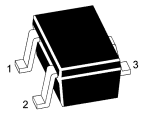
FUKUCOM COMPANY LTD.
福 靈 有 限 公 司
FLAT P, 3/F., EVEREST INDUSTRIAL CENTRE, 396 KWUN TONG ROAD,
KWUN TONG, KOWLOON, HONG KONG.
TEL: 852-2790 0314 FAX: 852-2790 0206

MMBT3904W

NPN Silicon Epitaxial Planar Transistor
for switching and amplifier applications



1.Base 2.Emitter 3.Collector
SOT-323 Plastic Package

Absolute Maximum Ratings (T_a = 25 °C)

Parameter	Symbol	Value	Unit
Collector Base Voltage	V_{CBO}	60	V
Collector Emitter Voltage	V_{CEO}	40	V
Emitter Base Voltage	V_{EBO}	6	V
Collector Current	I_C	200	mA
Total Power Dissipation	P_{tot}	200	mW
Junction Temperature	T_j	150	°C
Storage Temperature Range	T_S	-55 to +150	°C

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Dated : 15/03/2006

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Characteristics at T_a = 25 °C

Parameter	Symbol	Min.	Max.	Unit
DC Current Gain				
at V_{CE} = 1 V, I_C = 0.1 mA	h_{FE}	40	-	-
at V_{CE} = 1 V, I_C = 1 mA	h_{FE}	70	-	-
at V_{CE} = 1 V, I_C = 10 mA	h_{FE}	100	300	-
at V_{CE} = 1 V, I_C = 50 mA	h_{FE}	60	-	-
at V_{CE} = 1 V, I_C = 100 mA	h_{FE}	30	-	-
Collector Base Voltage at I_C = 10 µA	V_{CBO}	60	-	V
Collector Emitter Voltage at I_C = 1 mA	V_{CEO}	40	-	V
Emitter Base Voltage at I_E = 10 µA	V_{EBO}	6	-	V
Collector Emitter Cutoff Current at V_{CB} = 30 V	I_{CES}	-	50	nA
Emitter Base Cutoff Current at V_{EB} = 3 V	I_{EBO}	-	50	nA
Collector Emitter Saturation Voltage at I_C = 10 mA, I_B = 1 mA I_C = 50 mA, I_B = 5 mA	$V_{CE(sat)}$	- -	0.2 0.3	V
Base Emitter Saturation Voltage at I_C = 10 mA, I_B = 1 mA I_C = 50 mA, I_B = 5 mA	$V_{BE(sat)}$	0.65 -	0.85 0.95	V
Transition Frequency at V_{CE} = 20 V, $-I_E$ = 10 mA, f = 100 MHz	f_T	300	-	MHz
Collector Output Capacitance at V_{CB} = 10 V, f = 100 KHz	C_{ob}	-	4	pF
Emitter Input Capacitance at V_{EB} = 0.5 V, f = 100 KHz	C_{ib}	-	8	pF
Delay Time at V_{CC} = 3 V, $V_{BE(OFF)}$ = 0.5 V, I_C = 10 mA, I_{B1} = 1 mA	td	-	35	ns
Rise Time at V_{CC} = 3 V, $V_{BE(OFF)}$ = 0.5 V, I_C = 10 mA, I_{B1} = 1 mA	tr	-	35	ns
Storage Time at V_{CC} = 3 V, I_C = 10 mA, I_{B1} = $-I_{B2}$ = 1 mA	tstg	-	200	ns
Fall Time at V_{CC} = 3 V, I_C = 10 mA, I_{B1} = $-I_{B2}$ = 1 mA	tf	-	50	ns

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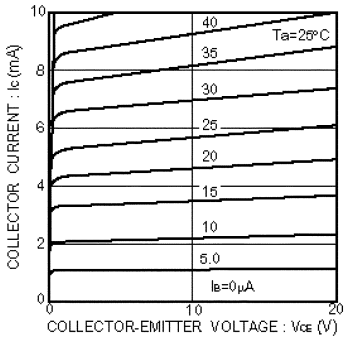

Fig.1 Grounded emitter output characteristics

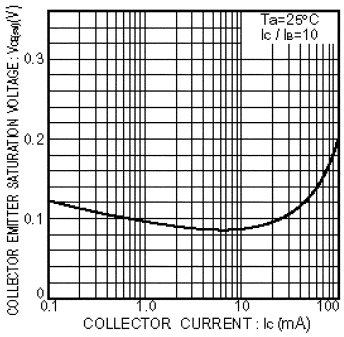

Fig.2 Collector-emitter saturation voltage vs. collector current

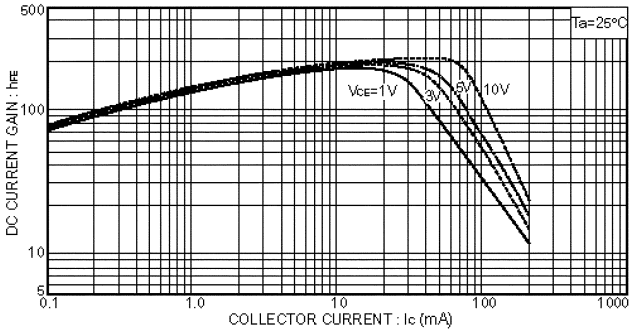

Fig.3 DC current gain vs. collector current (I)

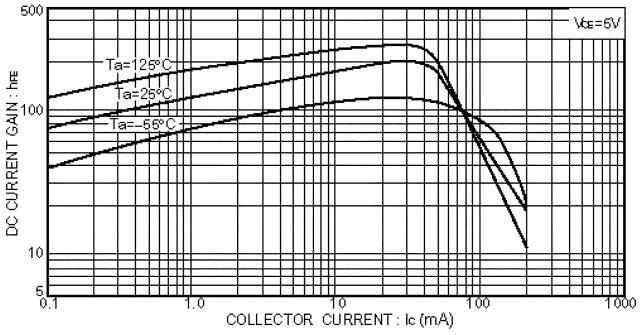

Fig.4 DC current gain vs. collector current (II)

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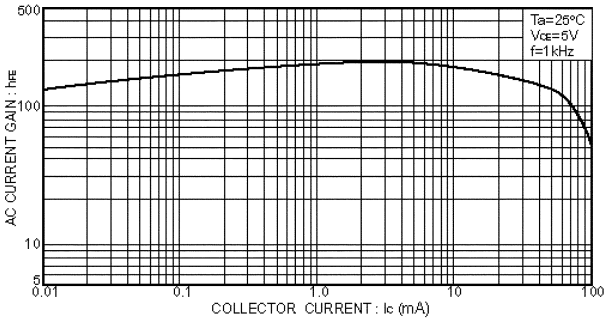

Fig.5 AC current gain vs. collector current

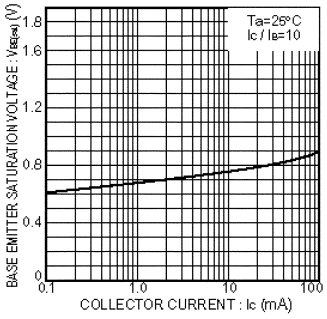

Fig.6 Base-emitter saturation voltage vs. collector current

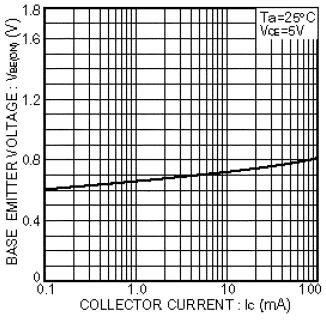

Fig.7 Grounded emitter propagation characteristics

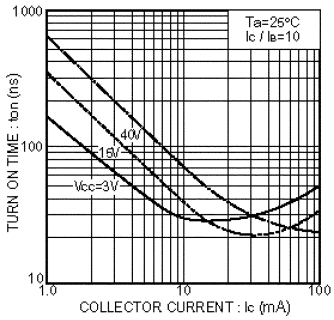

Fig.8 Turn-on time vs. collector current

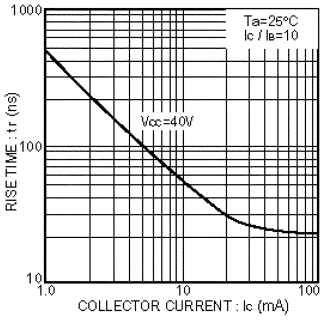

Fig.9 Rise time vs. collector current

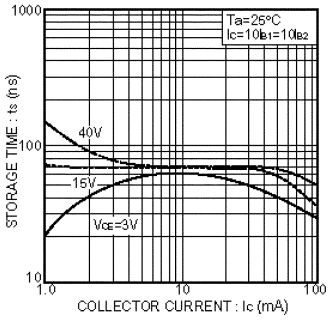

Fig.10 Storage time vs. collector current

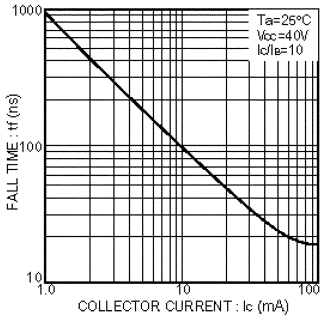

Fig.11 Fall time vs. collector current

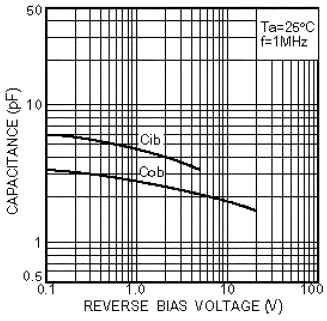

Fig.12 Input / output capacitance vs. voltage

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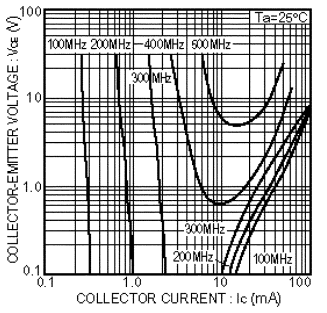

Fig.13 Gain bandwidth product

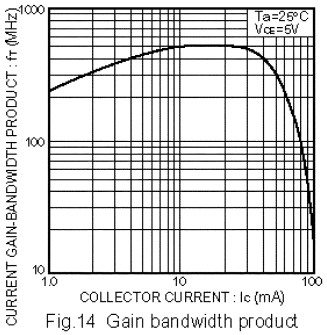

Fig.14 Gain bandwidth product vs. collector current

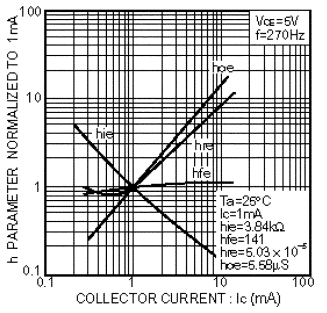

Fig.15 h parameter vs. collector current

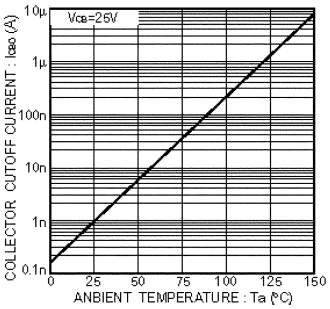

Fig.16 Noise characteristics (I)

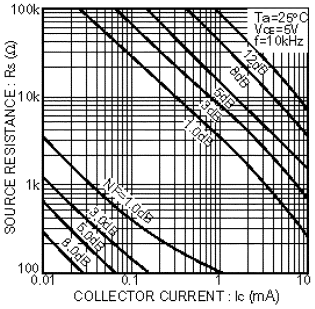

Fig.17 Noise characteristics (II)

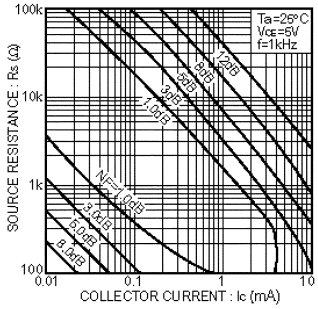

Fig.18 Noise characteristics (III)

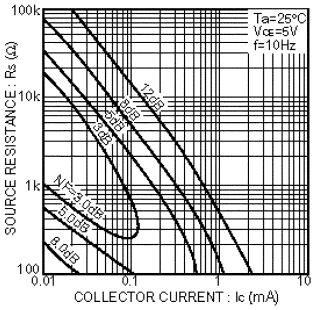

Fig.19 Noise characteristics (IV)

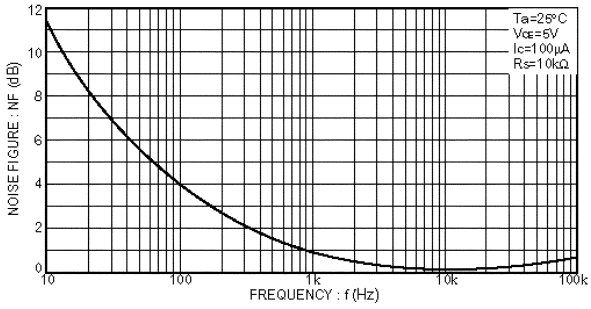

Fig.20 Noise vs. collector current

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