

Silicon NPN Transistor

2SC3046 / C3046

450V/10A

DATASHEET

OEM – Fujitsu

Source: Fujitsu Databook 1983

FUJITSU
MICROELECTRONICS

2SC3046

**SILICON HIGH SPEED RING EMITTER
NPN POWER TRANSISTOR 10 AMP, 450 VOLT**

ABSOLUTE MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector to Emitter Voltage	V_{CEO}	450	V
Collector to Base Voltage	V_{CBO}	600	V
Emitter to Base Voltage	V_{EBO}	7	V
Collector Current-Continuous	I_C	10	A
Collector Current-Pulsed $P_W \leq 10ms, D.R. \leq 2\%$	I_{CP}	20	A
Base Current-Continuous	I_B	5	A
Collector Power Dissipation ($T_C = 25^\circ C$)	P_C	100	W
Junction Temperature	T_j	+175	$^\circ C$
Storage Temperature Range	T_{stg}	-65 ~ +175	$^\circ C$



ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ C$)

Parameter	Symbol	Test Conditions	Limits			Unit
			Min.	Typ.	Max.	
Collector to Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = 1mA, I_E = 0$	600	—	—	V
Emitter to Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E = 1mA, I_C = 0$	7	—	—	V
Collector to Emitter Sustaining Voltage	$V_{CEO(sus)}$	$I_C = 0.8A, R_{BE} = \infty \Omega$	450	—	—	V
Collector to Emitter Sustaining Voltage	$V_{CEX(sus)}$	$I_C = 8A, I_{B2} = -1A, L = 200 \mu H$ (*1)	450	—	—	V
Collector Cutoff Current	I_{CBO}	$V_{CB} = 500V, I_E = 0$	—	—	100	μA
Collector Cutoff Current	I_{CBO}	$V_{CB} = 500V, I_E = 0, T_C = 100^\circ C$	—	—	1	mA
Emitter Cutoff Current	I_{EBO}	$V_{EB} = 6V, I_C = 0$	—	—	100	μA
DC Current Gain	h_{FE}	$V_{CE} = 5V, I_C = 6A$ (*2)	10	14	30	—
Collector to Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 6A, I_B = 1.2A$ (*2)	—	0.43	1.0	V
Base to Emitter Saturation Voltage	$V_{BE(sat)}$		—	1.05	1.5	V
Output Capacitance	C_{ob}	$V_{CB} = 10V, I_E = 0, f = 1MHz$	—	230	—	pF
Gain Bandwidth Product	f_T	$V_{CE} = 10V, I_C = 2A$	—	28	—	MHz
Rise Time	t_r	$V_{CC} = 150V$ (*1) $I_C = 6A, I_{B1} = -I_{B2} = 1.2A$	—	0.08	0.3	μs
Storage Time	t_{stg}		—	1.25	1.5	μs
Fall Time	t_f		—	0.07	0.2	μs

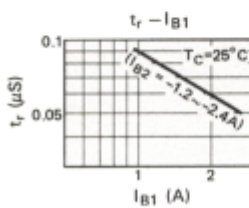
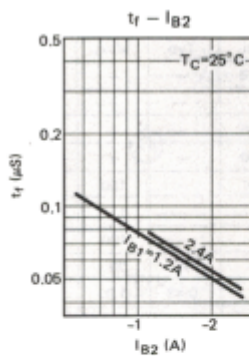
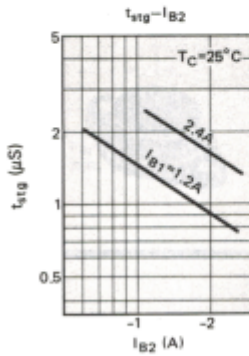
*1 Test Circuit *2 Pulsed $P_W \leq 300 \mu s$, Duty Ratio $\leq 6\%$

PACKAGE TYPE: TO-3. See page 5-23 for dimensions.

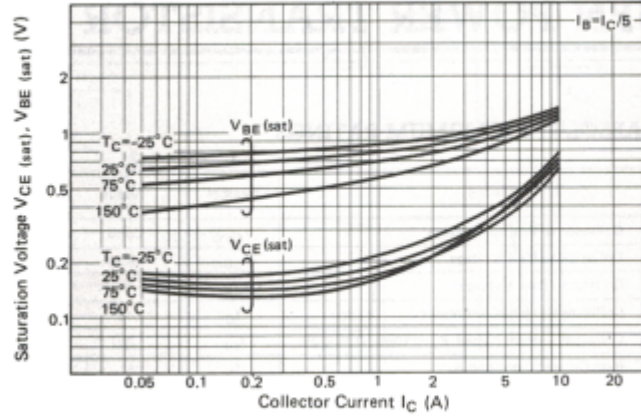
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SWITCHING TIME

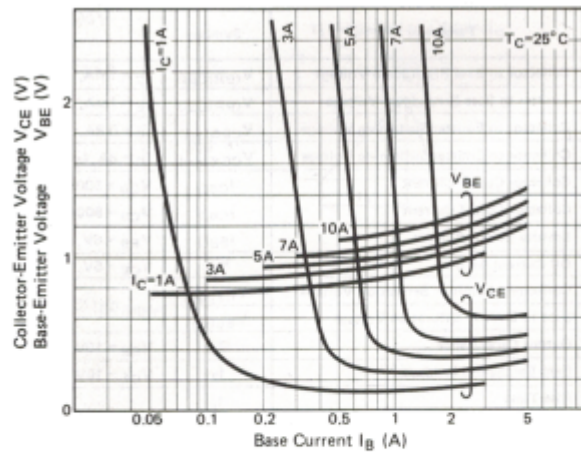
$V_{CC}=150V$
 $I_C=6A$
Pulsed (50 μ s)
Duty Ratio = 1%



SATURATION VOLTAGE

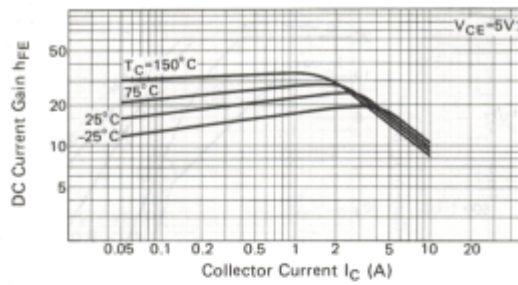


COLLECTOR SATURATION REGION

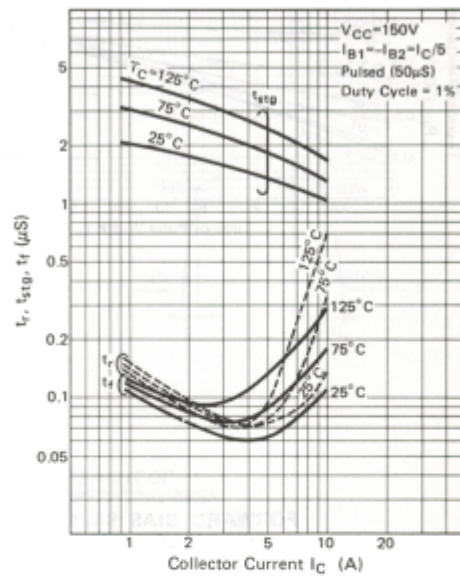


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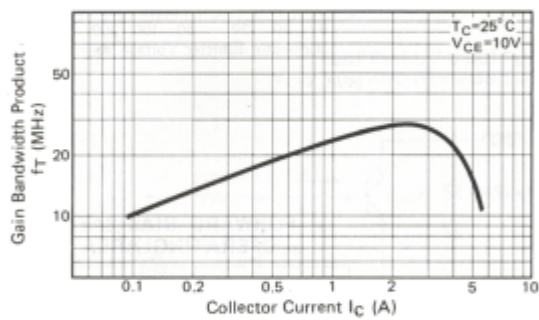
DC CURRENT GAIN



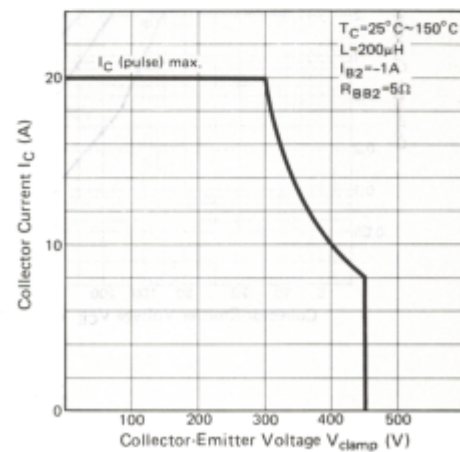
SWITCHING TIME



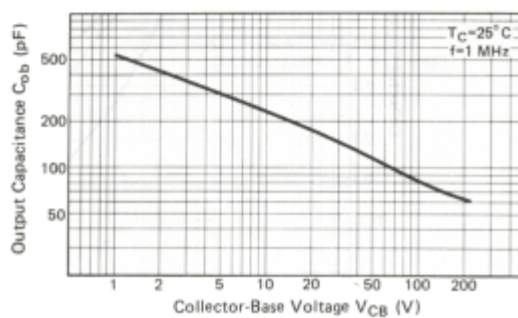
GAIN BANDWIDTH PRODUCT



REVERSE BIAS SAFE OPERATING AREA

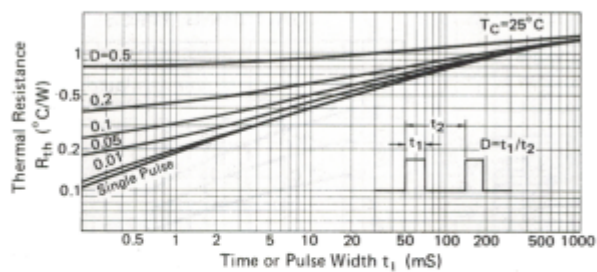
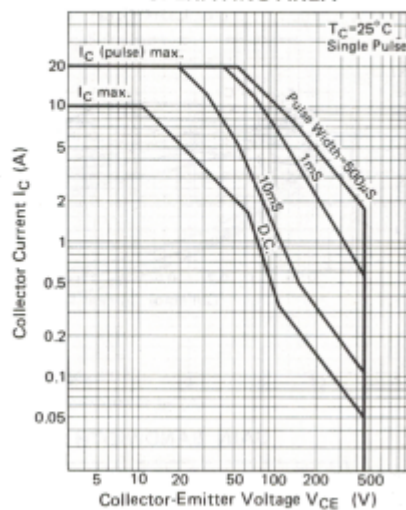
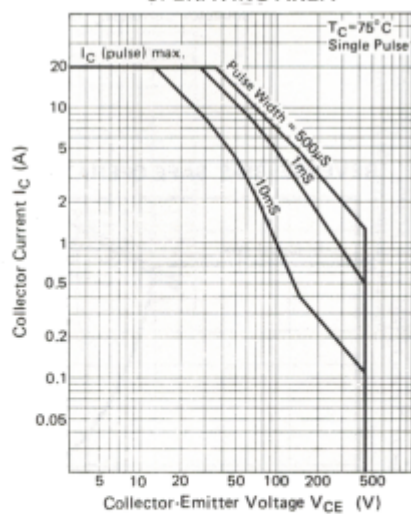
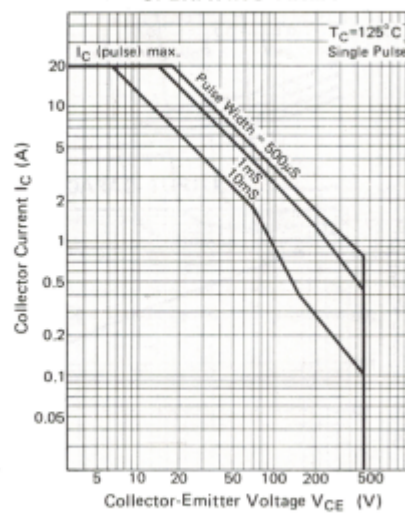


OUTPUT CAPACITANCE



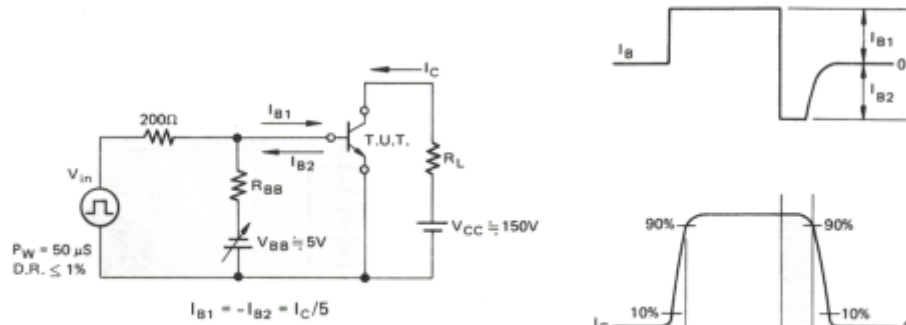
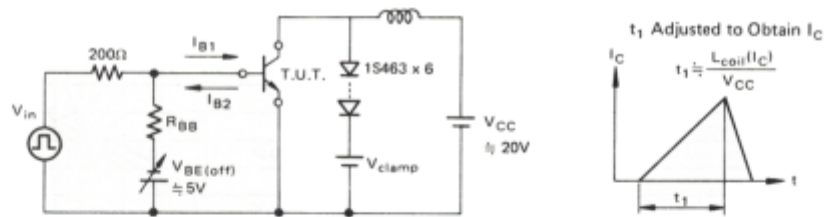
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THERMAL RESPONSE

FORWARD BIAS SAFE
OPERATING AREAFORWARD BIAS SAFE
OPERATING AREAFORWARD BIAS SAFE
OPERATING AREA

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TEST CIRCUIT USED FOR MEASUREMENT OF SWITCHING TIME (RESISTANCE)

TEST CIRCUIT USED FOR MEASUREMENT OF $V_{CEX(SUS)}$ AND REVERSE BIAS SAFE OPERATING AREA

- (a) $V_{CEX(SUS)}$
 $I_C = 8A, I_{B1} = 2A, I_{B2} = -1A, R_{BB} = 5\Omega, V_{clamp} = 450V$
- (b) Reverse Bias Safe Operating Area
 $I_{B1} \leq 4A, I_{B2} = -1A, R_{BB} = 5\Omega$

TRANSISTOR PACKAGING INFORMATION

