

PNPN Thyristor Tetrode

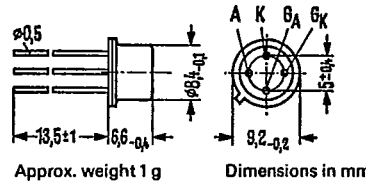
BRY 20

25C 04763 D T-25-11

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BRY 20 is an extinguishable PNP 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



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_{FRM}	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 ($T_{case} \leq 45^\circ C$)	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 ($T_{amb} = 25^\circ C$)

Off-state current			
($V_D = 40 V; R_{GK} = 5 k\Omega; I_{GA} = 0$)	I_D	3 (< 200)	nA
($V_D = 30 V; R_{GK} = 5 k\Omega; I_{GA} = 0$)	I_D	2 (< 200)	nA
Reverse current			
($V_R = 40 V; R_{GK} = 5 k\Omega; I_{GA} = 0$)	I_R	< 200	nA
($V_R = 40 V; R_{GK} = 5 k\Omega; T_{amb} = 125^\circ C$)	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			
($I_F = 100 mA; R_{GK} = 5 k\Omega; I_{GA} = 0$)	V_F	< 1.3	V
Breakover voltage (-55 to +125°C)			
($R_{GK} = 5 k\Omega; I_{GA} = 0$)	$V_{(BO)}$	< 40	V
Holding current ($R_{GK} = 5 k\Omega$)	I_H	2 (0.3 to 6.5)	mA ¹⁾

1) Closer tolerance available on request

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Operating point: $V_{batt} = 15\text{ V}$; $R_L = 1\text{ k}\Omega$; $I_{GA} = 0$

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: $V_{batt} = 15\text{ V}$; $R_L = 500\ \Omega$; $G_A I_G = 0$

Gate trigger current	I_{GKT}	50 (<100)	μA
Turn-off current	I_{GKQ}	10 (<15)	mA

Operating point: $V_{batt} = 15\text{ V}$; $R_L = 0.5\text{ k}\Omega$; $R_{GK} = 5\text{ k}\Omega$

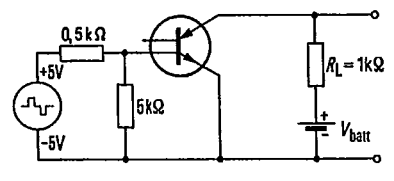
Anode gate trigger current	I_{GAT}	<3	mA
Anode gate trigger voltage	V_{GAT}	0.4 to 0.8	V

Dynamic characteristics

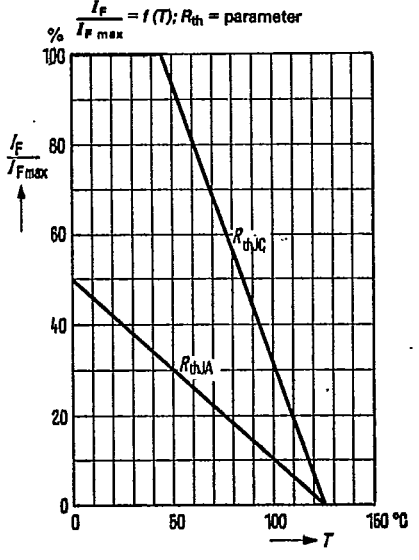
Operating point: $V_{batt} = 15\text{ V}$; $R_L = 1\text{ k}\Omega$; $R_{GK} = 5\text{ k}\Omega$; $I_{GKT} = I_{GKQ} = 5\text{ mA}$

Gate controlled turn-on time	t_g	100 (<300)	ns
Gate controlled turn-off time	t_{gq}	<5	μs
Junction capacitance ($V_{AK} = 20\text{ V}$)	C_{AK}	3.5	pF
Turn-off time ($V_{AA} = 15\text{ V}$; $R_L = 1\text{ k}\Omega$; $R_{AK} = 5\text{ k}\Omega$)	t_q	7	μs
Critical rate of voltage rise ¹⁾ ($V_{AA} = 40\text{ V}$; $R_{GK} = 100\text{ k}\Omega$)	du/dt	>5	V/ μs

Test circuit for switching times



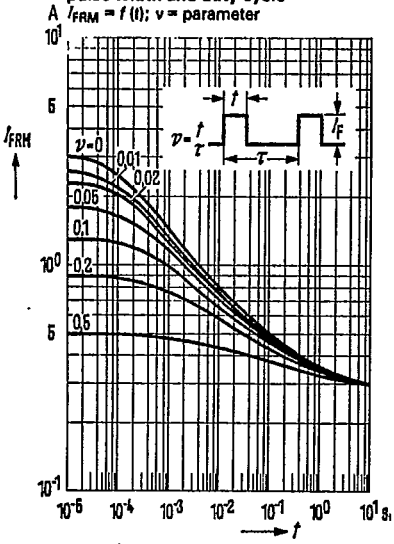
Max. permissible anode current



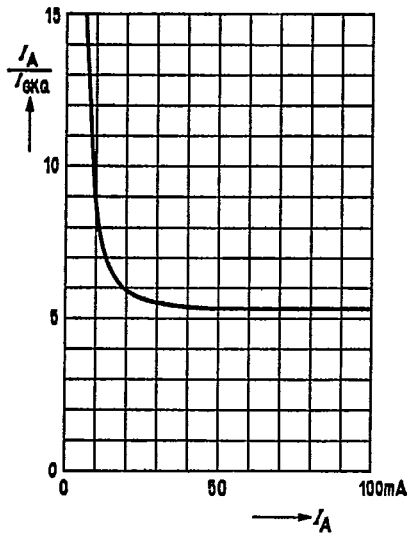
1) If the anode gate is connected to the anode supply voltage via a 220 kΩ resistor, the permissible voltage rise at the anode is unlimited.

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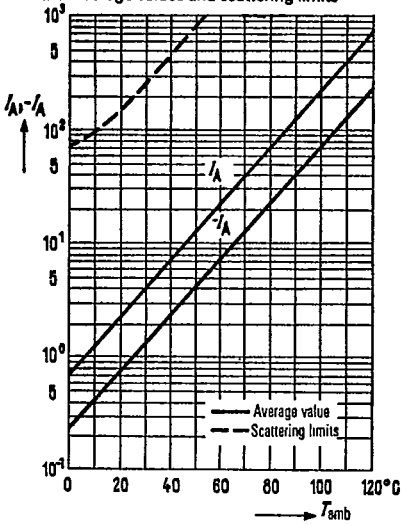
Permissible anode current versus pulse width and duty cycle



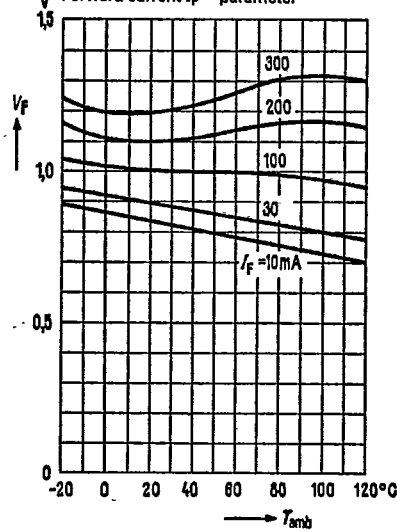
Switching ratio $I_A/I_{GKQ} = f(I_A)$



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



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



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