2SC1472(K)

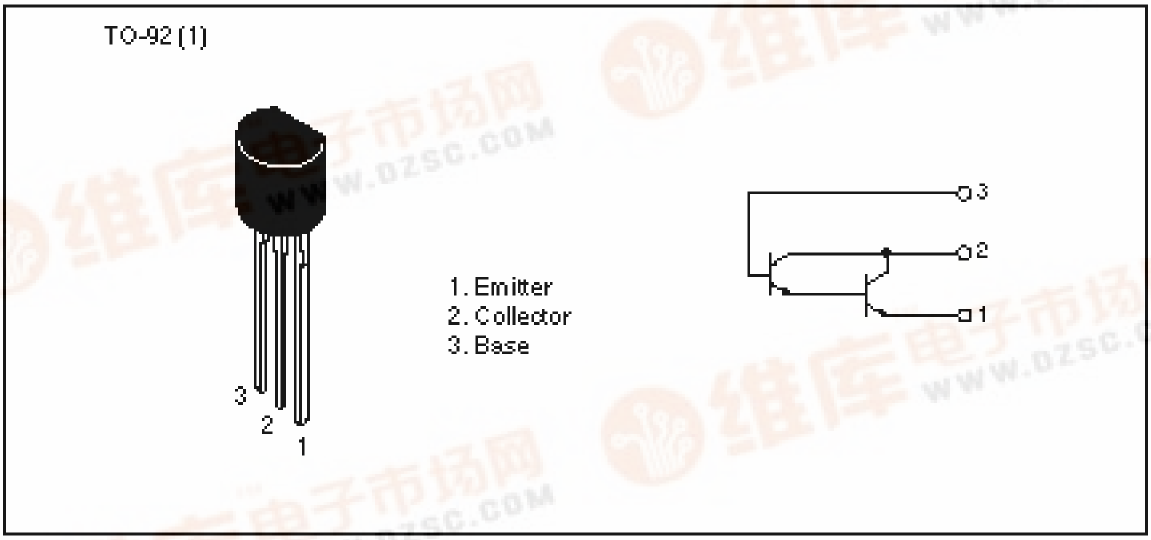
Silicon NPN Epitaxial, Darlington

HITACHI

Application

High gain amplifier

Outline



Absolute Maximum Ratings (Ta = 25°C)

Item	Symbol	Ratings	Unit
Collector to base voltage	V_{CBO}	40	V
Collector to emitter voltage	V_{CEO}	30	V
Emitter to base voltage	V_{EBO}	10	V
Collector current	I_C	300	mA
Collector peak current	$i_{C(peak)}$	500	mA
Collector power dissipation	P_C	500	mW
Junction temperature	Tj	150	°C
Storage temperature	Tstg	–55 to +150	°C

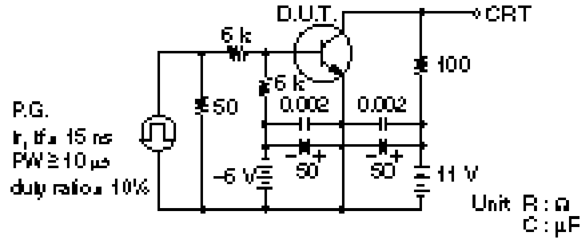
Electrical Characteristics (Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test conditions
Collector to emitter breakdown voltage	$V_{(BR)CEO}$	30	—	—	V	$I_C = 1$ mA, $R_{BE} = \infty$
Collector cutoff current	I_{CBO}	—	—	100	nA	$V_{CB} = 30$ V, $I_E = 0$
Emitter cutoff current	I_{EBO}	—	—	100	nA	$V_{EB} = 10$ V, $I_C = 0$
DC current transfer ratio	h_{FE1}*1	2000	—	100000		$I_C = 10$ mA, $V_{CE} = 5$ V
	h_{FE2}*1	3000	—	—		$I_C = 100$ mA, $V_{CE} = 5$ V (Pulse Test)
	h_{FE3}*1	3000	—	—		$I_C = 400$ mA, $V_{CE} = 5$ V (Pulse Test)
Collector to emitter saturation voltage	$V_{CE(sat)}$	—	—	1.5	V	$I_C = 100$ mA, $I_B = 0.1$ mA
Base to emitter voltage	$V_{BE(sat)}$	—	—	2.0	V	$I_C = 100$ mA, $I_B = 0.1$ mA
Gain bandwidth product	f_T	50	—	—	MHz	$V_{CE} = 5$ V, $I_C = 10$ mA
Collector output capacitance	Cob	—	—	10	pF	$V_{CB} = 10$ V, $I_E = 0$, f = 1 MHz
Turn on time	t_{on}	—	60	—	ns	$V_{CC} = 11$ V $I_C = 100\ I_{B1} = 100$ mA $I_{B2} = -I_{B1}$
Turn off time	t_{off}	—	800	—	ns	
Storage time	t_{stg}	—	350	—	ns	

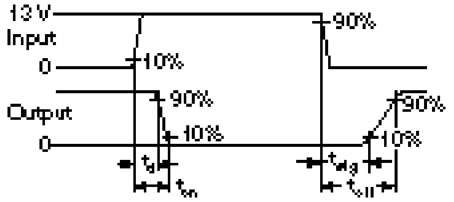
Note: 1. The 2SC1472(K) is grouped by h_{FE} as follows.

	A	B
h_{FE1}	2000 to 100000	5000 to 100000
h_{FE2}	3000 min	10000 min
h_{FE3}	3000 min	10000 min

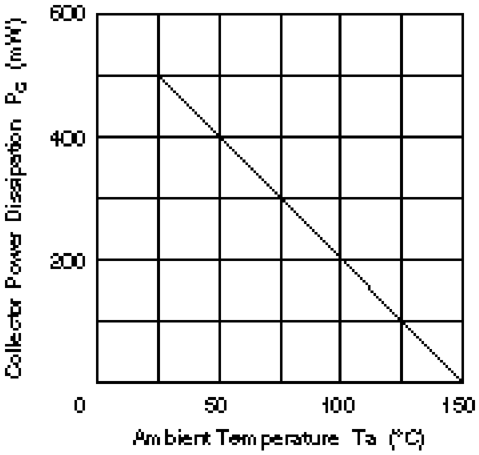
Switching Time Test Circuit



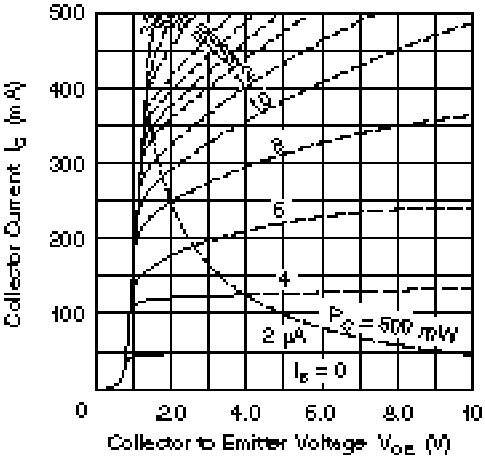
Response Waveform



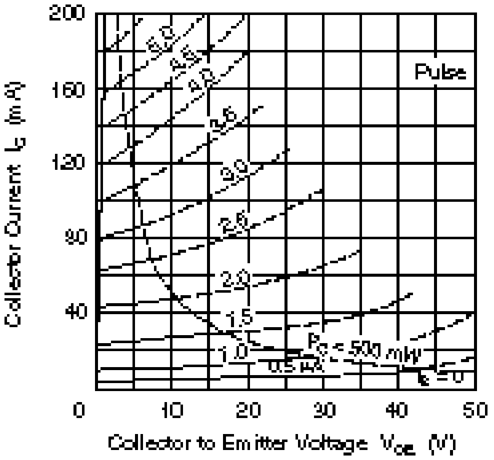
Maximum Collector Dissipation Curve



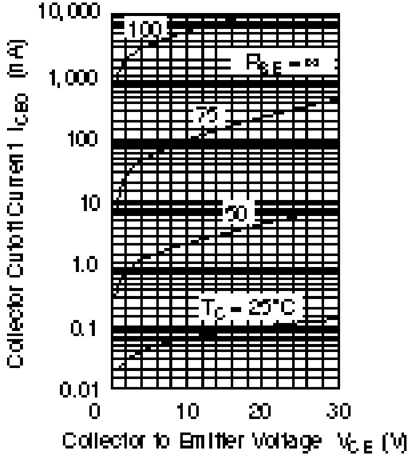
Typical Output Characteristics



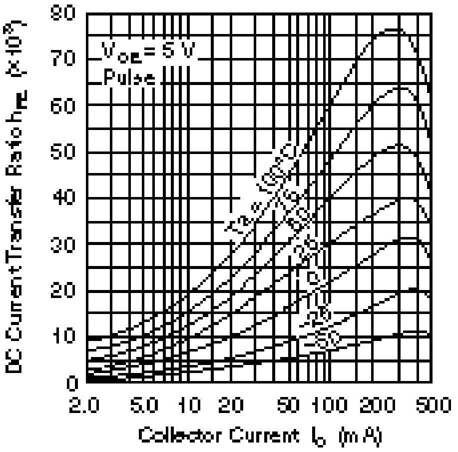
Typical Output Characteristics



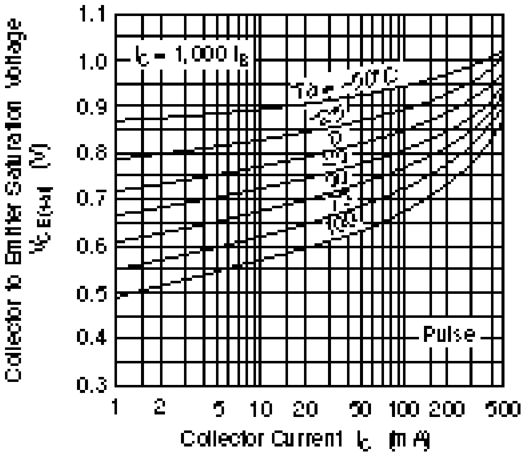
Collector Cutoff Current vs.
Collector to Emitter Voltage



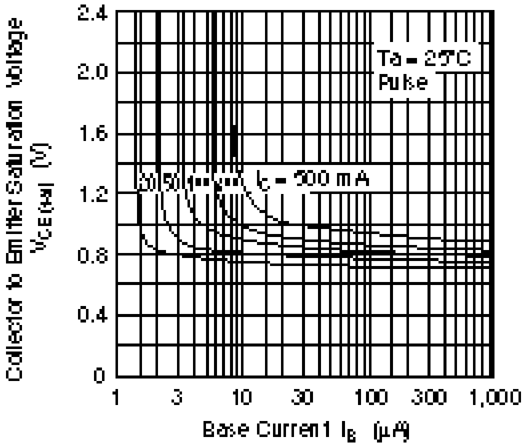
DC Current Transfer Ratio vs. Collector Current



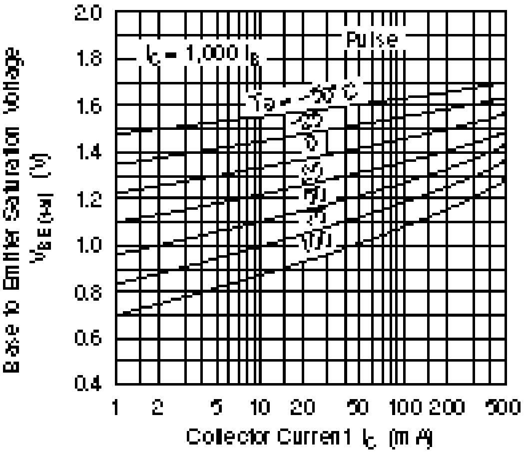
Collector to Emitter Saturation Voltage vs. Collector Current

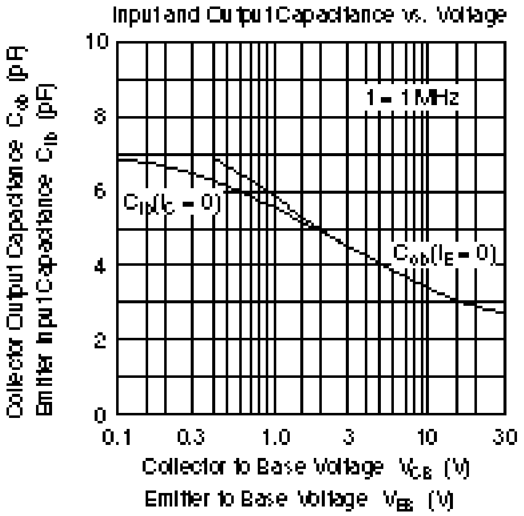


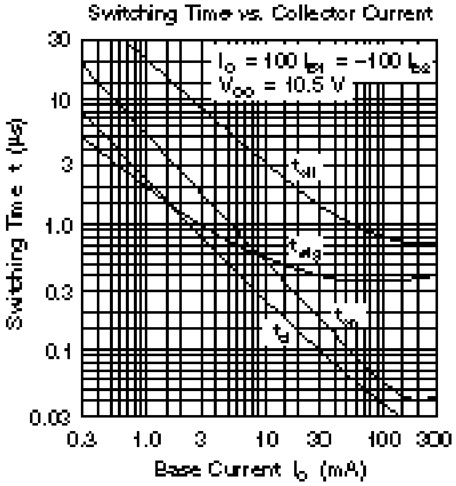
Collector to Emitter Saturation Voltage vs. Base Current

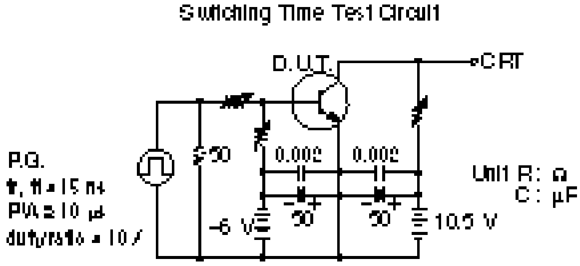


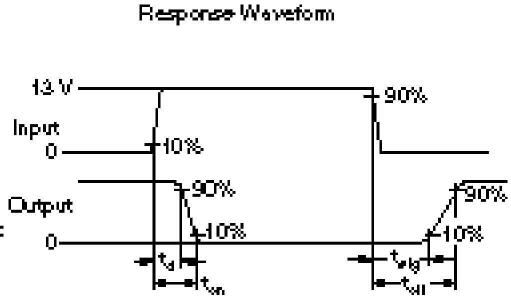
Base to Emitter Saturation Voltage vs. Collector Current




Input and Output Capacitance vs. Voltage
f = 1 MHz
C_{ib} (I_C = 0)
C_{ob} (I_E = 0)
Collector Output Capacitance C_{ob} (pF)
Emitter Input Capacitance C_{ib} (pF)
10
8
6
4
2
0
0.1
0.3
1.0
3
10
30
Collector to Base Voltage V_{CB} (V)
Emitter to Base Voltage V_{EB} (V)


Switching Time vs. Collector Current
I_C = 100 I_{B1} = −100 I_{B2}
V_{CC} = 10.5 V
t_{off}
t_{stg}
t_{on}
t_d
Switching Time t (µs)
30
10
3
1.0
0.3
0.1
0.03
0.3
1.0
3
10
30
100
300
Base Current I_B (mA)


Switching Time Test Circuit
D.U.T.
CRT
P.G.
tr, tf ≤ 15 ns
PW ≥ 10 µs
duty ratio ≤ 10%
50
0.002
0.002
30
30
−6 V
10.5 V
Unit R : Ω
C : µF


Response Waveform
13 V
Input
0
90%
10%
Output
0
90%
10%
90%
10%
t_d
t_{on}
t_{stg}
t_{off}

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