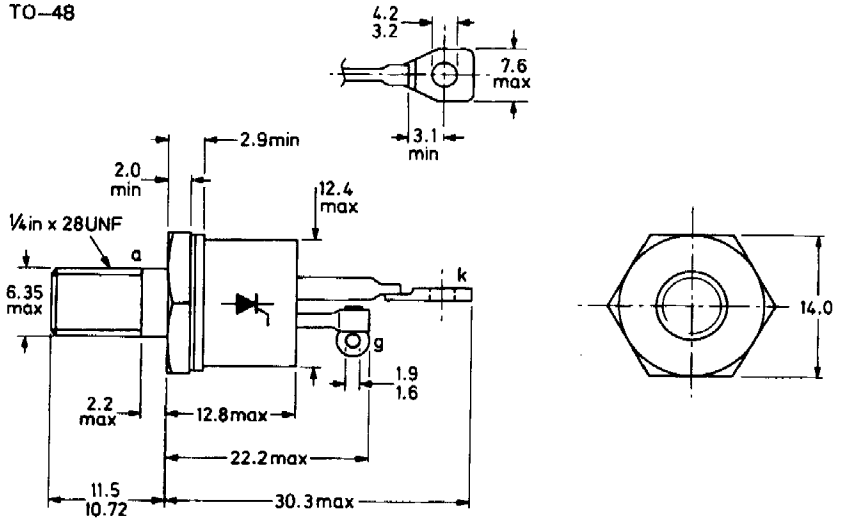
QUICK REFERENCE DATA

			BTW63–600R	800R	1000R	
Repetitive peak off-state voltage	V_{DRM}	max.	600	800	1000	V
Average on-state current	$I_{T(AV)}$	max.		25		A
Repetitive peak on-state current	I_{TRM}	max.		250		A
Circuit-commutated turn-off time						
suffix K	t_q	<		4		μs
suffix N	t_q	<		6		μs
suffix P	t_q	<		8		μs

MECHANICAL DATA

Dimensions in mm

Fig.1 TO–48



Net mass: 14 g
Diameter of clearance hole: max. 6.5 mm
Accessories supplied on request

Supplied with device: 1 nut, 1 lock washer.
Torque on nut: min. 1.7 Nm (17 kg cm)
max. 3.5 Nm (35 kg cm)
Nut dimensions across the flats: 11.1 mm

RATINGS

Limiting values in accordance with the Absolute Maximum System (IEC134)

			BTW63–	600R	800R	1000R	
Anode to cathode							
Transient off-state voltage	V_{DSM}	max.		800	1000	1000	V
Repetitive peak off-state voltage	V_{DRM}	max.		600	800	1000	V
Continuous off-state voltage	V_D	max.		500	650	700	V
Transient reverse voltage ($t_p \leq 5\ \mu s$)	V_{RSM}	max.				15	V
Average on-state current (averaged over any 20 ms period)							
up to $T_{mb} = 75\ ^oC$	$I_{T(AV)}$	max.				25	A
at $T_{mb} = 85\ ^oC$	$I_{T(AV)}$	max.				22	A
R.M.S. on-state current	$I_{T(RMS)}$	max.				40	A
Repetitive peak on-state current; $t_p = 50\ \mu s$; $\delta = 0.05$	I_{TRM}	max.				250	A
Non-repetitive peak on-state current $T_j = 125\ ^oC$ prior to surge; $t = 10$ ms; half sine-wave	I_{TSM}	max.				370	A
I^2t for fusing; $t = 10$ ms	I^2t	max.				700	A^2s
Rate of rise of on-state current after triggering with $I_G = 1.25$ A; $I_T = 80$ A	dI_T/dt	max.				1000	$A/\mu s$
Gate to cathode							
Average power dissipation (averaged over any 20 ms period)	$P_{G(AV)}$	max.				1	W
Peak power dissipation; $t = 10\ \mu s$	P_{GM}	max.				10	W
Temperatures							
Storage temperature	T_{stg}				−40 to +125		°C
Operating junction temperature	T_j	max.				125	°C

THERMAL RESISTANCE

From junction to mounting base	$R_{th\ j\text{-}mb}$	=	0.9	K/W
From mounting base to heatsink with heatsink compound	$R_{th\ mb\text{-}h}$	=	0.2	K/W

OPERATING NOTE

The terminals should be neither bent nor twisted; they should be soldered into the circuit so that there is no strain on them.

During soldering the heat conduction to the junction should be kept to a minimum.

CHARACTERISTICS

Anode to cathode

On-state voltage				
I_T = 50 A; T_j = 25 °C	V_T	<	2.6	V*
Off-state current				
$V_D = V_{Dmax}$; T_j = 125 °C	I_D	<	6.0	mA
Holding current; T_j = 25 °C	I_H	<	400	mA

Gate to cathode

Voltage that will trigger all devices				
V_D = 12 V; T_j = 25 °C	V_{GT}	>	2.0	V
Current that will trigger all devices				
V_D = 12 V; T_j = 25 °C	I_{GT}	>	250	mA

Switching characteristics (see Fig.5)

Circuit commutated turn-off time

dV_D/dt = 500 V/μs (linear to V_{DRMmax});
R_{GK} = 10 Ω; V_G = 0; T_j = 125 °C;
when switched from I_T = 100 A; t_p = 150 μs

$-dI_T/dt$ = 50 A/μs				
suffix K	t_q	<	6	μs
suffix N	t_q	<	9	μs
suffix P	t_q	<	12	μs
$-dI_T/dt$ = 10 A/μs				
suffix K	t_q	<	4	μs
suffix N	t_q	<	6	μs
suffix P	t_q	<	8	μs

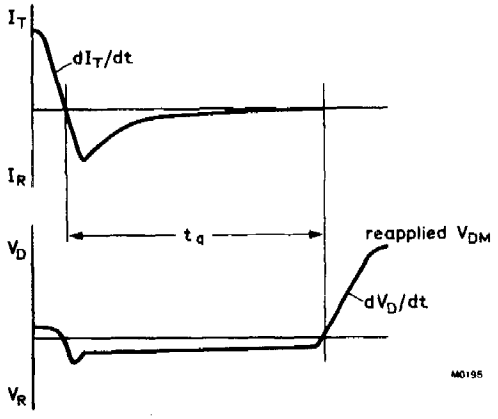


Fig.2 Circuit-commutated turn-off time definition.

*Measured under pulse conditions to avoid excessive dissipation.

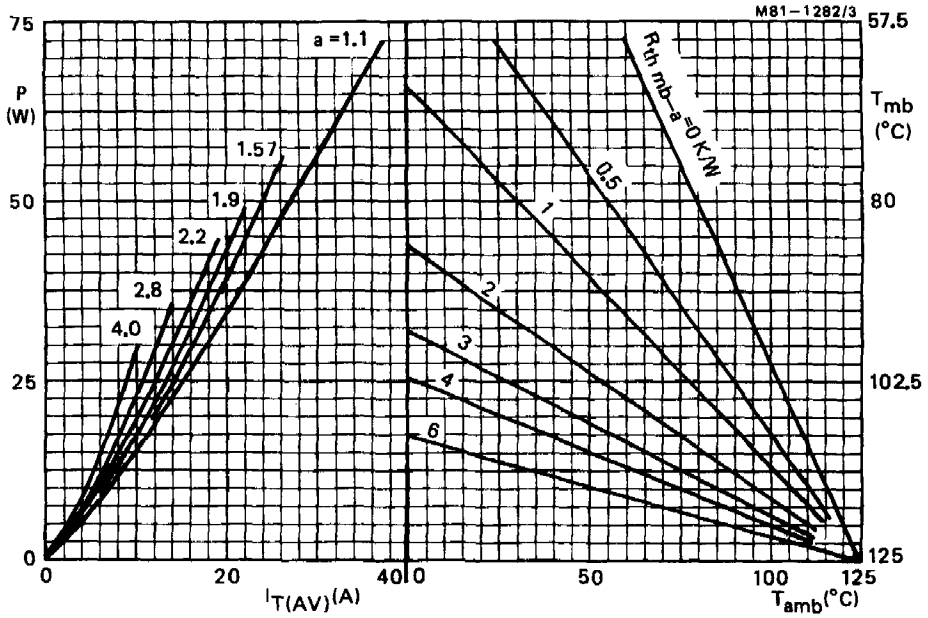


Fig.3 The right-hand part shows the interrelationship between the power (derived from the left-hand part) and the maximum permissible temperatures.

$$a = \text{form factor} = \frac{I_{T(RMS)}}{I_{T(AV)}}$$