New Jersey Semi-Conductor Products, Inc.

20 STERN AVE.
SPRINGFIELD, NEW JERSEY 07081
U.S.A.

TELEPHONE: (973) 376-2922
(212) 227-6005
FAX: (973) 376-8960

BTW42 SERIES

THYRISTORS

Glass-passivated silicon thyristors in metal envelopes with high dV_D/dt capabilities. They are intended for use in power control circuits and switching systems where high transients can occur (e.g. phase control in three-phase systems).
The series consists of reverse polarity types (anode to stud) identified by a suffix R: BTW42–600R to 1000R.

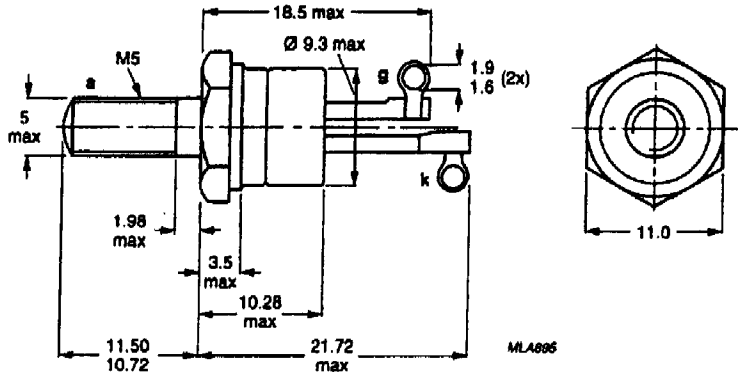
QUICK REFERENCE DATA

		BTW42–	600R	800R	1000R	
Repetitive peak voltages	V_{DRM}/V_{RRM}	max.	600	800	1000	V
Average on-state current	$I_{T(AV)}$	max.		10		A
R.M.S. on-state current	$I_{T(RMS)}$	max.		16		A
Non-repetitive peak on-state current	I_{TSM}	max.		150		A
Rate of rise of off-state voltage that will not trigger any device	dV_D/dt	<		500		V/μs
On request (see Ordering Note)	dV_D/dt	<		1000		V/μs

MECHANICAL DATA

Dimensions in mm

Fig.1 TO–64



Quality Semi-Conductors

RATINGS

Limiting values in accordance with the Absolute Maximum System (IEC 134)

Anode to cathode

		BTW42-600R	800R	1000R	
Non-repetitive peak voltages ($t \leqslant 10$ ms)	V_{DSM}/V_{RSM}	max. 600	800	1000	V
Repetitive peak voltages	V_{DRM}/V_{RRM}	max. 600	800	1000	V
Crest working voltages	V_{DWM}/V_{RWM}	max. 400	600	700	V*

Average on-state current (averaged over any 20 ms period) up to T_{mb} = 85 °C	$I_{T(AV)}$	max.	10	A
R.M.S. on-state current	$I_{T(RMS)}$	max.	16	A
Repetitive peak on-state current	I_{TRM}	max.	75	A
Non-repetitive peak on-state current; t = 10 ms; half sine-wave; T_j = 125 °C prior to surge; with reapplied V_{RWMmax}	I_{TSM}	max.	150	A
I^2t for fusing (t = 10 ms)	I^2t	max.	112	A^2s
Rate of rise of on-state current after triggering with I_G = 250 mA to I_T = 25 A; dI_G/dt = 0,25 A/μs	dI_T/dt	max.	50	A/μs

Gate to cathode

Average power dissipation (averaged over any 20 ms period)	$P_{G(AV)}$	max.	0,5	W
Peak power dissipation	P_{GM}	max.	5	W

Temperatures

Storage temperature	T_{stg}	−55 to +	125	°C
Junction temperature	T_j	max.	125	°C

THERMAL RESISTANCE

From junction to mounting base	$R_{th\ j\text{-}mb}$	=	1,8	K/W
From mounting base to heatsink with heatsink compound	$R_{th\ mb\text{-}h}$	=	0,5	K/W
From junction to ambient in free air	$R_{th\ j\text{-}a}$	=	45	K/W
Transient thermal impedance (t = 1 ms)	$Z_{th\ j\text{-}mb}$	=	0,1	K/W

OPERATING NOTE

The terminals should neither be 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 (measured under pulse conditions) I_T = 20 A; T_j = 25 °C	V_T	<	2	V
Rate of rise of off-state voltage that will not trigger any device; expontential method; V_D = 2/3 V_{DRMmax}; T_j = 125 °C	dV_D/dt	<	500	V/μs
Reverse current V_R = V_{RWMmax}; T_j = 125 °C	I_R	<	3	mA
Off-state current V_D = V_{DWMmax}; T_j = 125 °C	I_D	<	3	mA
Latching current; T_j = 25 °C	I_L	<	150	mA
Holding current; T_j = 25 °C	I_H	<	75	mA

Gate to cathode

Voltage that will trigger all devices V_D = 6 V; T_j = 25 °C	V_{GT}	>	1.5	V
Voltage that will not trigger any device V_D = V_{DRMmax}; T_j = 125 °C	V_{GD}	<	200	mV
Current that will trigger all devices V_D = 6 V; T_j = 25 °C	I_{GT}	>	50	mA

Switching characteristics

Gate-controlled turn-on time (t_{gt} = t_d + t_r) when switched from V_D = V_{DRMmax} to I_T = 40 A; I_{GT} = 100 mA; dI_G/dt = 5 A/μs; T_j = 25 °C	t_{gt}	typ.	2	μs
Circuit-commutated turn-off time when switched from I_T = 40 A to V_R > 50 V with $-dI_T/dt$ = 10A/μs; dV_D/dt = 50 V/μs; T_j = 115 °C	t_q	typ.	35	μs