

January 1990
Edition 1.1



PRODUCT PROFILE

2SC3947

Silicon High Speed Power Transistor

2SC3947 500V, 5A

ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Conditions	Rating	Unit
Storage Temperature Range	T_{stg}		-55 ~ +150	°C
Junction Temperature	T_j		+150	°C
Collector to Base Voltage	V_{CBO}		850	V
Emitter to Base Voltage	V_{EBO}		7	V
Collector to Emitter Voltage	V_{CEO}		500	V
Collector Current	I_C		5	A
	I_{CM}	$P_W \leq 25\mu s, D.R. \leq 50\%$	8	
Base Current	I_B		2	A
Collector Power Dissipation	P_C	$T_C = 25^\circ C$	70	W

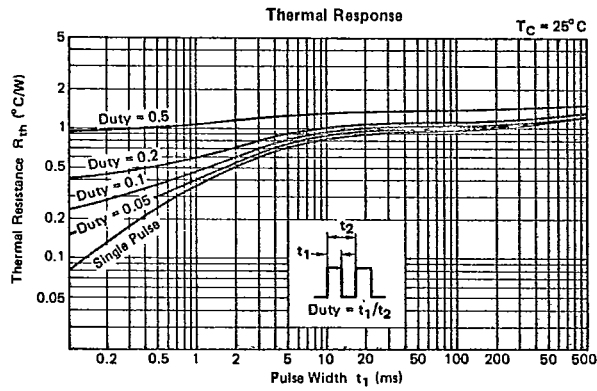
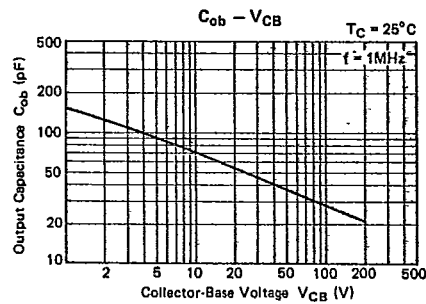
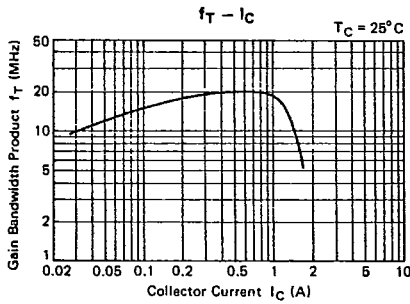
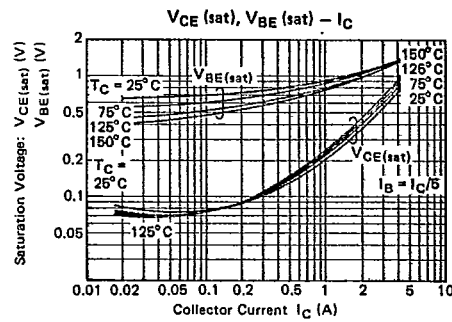
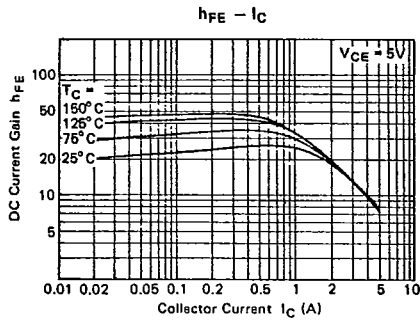


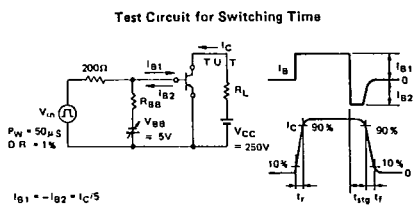
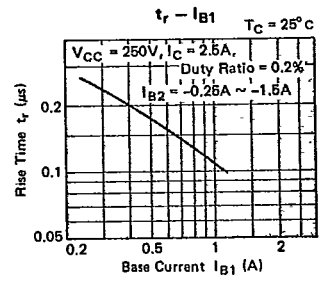
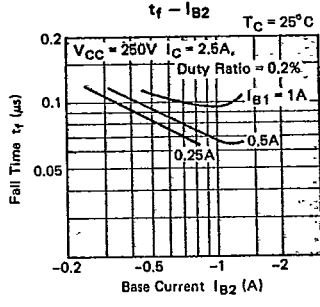
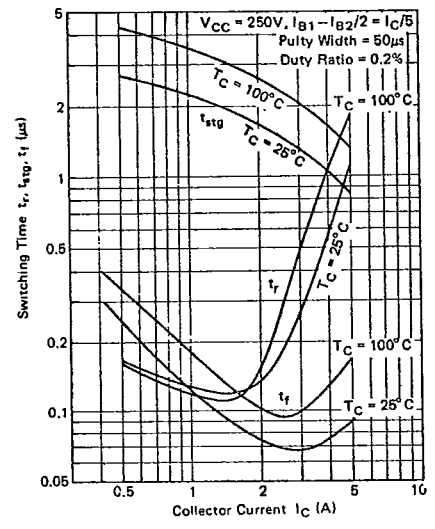
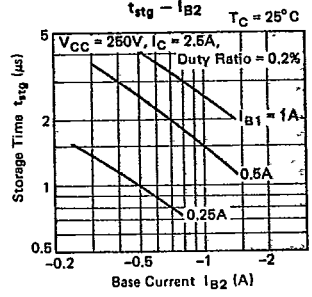
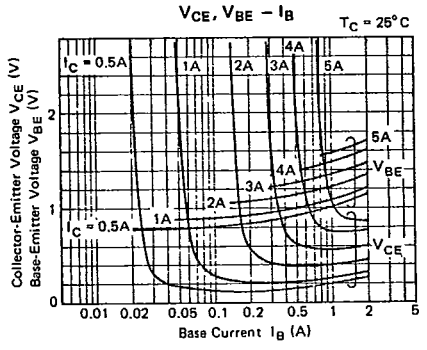
ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ C$)

Parameter	Symbol	Test Conditions	Limit			Unit
			Min.	Typ.	Max.	
Collector to Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = 1mA, I_E = 0$	850	-	-	V
Emitter to Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E = 1mA, I_C = 0$	7	-	-	V
Collector to Emitter Sustaining Voltage	$V_{(BR)CEO}$	$I_C = 10mA, R_{BE} = \infty\Omega$	500	-	-	V
Collector to Emitter Sustaining Voltage	$V_{CEX(SUS)}$	$I_C = 3A, I_{B2} = -1A, L = 200\mu H^*$	700	-	-	V
		$V_{CB} = 800V, I_E = 0$	-	-	100	μA
Collector Cutoff Current	I_{CBO}	$V_{CB} = 800V, I_E = 0, T_C = 100^\circ C$	-	-	1	mA
Emitter Cutoff Current	I_{EBO}	$V_{EB} = 6V, I_C = 0$	-	-	100	μA
DC Current Gain	h_{FE}	$V_{CE} = 5V, I_C = 2.5A^{**}$	10	15	30	-
Collector to Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 2.5A, I_B = 0.5A^{**}$	-	0.5	1.0	V
Base to Emitter Saturation Voltage	$V_{BE(sat)}$		-	1.2	1.5	V
Output Capacitance	C_{ob}	$V_{CB} = 10V, I_E = 0, f = 1MHz$	-	70	-	pF
Gain Bandwidth Product	f_T	$V_{CE} = 10V, I_E = 0.5A$	-	20	-	MHz
Rise Time	t_r	$V_{CC} = 250V, I_C = 2.5A, 2I_{B1} = -I_{B2} = 1A$	-	0.18	0.5	μs
Storage Time	t_{stg}		-	1.50	3.0	μs
Fall Time	t_f		-	0.07	0.3	μs

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

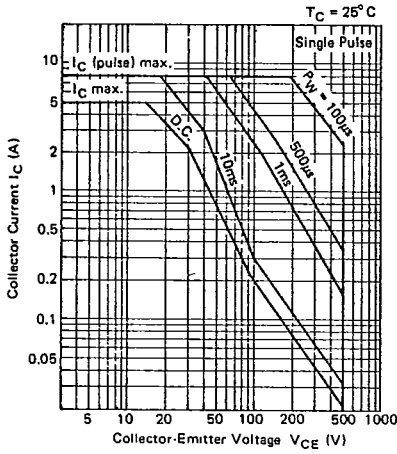
2SC3947



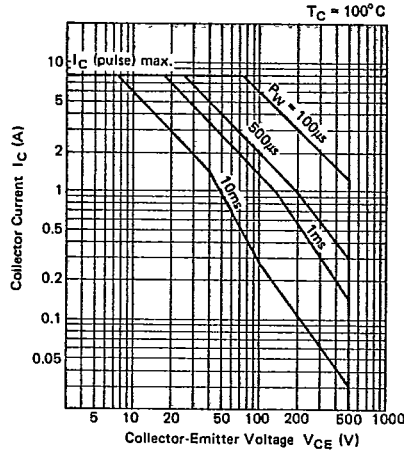


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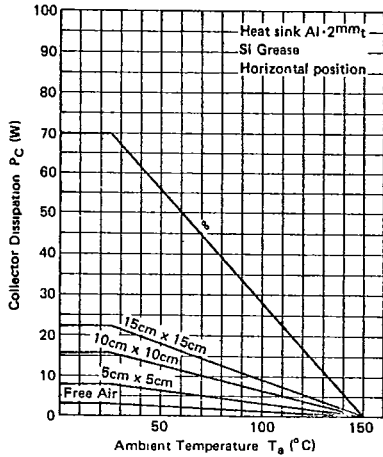
Forward Bias Safe Operating Area - 1



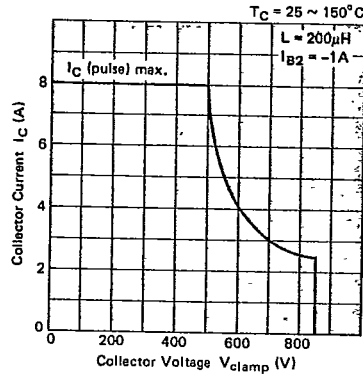
Forward Bias Safe Operating Area - 2



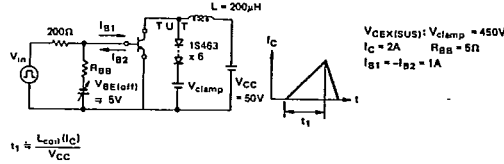
Pc - Ta



Reverse Bias Safe Operating Area



Test Circuit for VCE(sus) and Reverse Bias Safe Operating Area



TO-3PF FULL PLASTIC MOLD POWER TRANSISTORS
(RING EMITTER TRANSISTORS)

ELECTRICAL CHARACTERISTICS

Type No.	Maximum Ratings (T _a = 25°C)					Electrical Characteristics (T _a = 25°C)			
	V _{CB0} (V)	V _{CE0} (V)	I _C (A)	I _{CM} * (A)	P _C (W)	V _{CE} (V)	I _C (A)	h _{FE} Min.	t _f (μs)
									Max.
2SC3842	600	400	10	15	70	5	5	10	0.3
2SC3843	600	450	10	20	75	5	6	10	0.2
2SC3844	600	450	15	20	75	5	10	10	0.3
2SC3845	1200	800	3	6	75	5	1	10	0.3
2SC3846	1200	800	6	10	80	5	2	10	0.3
2SC3847	1200	800	10	20	85	5	4	10	0.3
2SC3947	850	500	5	8	70	5	2.5	10	0.3
2SC3948	850	500	10	15	75	5	5	10	0.3
2SC3949	850	500	15	20	80	5	10	10	0.3

* Pulsed P_w ≤ 25μs, D.R. ≤ 50%

• Package Outline and Terminal Configuration

