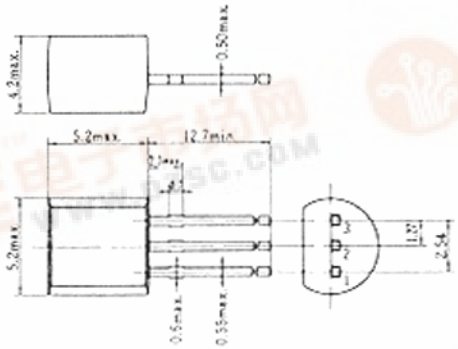
2SC641 (K)

SILICON NPN EPITAXIAL PLANAR

HIGH FREQUENCY AMPLIFIER
HIGH SPEED SWITCHING



1. Emitter
2. Collector
3. Base

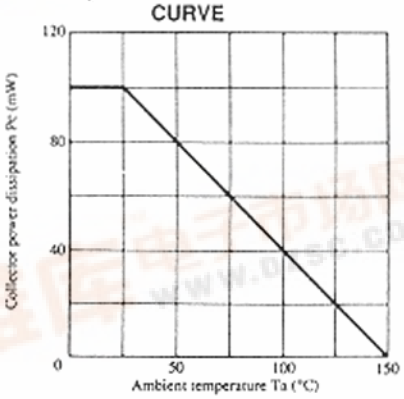
(Dimensions in mm)

(JEDEC TO-92)

■ ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

Item	Symbol	2SC641(K)	Unit
Collector to base voltage	V_{CBO}	40	V
Collector to emitter voltage	V_{CEO}	15	V
Emitter to base voltage	V_{EBO}	5	V
Collector current	I_C	100	mA
Collector power dissipation	P_C	100	mW
Junction temperature	T_j	150	°C
Storage temperature	T_{stg}	−55 to +150	°C

MAXIMUM COLLECTOR DISSIPATION CURVE



■ ELECTRICAL CHARACTERISTICS (Ta=25°C)

Item	Symbol	Test Condition	min.	typ.	max.	Unit
Collector to base breakdown voltage	$V_{(BR)CBO}$	I_C = 10μA, I_E = 0	40	—	—	V
Collector to emitter breakdown voltage	$V_{(BR)CEO}$	I_C = 10mA, R_{BE} = ∞	15	—	—	V
Emitter to base breakdown voltage	$V_{(BR)EBO}$	I_E = 10μA, I_C = 0	5	—	—	V
Collector cutoff current	I_{CBO}	V_{CB} =20V, I_E = 0	—	—	0.25	μA
Emitter cutoff current	I_{EBO}	V_{EB} =4V, I_C = 0	—	—	1.0	μA
DC current transfer ratio	h_{FE}*	V_{CE} = 0.5V, I_C = 1mA	45	—	160	
Collector to emitter saturation voltage	$V_{CE(sat)}$	I_C = 10mA, I_B = 1mA	—	—	0.3	V
Base to emitter saturation voltage	$V_{BE(sat)}$	I_C = 10mA, I_B = 1mA	—	—	0.8	V
Gain bandwidth product	f_T	V_{CE} = 10V, I_C = 10mA	200	400	—	MHz
Collector output capacitance	C_{ob}	V_{CB} = 10V, I_E = 0, f = 1MHz	—	—	6	pF
Turn on time	t_{on}	V_{CC} = 5V	—	20	—	ns
Turn off time	t_{off}	I_C = 5I_{B1} = −10I_{B2} = 100mA	—	35	—	ns
Storage time	t_{stg}	V_{CC} = 5V, I_C = I_{B1} = −I_{B2} = 20mA	—	12	—	ns

* The 2SC641(K) is grouped by h_{FE} as follows.

B	C
45 to 90	80 to 160

HITACHI

2SC641(K)

SWITCHING TIME TEST CIRCUIT
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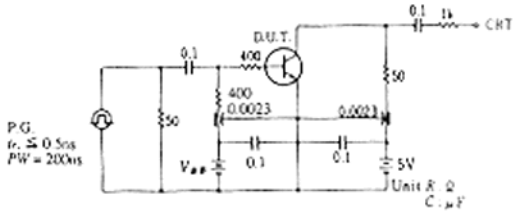
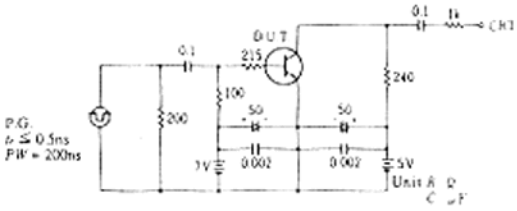
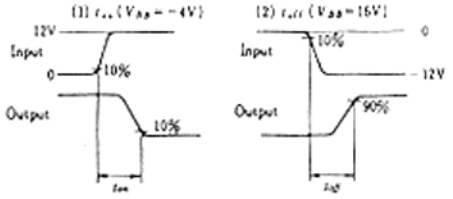


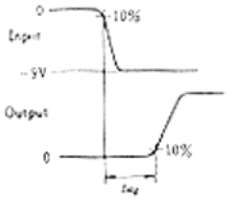
SWITCHING TIME TEST CIRCUIT
tstg TEST CIRCUIT



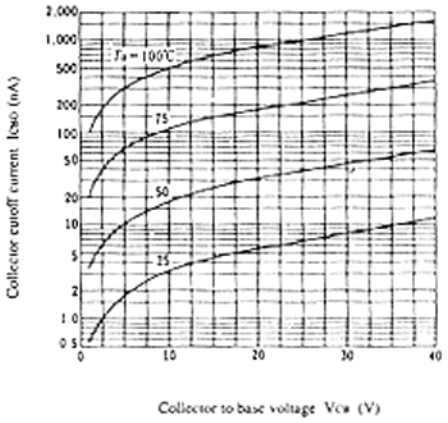
RESPONSE WAVEFORM



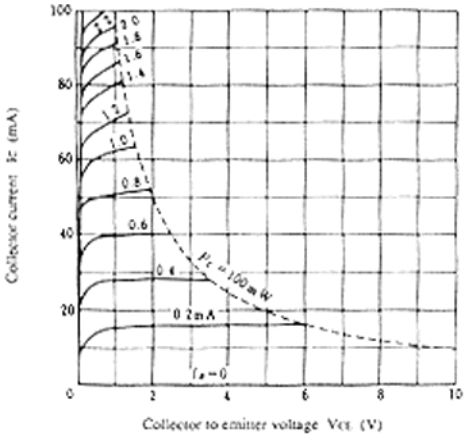
RESPONSE WAVEFORM



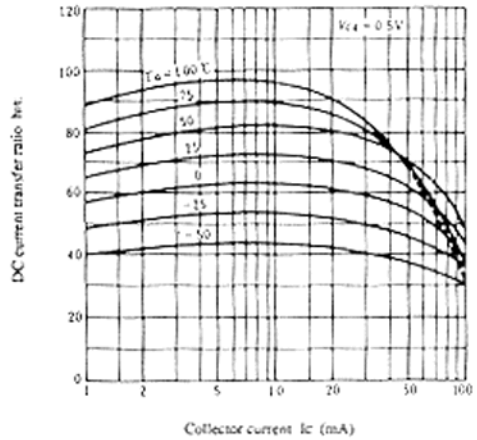
COLLECTOR CUTOFF CURRENT VS. COLLECTOR TO BASE VOLTAGE



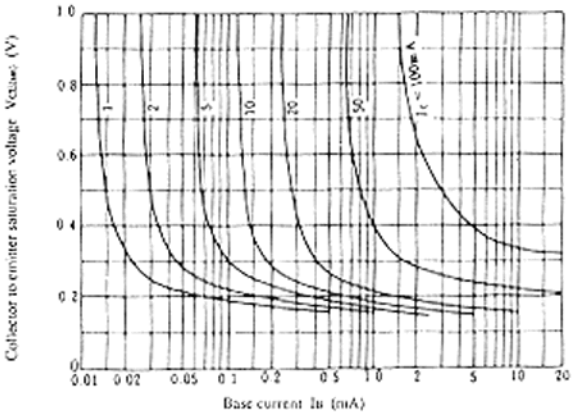
TYPICAL OUTPUT CHARACTERISTICS



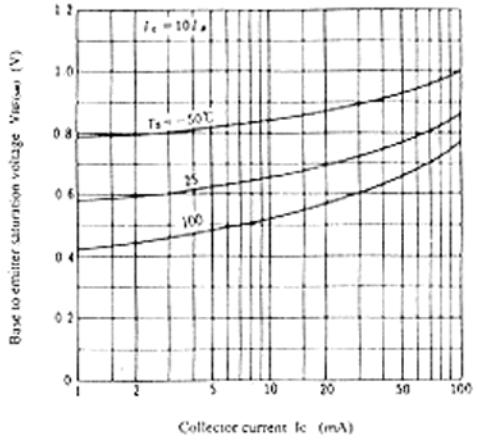
DC CURRENT TRANSFER RATIO VS. COLLECTOR CURRENT



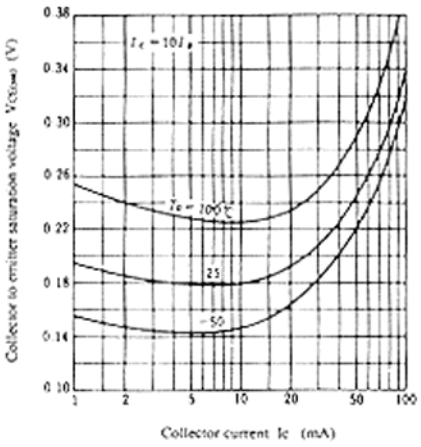
COLLECTOR TO EMITTER SATURATION VOLTAGE VS. BASE CURRENT



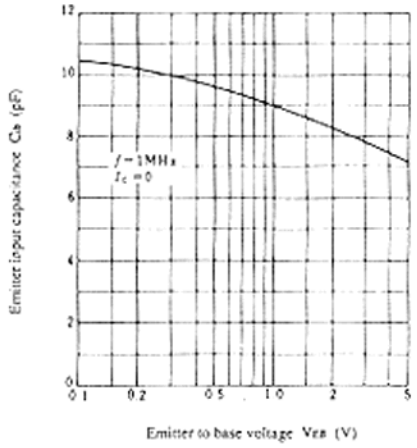
BASE TO EMITTER SATURATION VOLTAGE VS. COLLECTOR CURRENT



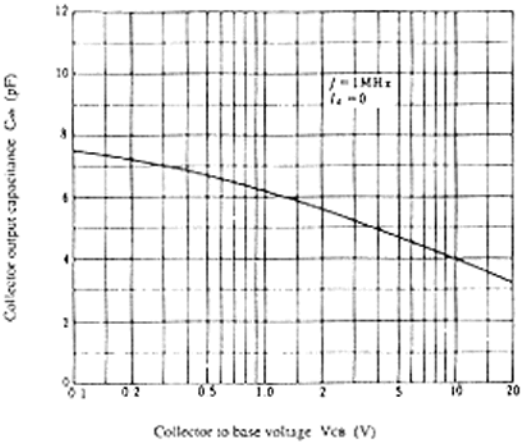
COLLECTOR TO EMITTER SATURATION VOLTAGE VS. COLLECTOR CURRENT



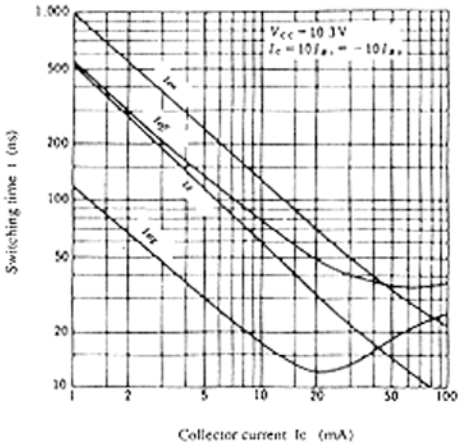
EMITTER INPUT CAPACITANCE VS. EMITTER TO BASE VOLTAGE



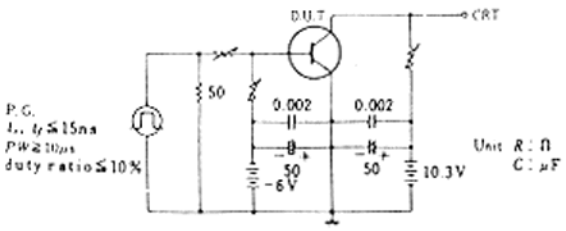
COLLECTOR OUTPUT CAPACITANCE VS. COLLECTOR TO BASE VOLTAGE



SWITCHING TIME VS. COLLECTOR CURRENT



SWITCHING TIME TEST CIRCUIT



RESPONSE WAVEFORM