PNPN Thyristor Tetrode **BRY 20**

25C 04763 D T-25-11

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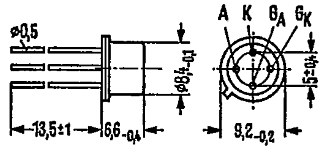
BRY 20 is an extinguishable PNPN silicon planar thyristortetrode in TO 12 case (5 C 4 DIN 41 873). The anode gate (G_A) is electrically connected to the case. The BRY 20 is particularly suitable for use as a medium fast switch.

Type	Ordering code
BRY 20	Q60217-Y20



Approx. weight 1 g   Dimensions in mm

Maximum ratings

Anode gate reverse voltage	V_{GAR}	40	V
Continuous reverse voltage	$-V_R$	40	V
Gate to cathode reverse voltage	V_{GKR}	5	V
Rated surge forward current, see diagram $I_{FRM} = f(t)$	I_{FSM}	5	A
Continuous forward current	I_F	500	mA
Gate to cathode control current	I_{GK}	100	mA
Anode to gate control current	I_{GA}	300	mA
Junction temperature range	T_j	−55 to +125	°C
Storage temperature range	T_{stg}	−55 to +200	°C
Total power dissipation ($T_{case} \leq 45$ °C)	P_{tot}	1.3	W

Thermal resistance

Junction to ambient air	R_{thJA}	≤ 220	K/W
Junction to case	R_{thJC}	≤ 60	K/W

Static characteristics (T_{amb} = 25 °C)

Off-state current			
(V_D = 40 V; R_{GK} = 5 kΩ; I_{GA} = 0)	I_D	3 (< 200)	nA
(V_D = 30 V; R_{GK} = 5 kΩ; I_{GA} = 0)	I_D	2 (< 200)	nA
Reverse current			
(V_R = 40 V; R_{GK} = 5 kΩ; I_{GA} = 0)	I_R	< 200	nA
(V_R = 40 V; R_{GK} = 5 kΩ; T_{amb} = 125 °C)	I_R	< 25	µA
Cathode-gate reverse current			
(V_{GK} = 5 V; I_{AK} = 0)	$-I_{GKR}$	< 10	µA
Anode-gate reverse current			
V_{GA} = 40 V	I_{GAR}	< 200	nA
Forward voltage			
(I_F = 100 mA; R_{GK} = 5 kΩ; I_{GA} = 0)	V_F	< 1.3	V
Breakover voltage (−55 to +125 °C)			
(R_{GK} = 5 kΩ; I_{GA} = 0)	$V_{(BO)}$	< 40	V
Holding current (R_{GK} = 5 kΩ)	I_H	2 (0.3 to 6.5)	mA[1]

1) Closer tolerance available on request

2140 F-07

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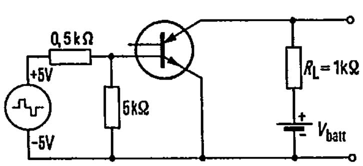
Operating point: V_{batt} = 15 V; R_L = 1 kΩ; I_{GA} = 0			
Gate trigger current	I_{GKT}	50 (<100)	µA
Turn-off current	I_{GKQ}	2.5 (<5)	mA
Gate trigger voltage	V_{GKT}	0.4 (to 0.8)	V
Operating point: V_{batt} = 15 V; R_L = 500 Ω; $G_A I_G$ = 0			
Gate trigger current	I_{GKT}	50 (<100)	µA
Turn-off current	I_{GKQ}	10 (<15)	mA
Operating point: V_{batt} = 15 V; R_L = 0.5 kΩ; R_{GK} = 5 kΩ			
Anode gate trigger current	I_{GAT}	<3	mA
Anode gate trigger voltage	V_{GAT}	0.4 to 0.8	V

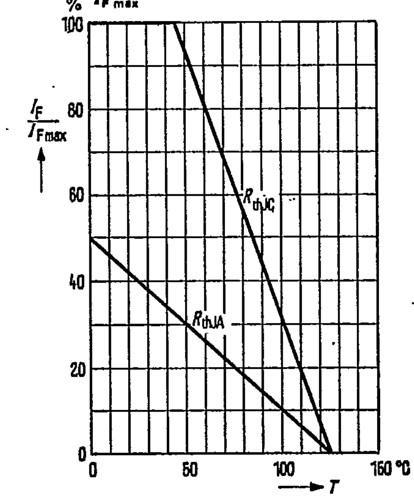
Dynamic characteristics

Operating point: V_{batt} = 15 V; R_L = 1 kΩ; R_{GK} = 5 kΩ; I_{GKT} = I_{GKQ} = 5 mA			
Gate controlled turn-on time	t_g	100 (<300)	ns
Gate controlled turn-off time	t_{gq}	<5	µs
Junction capacitance (V_{AK} = 20 V)	C_{AK}	3.5	pF
Turn-off time (V_{AA} = 15 V; R_L = 1 kΩ; R_{AK} = 5 kΩ)	t_q	7	µs
Critical rate of voltage rise[1] (V_{AA} = 40 V; R_{GK} = 100 kΩ)	du/dt	>5	V/µs

Test circuit for switching times

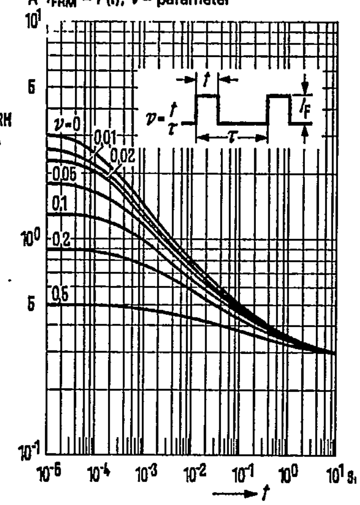


Max. permissible anode current
$\frac{I_F}{I_{F\,max}} = f(T); R_{th}$ = parameter

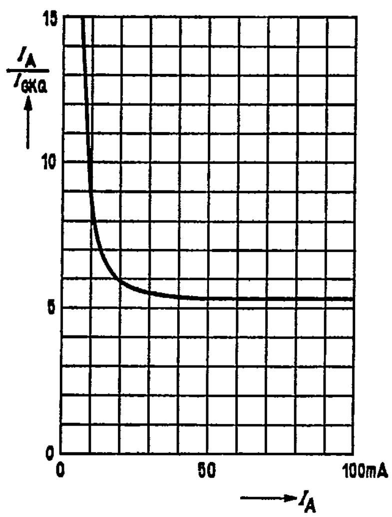


1) If the anode gate is connected to the anode supply voltage via a 220 kΩ resistor, the permissible voltage rise at the anode is unlimited.

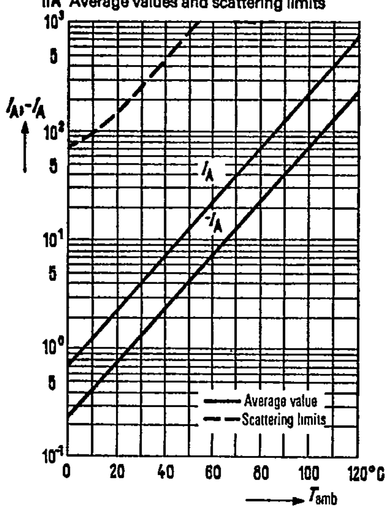
Permissible anode current versus pulse width and duty cycle
$I_{FRM} = f(t)$; v = parameter



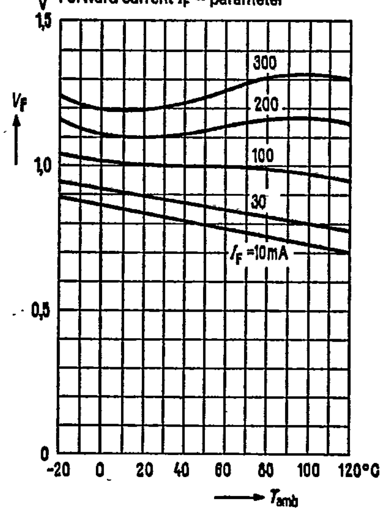
Switching ratio $I_A/I_{GKQ} = f(I_A)$



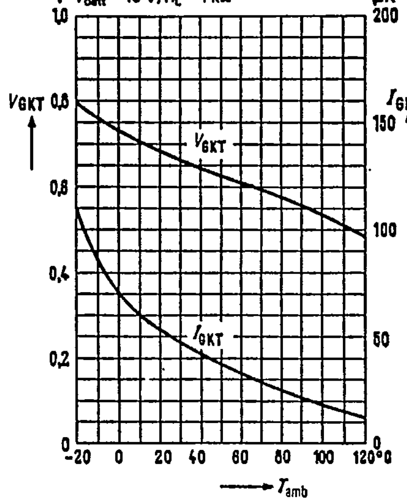
Anode current $I_A = f(T_{amb})$
Average values and scattering limits



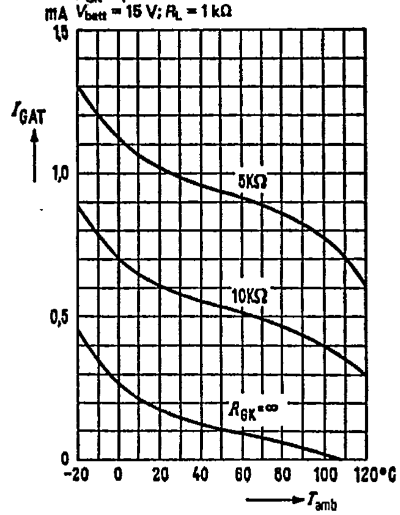
Forward voltage $V_F = f(T_{amb})$
Forward current I_F = parameter



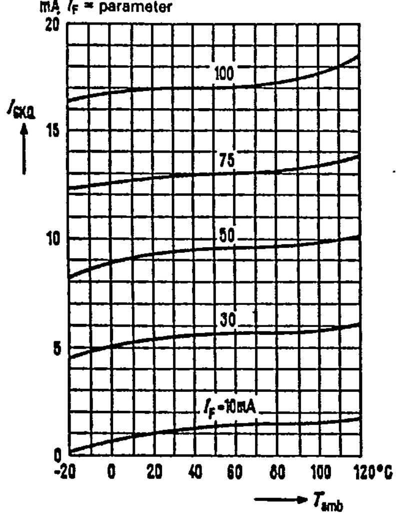
Trigger current $I_{GKT} = f(T_{amb})$
Trigger voltage $V_{GKT} = f(T_{amb})$
V V_{batt} = 15 V; R_L = 1 kΩ µA



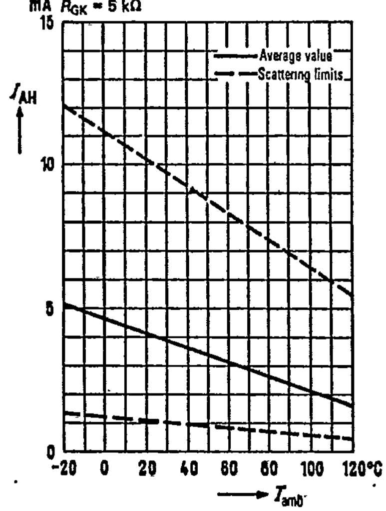
Anode control current $I_{GAT} = f(T_{amb})$
R_{GK} = parameter
mA V_{batt} = 15 V; R_L = 1 kΩ



Turn-off current $I_{GKQ} = f(T_{amb})$
mA I_F = parameter



Holding current $I_{AH} = f(T_{amb})$
Average values scattering limits
mA R_{GK} = 5 kΩ



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