Die no. A-31

PNP medium power transistor

These epitaxial planar PNP silicon transistors are gold doped.

Features

- available in the following packages:
  - — SST3 (SST, SOT-23)
  - — SMT3 (SMT, SC-59)
  - — UMT3 (SST, SOT-323)
  - — MPT3 (MPT, SOT-89), see page 300
- collector-to-emitter breakdown voltage, BV_{CEO} = 40 V (min) at 1.0 mA
- current gain specified from 0.1 mA to 500 mA
- high transition frequency, f_T = 250 MHz (min) at I_C = 20 mA

Device types

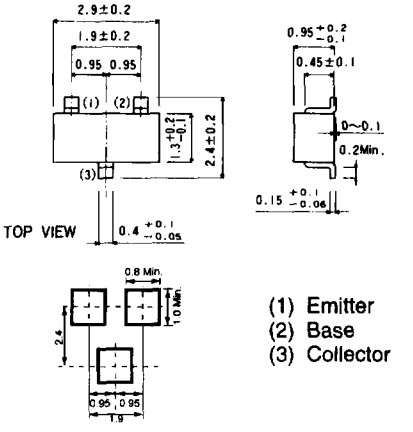
Package style	Part number	Part marking
SST3 (SOT-23)	SST2907A SST4403	R2F R2T
SMT3 (SC-59)	MMST2907A MMST4403	R2F R2T
UMT3 (SOT-323)	UMT2907A UMT4403	R2F R2T
MPT (SOT-89)	RXT2907A	AC

Applications

- general purpose, medium power, switching and amplifier transistor

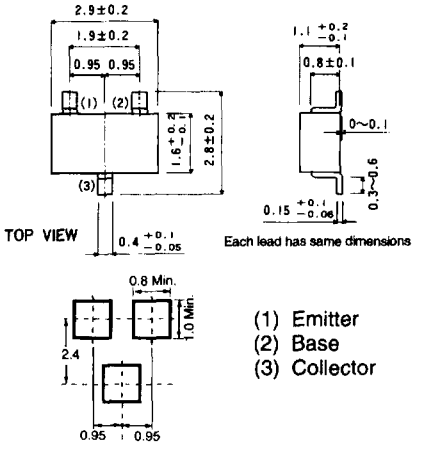
Dimensions (Units : mm)

SST3



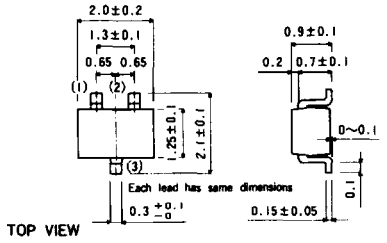
(1) Emitter
(2) Base
(3) Collector

SMT3



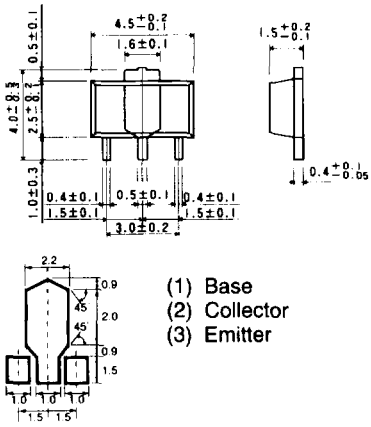
(1) Emitter
(2) Base
(3) Collector

UMT3



(1) Emitter
(2) Base
(3) Collector

MPT3



(1) Base
(2) Collector
(3) Emitter

Absolute maximum ratings (T_a = 25°C)

Parameter		Symbol	Limits	Unit	Conditions
Collector-to-base voltage		V_{CBO}	50	V	
Collector-to-emitter voltage		V_{CEO}	40	V	
Emitter-to-base voltage		V_{EBO}	6	V	
Collector current		I_C	800	mA	DC
Power dissipation	SST3 (SOT-23)	P_C	200	mW	For derating, see derating curve following
	SMT3 (SC-59)		200		
	UMT3 (SOT-323)		200		
	MPT3 (SOT-89)		500		
Junction temperature		T_j	−55 ~ +150	°C	

Electrical characteristics (unless otherwise noted, T_a = 25°C)

Parameter	Symbol	Min	Typical	Max	Unit	Conditions
Collector-to-base breakdown voltage	BV_{CBO}	50			V	I_C = 50 µA
Collector-to-emitter breakdown voltage	BV_{CEO}	40			V	I_C = 1.0 mA
Emitter-to-base breakdown voltage	BV_{EBO}	6			V	I_E = 10 µA
Collector cutoff current	I_{CBO}			50	nA	V_{CB} = 40 V
Emitter cutoff current	I_{EBO}			50	nA	V_{EB} = 4 V
DC current gain	h_{FE}	50	200			I_C = 100 µA, V_{CE} = 10 V
		50	230			I_C = 1.0 mA, V_{CE} = 10 V
		50	240			I_C = 10 mA, V_{CE} = 10 V
		50	210			I_C = 100 mA, V_{CE} = 10 V
		30	180			I_C = 500 mA, V_{CE} = 10 V
Collector-to-emitter saturation voltage	$V_{CE(sat)}$		0.1	0.4	V	I_C / I_B = 100 mA/10 mA
			0.3	0.6		I_C / I_B = 500 mA/50 mA
Base-to-emitter saturation voltage	$V_{BE(sat)}$			0.95	V	I_C / I_B = 100 mA/10 mA
				1.2		I_C / I_B = 500 mA/50 mA
AC current gain	h_{fe}	40				I_C = 10 mA, V_{CE} = 10 V, f = 1 kHz
Collector output capacitance	C_{ob}			7	pF	V_{CB} = 5.0 V, I_E = 0, f = 1 MHz
Collector input capacitance	C_{ib}			25	pF	V_{EB} = 5.0 V, I_C = 0, f = 1 MHz
Transition frequency	f_T	200			MHz	I_C = 20 mA, V_{CE} = 10 V, f = 100 MHz
Noise figure	NF		2	3	dB	I_C = 100 µA, V_{CE} = 10 V, R_S = 10 kΩ, f = 1 kHz
Rise time	t_r			15	ns	I_C = 150 mA, I_{B1} = 15 mA, V_{CC} = 30 V
Delay time	t_d			20	ns	I_C = 150 mA, I_{B1} = 15 mA, V_{CC} = 30 V
Turn on time	t_{on}			35	ns	I_C = 150 mA, I_{B1} = 15 mA, V_{CC} = 30 V
Storage time	t_s			225	ns	I_C = 150 mA, I_{B1} = I_{B2} = 15 mA
Fall time	t_f			30	ns	I_C = 150 mA, I_{B1} = I_{B2} = 15 mA

Note: Minus sign for PNP transistor is omitted

Electrical characteristic curves

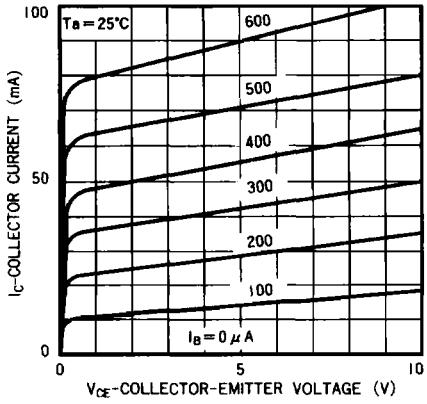


Figure 1

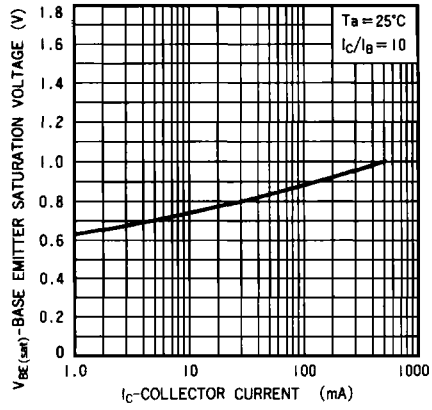


Figure 2

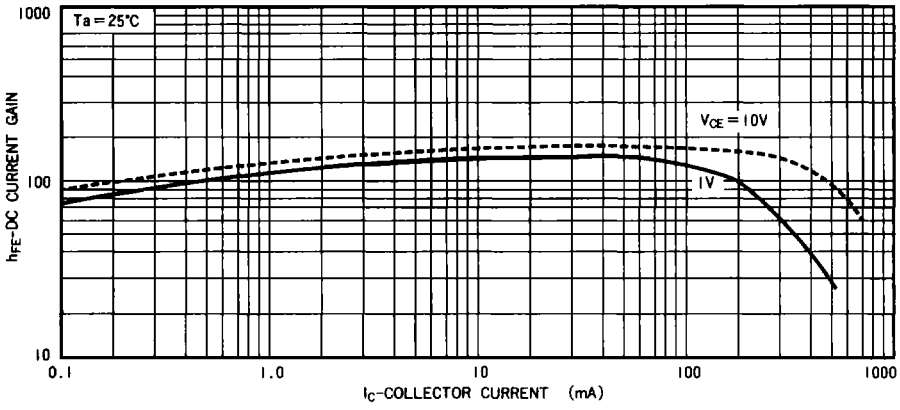


Figure 3

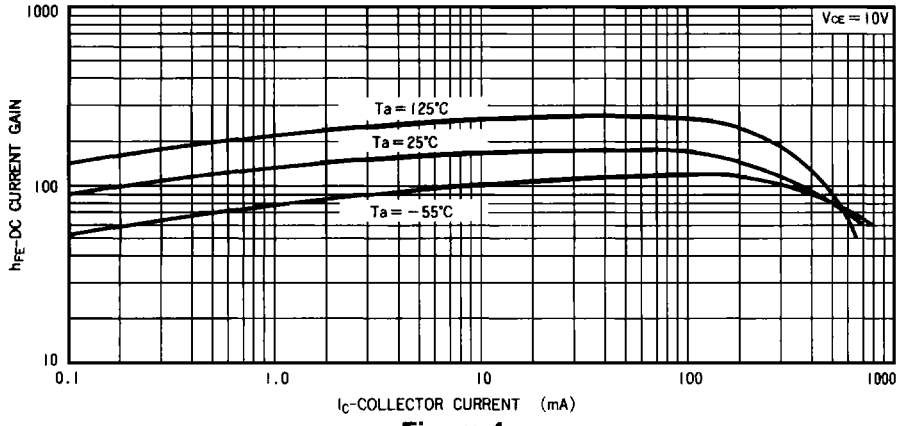


Figure 4

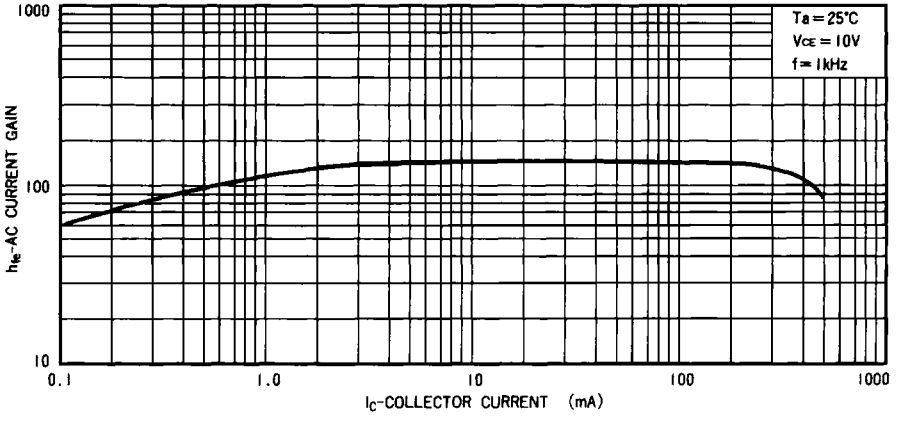


Figure 5

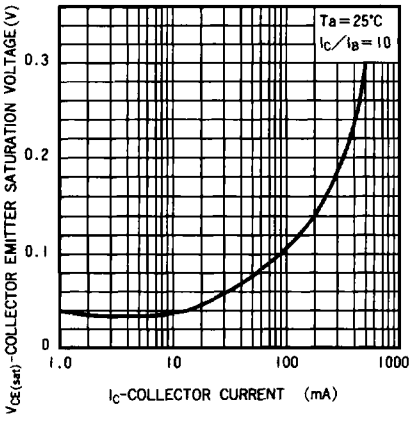


Figure 6

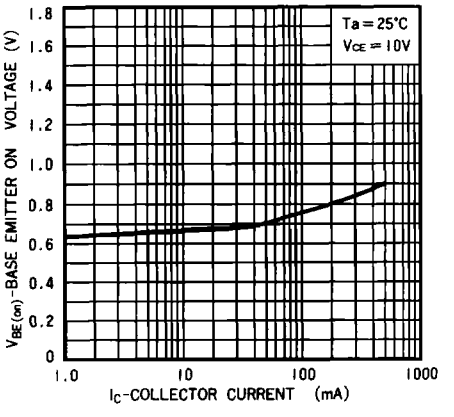


Figure 7

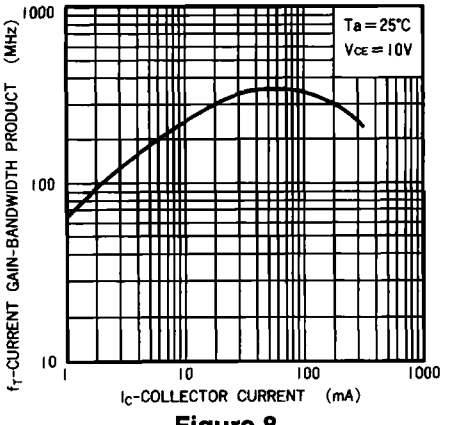


Figure 8

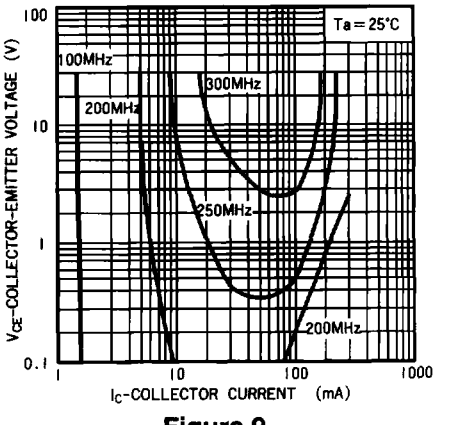


Figure 9

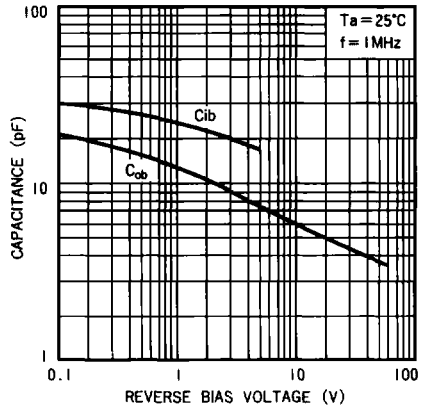


Figure 10

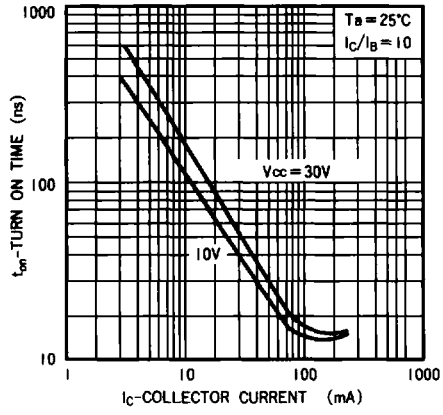


Figure 11

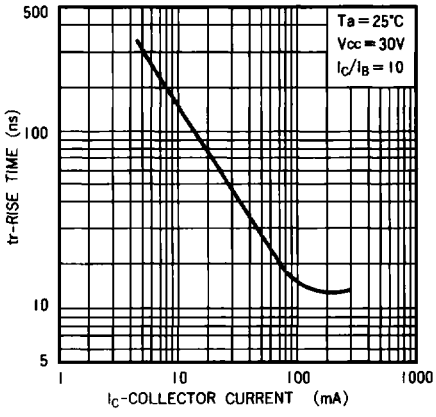


Figure 12

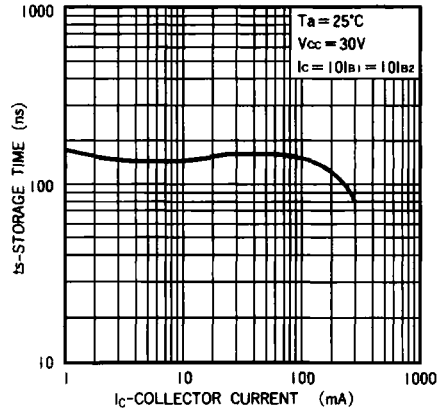


Figure 13

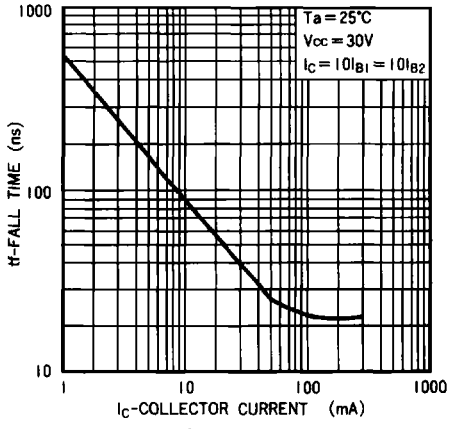


Figure 14

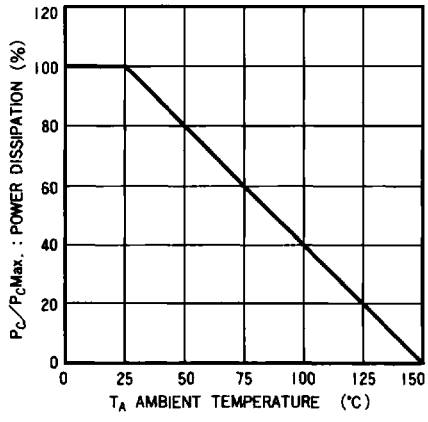


Figure 15