

TOSHIBA PROGRAMMABLE UNI JUNCTION TRANSISTOR SILICON PLANAR TYPE

TN41A, TN41B

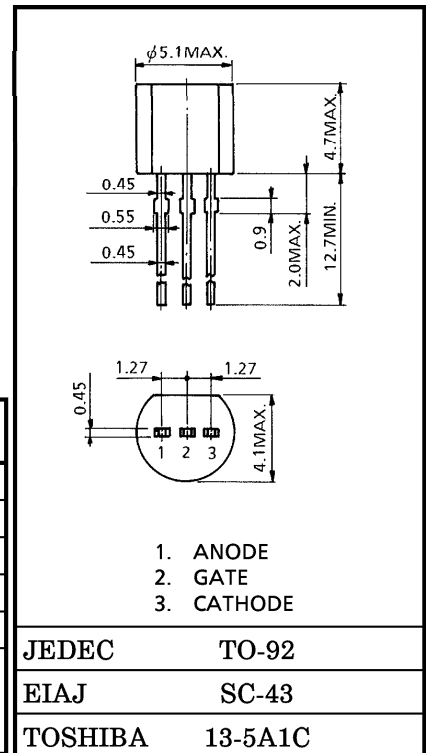
THYRISTOR-TRIGGER, RELAXATION OSCILLATOR, PULSER AND TIMER APPLICATIONS

Unit in mm

- Low Leakage Current : $I_{GAO} = 10\text{nA}$ (Max.)
 $I_{GKS} = 100\text{nA}$ (Max.)
- High Pulse Output Voltage : $V_O = 10\text{V}$ (Typ.)
- Low Peak Current : $I_P = 2\mu\text{A}$ (Max.) TN41A ($R_G = 1\text{M}\Omega$)
 $I_P = 0.15\mu\text{A}$ (Max.) TN41B ($R_G = 1\text{M}\Omega$)

MAXIMUM RATINGS

CHARACTERISTIC	SYMBOL	RATING	UNIT
Gate-Cathode Forward Voltage	V_{GKF}	40	V
Gate-Cathode Reverse Voltage	V_{GKR}	-5	V
Gate-Anode Reverse Voltage	V_{GAR}	40	V
Anode-Cathode Voltage	V_{AK}	± 40	V
DC Anode Current (Note 1)	I_T	150	mA
Repetitive Peak Forward Current (1% Duty Cycle)	I_{TM}	$t_w = 100\mu\text{s}$	1
		$t_w = 10\mu\text{s}$	2
Non-Repetitive Peak Forward Current ($t_w = 10\mu\text{s}$)	I_{TSM}	5	A
DC Gate Current (Note 1)	I_G	± 20	mA
Capacitive Discharge Energy (Note 2)	E	250	μJ
Power Dissipation (Note 1)	P	300	mW
Operating Temperature	T_{opr}	-50~100	$^{\circ}\text{C}$
Junction Temperature	T_j	-50~125	$^{\circ}\text{C}$
Storage Temperature Range	T_{stg}	-50~125	$^{\circ}\text{C}$



Weight : 0.2g

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ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	FIGURE No. AND CONDITION	TN41A			TN41B			UNIT
				MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	
Peak Current (V _S = 10V)	R _G = 1MΩ	I _P	1, 2, 3	—	0.05	2	—	0.01	0.15	μA
	R _G = 10kΩ			—	1.0	5	—	0.35	1.0	
Offset Voltage (V _S = 10V)	R _G = 1MΩ	V _T	1, 2, 3	0.2	0.35	1.6	0.2	0.35	0.6	V
	R _G = 10kΩ			0.2	0.45	0.6	0.2	0.45	0.6	
Valley Current (V _S = 10V)	R _G = 1MΩ	I _V	1, 2, 3	—	15	50	—	7	25	μA
	R _G = 10kΩ			70	200	—	25	160	—	
Gate-Anode Leakage Current		I _{GAO}	4, V _S = 40V	—	0.03	10	—	0.03	10	nA
Gate-Cathode Leakage Current		I _{GKS}	5, V _S = 40V	—	0.3	100	—	0.3	100	nA
Forward Voltage		V _F	I _F = 50mA	—	1	1.5	—	1	1.5	V
Pulse Output Voltage		V _O	6, 7	6	10	—	6	10	—	V
Pulse Voltage Rise Time		t _r	6, 7	—	70	80	—	70	80	ns

(Note 1) Derate linearly current and powers 1%/°C above 25°C.

(Note 2) E = 0.5 · CV² capacitor discharge energy limiting resistor and repetition.

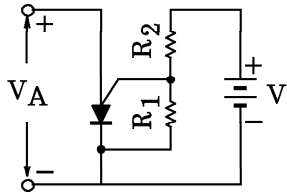


Fig.1 Programmable UJT with program resistor R₁ and R₂

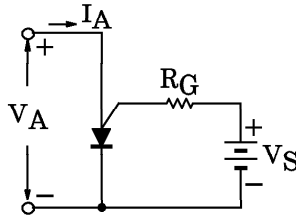


Fig.2 Equivalent test circuit for figure 1 used for electrical characteristic testing

$$R_G = \frac{R_1 \cdot R_2}{R_1 + R_2}$$

$$V_S = \frac{R_1}{R_1 + R_2} V$$

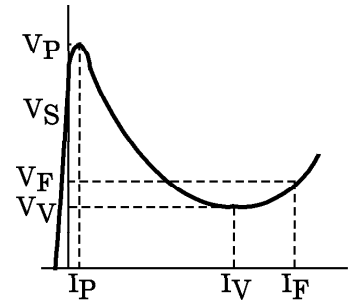


Fig.3 V-I electrical characteristics

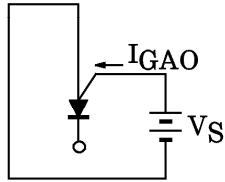


Fig.4 IGAO test circuit

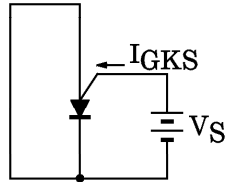


Fig.5 IGKS test circuit

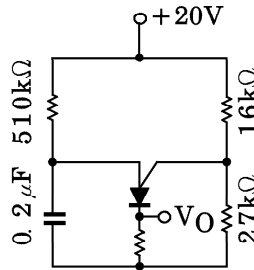


Fig.6 V_O and t_r test circuit

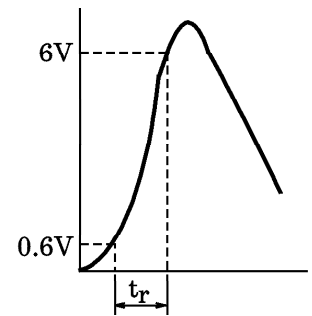


Fig.7 Waveform of V_O and t_r

