NTE239
Silicon Controlled Switch (SCS)

Description:

The NTE239 is a silicon controlled switch in a TO72 type package designed for use as a driver for a numerical indicator tube and switching applications.

Features:

- Selective Breakover Voltage
- Low ON Voltage

Absolute Maximum Ratings: (T_A = +25°C unless otherwise specified)

Collector–Base Voltage (Open Emitter), V_{CBO}
     NPN 70V
     PNP . . . . −70V
Collector–Emitter Voltage (NPN Only, R_{BE} = 10kΩ), V_{CER} 70V
Collector–Emitter Voltage (PNP Only, Open Base), V_{CEO} . . . . −70V
Emitter–Base Voltage (Open Collector), V_{EBO}
     NPN 5V
     PNP . . . . −70V
DC Collector Current (NPN Only), I_C
     Continuous (Note 1) 175mA
     Peak (Note 2) 175mA
Emitter Current, I_E
     NPN . . . . −175mA
     PNP 175mA
Peak Emitter Current (t_p ≤ 10μs, δ = 0.01), I_{EM}
     NPN . . . . −2.5A
     PNP 2.5A
Total Power Dissipation (T_A ≤ +25°C), P_D 275mW
Operating Junction Temperature, T_J . . . . +150°C
Ambient Operating Temperature Range, T_A . . . . −65° to +150°C
Storage Temperature Range, T_{stg} . . . . −65° to +200°C
Thermal Resistance, Junction–to–Ambient, R_{thJA} 450K/W

Note 1. Provided the I_E rating is not exceeded.
Note 2. During switching on, the device can withstand the discharge of a capacitor o a maximum value of 500pF. This capacitor is charged when the transistor is in cut–off condition, with a collector supply voltage of 160V an a serise resistance of 100kΩ.

Electrical Characteristics: (T_A = +25°C unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Inividual NPN Transistor						
Collector Cutoff Current	I_{CER}	V_{CE} = 70V, R_{BE} = 10kΩ	–	–	100	nA
		V_{CE} = 70V, R_{BE} = 10kΩ, T_J = +150°C	–	–	10	μA
Emitter Cutoff Current	I_{EBO}	V_{EB} = 5V, I_C = 0, T_J = +150°C	–	–	10	μA

Electrical Characteristics (Cont'd): (T_A = +25°C unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Inividual NPN Transistor (Cont'd)						
Collector–Emitter Saturation Voltage	$V_{CE(sat)}$	I_C = 10mA, I_B = 1mA	–	–	500	mV
Base–Emitter Saturation Voltage	$V_{BE(sat)}$	I_C = 10mA, I_B = 1mA	–	–	900	mV
DC Current Gain	h_{FE}	V_{CE} = 2V, I_C = 10mA	50	–	–	
Transition Frequency	f_T	V_{CE} = 2V, I_C = 10mA, f = 100MHz	100	–	–	MHz
Collector Capacitance	C_c	V_{CB} = 20V, I_E = I_e = 0	–	–	5	pF
Emitter Capacitance	C_e	V_{EB} = 1V, I_C = I_c = 0	–	–	25	pF
Individual PNP Transistor						
Collector Cutoff Current	I_{CEO}	$-V_{CE}$ = 70V, I_B = 0, T_J = +150°C	–	–	–10	μA
Emitter Cutoff Current	$-I_{EBO}$	$-V_{EB}$ = 70V, I_C = 0, T_J = +150°C	–	–	–10	μA
DC Current Gain	h_{FE}	$-V_{CB}$ = 5V, I_E = 1mA	3	–	15	
Combined Device						
Forward On–State Voltage	V_{AK}	I_A = 50mA, I_{AG} = 0, R_{KG-K} = 10kΩ	–	–	1.4	V
		I_A = 50mA, I_{AG} = 0, R_{KG-K} = 10kΩ, T_J = –55°C	–	–	1.9	V
		I_A = 1mA, I_{AG} = 10mA, R_{KG-K} = 10kΩ	–	–	1.2	V
Holding Current	I_H	V_{BB} = –2V, I_{AG} = 0, R_{KG-K} = 10kΩ	–	–	1.0	mA
Switching Times						
Turn–On Time	t_{on}	V_{KG-K} = –0.5 to 4.5V, R_{KG-K} = 1kΩ	–	–	0.25	μs
		V_{KG-K} = –0.5 to 0.5V, R_{KG-K} = 10kΩ	–	–	1.5	μs
Turn–Off Time	t_{off}	R_{KG-K} = 10kΩ	–	–	15	μs