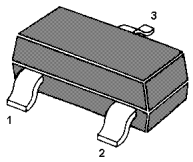
NPN Silicon Epitaxial Planar Transistor

High Frequency Low Noise Amplifier.

The transistor is subdivided into three groups, Q, R and S, according to its DC current gain.



1.Base 2.Emitter 3.Collector
SOT-23 Plastic Package

Features:

- Low Noise
  NF=1.2dB TYP. @ f=1GHz, V_{CE}=3V, I_C=7mA
- High Gain
  $|S_{21e}|^2$ =9.0dB TYP. @ f=1GHz, V_{CE}=3V, I_C=7mA

Description:

The MMBTSC4226 is a low supply voltage transistor designed for VHF, UHF low noise amplifier.

Absolute Maximum Ratings (T_a = 25 °C)

Parameter	Symbol	Value	Unit
Collector Base Voltage	V_{CBO}	20	V
Collector Emitter Voltage	V_{CEO}	12	V
Emitter Base Voltage	V_{EBO}	3	V
Collector Current	I_C	100	mA
Total Power Dissipation	P_{tot}	200	mW
Junction Temperature	T_j	150	°C
Storage Temperature Range	T_S	-65 to +150	°C

Characteristics at T_{amb}=25 °C

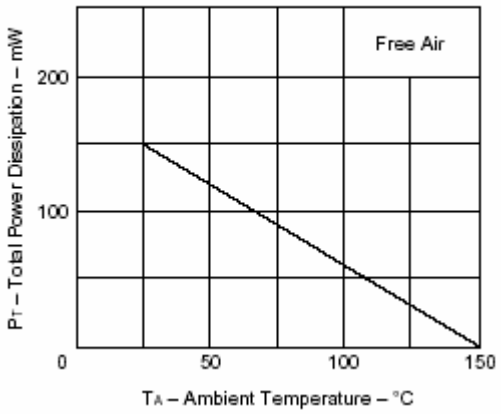
Parameter		Symbol	Min.	Typ.	Max.	Unit
DC Current Gain						
at V_{CE}=3V, I_C=7mA						
Current Gain Group	Q	h_{FE}	50	-	100	-
	R	h_{FE}	80	-	160	-
	S	h_{FE}	125	-	250	-
Collector Cutoff Current						
at V_{CB}=10V		I_{CBO}	-	-	1.0	μA
Emitter Cutoff Current						
at V_{EB}=1V		I_{EBO}	-	-	1.0	μA
Gain Bandwidth Product						
at V_{CE}=3V, I_C=7mA		f_T	3.0	4.5	-	GHz
Feed back Capacitance [1)]						
at V_{CE}=3V, f=1MHz		C_{re}	-	0.7	1.5	pF
Insertion Power Gain						
at V_{CE}=3V, I_C=7mA, f=1GHz		$\|S_{21e}\|$	7	9	-	dB
Noise Figure						
at V_{CE}=3V, I_C=7mA, f=1GHz		NF	-	1.2	2.5	dB

[1)] Measured with 3 terminal bridge, Emitter and case should be grounded.

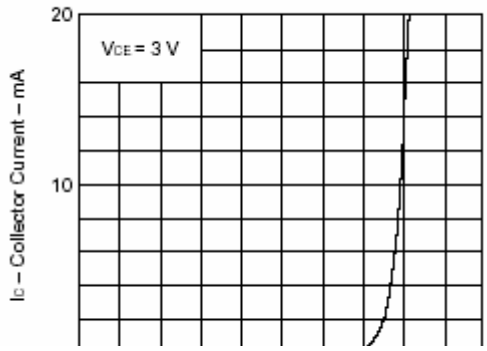
Classification of h_{FE}

RANK	Q	R	S
MARKING	R23	R24	R25
h_{FE}	50 ~100	80 ~160	125 ~250

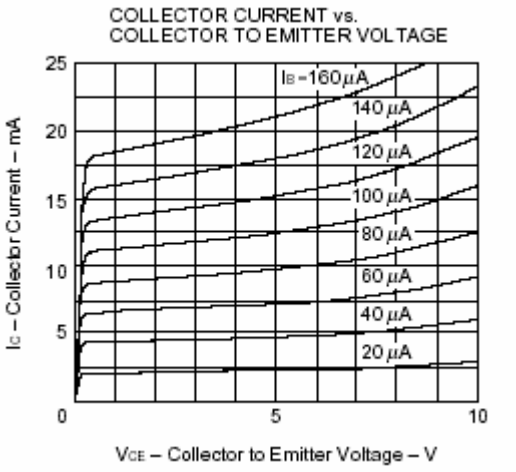
TOTAL POWER DISSIPATION
vs. AMBIENT TEMPERATURE



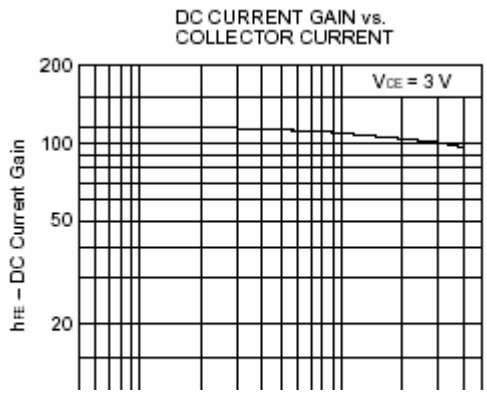
COLLECTOR CURRENT vs.
BASE TO EMITTER VOLTAGE



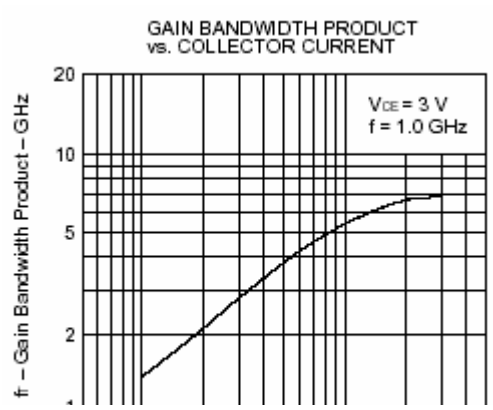
COLLECTOR CURRENT vs.
COLLECTOR TO EMITTER VOLTAGE



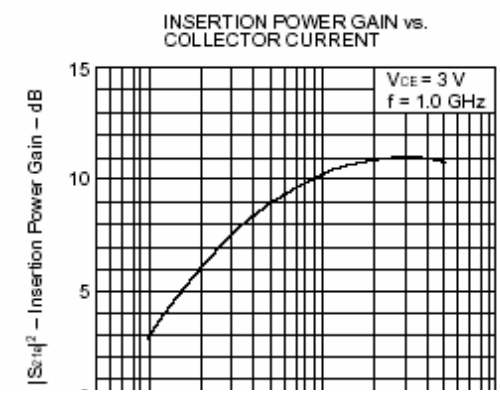
DC CURRENT GAIN vs.
COLLECTOR CURRENT

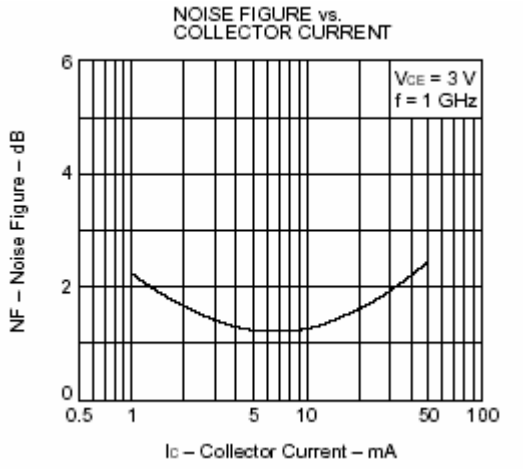


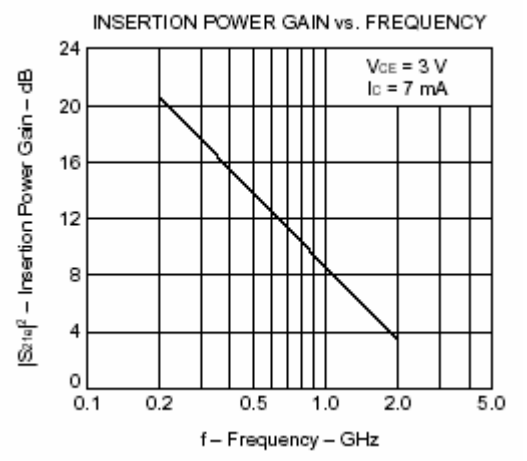
GAIN BANDWIDTH PRODUCT
vs. COLLECTOR CURRENT

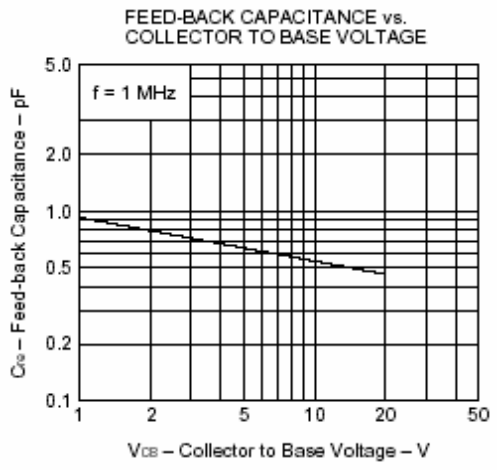


INSERTION POWER GAIN vs.
COLLECTOR CURRENT




NOISE FIGURE vs.
COLLECTOR CURRENT
VCE = 3 V
f = 1 GHz
NF – Noise Figure – dB
6
4
2
0
0.5
1
5
10
50
100
IC – Collector Current – mA


INSERTION POWER GAIN vs. FREQUENCY
VCE = 3 V
IC = 7 mA
|S21e|2 – Insertion Power Gain – dB
24
20
16
12
8
4
0
0.1
0.2
0.5
1.0
2.0
5.0
f – Frequency – GHz


FEED-BACK CAPACITANCE vs.
COLLECTOR TO BASE VOLTAGE
f = 1 MHz
Cre – Feed-back Capacitance – pF
5.0
2.0
1.0
0.5
0.2
0.1
1
2
5
10
20
50
VCB – Collector to Base Voltage – V