Ordering number:ENN462E

NPN Epitaxial Planar Silicon Transistor

2SC2078

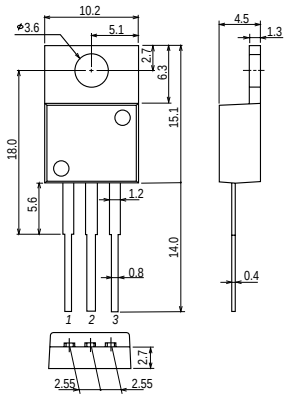
27MHz RF Power Amplifier Applications

Package Dimensions

unit:mm

2010C

[2SC2078]



1 : Base
2 : Collector
3 : Emitter
SANYO : TO-220

Specifications

Absolute Maximum Ratings at Ta = 25˚C

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V_{CBO}		80	V
Collector-to-Emitter Voltage	V_{CER}	R_{BE}=150Ω	75	V
Emitter-to-Base Voltage	V_{EBO}		5	V
Collector Current	I_C		3	A
Collector Current (Pulse)	I_{CP}		5	A
Collector Dissipation	P_C		1.2	W
		Tc=50˚C	10	W
Junction Temperature	Tj		150	˚C
Storage Temperature	Tstg		–55 to +150	˚C

Electrical Characteristics at Ta = 25˚C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	I_{CBO}	V_{CB}=40V, I_E=0			10	μA
Emitter Cutoff Current	I_{EBO}	V_{EB}=4V, I_C=0			10	μA
DC Current Gain	h_{FE}	V_{CE}=5V, I_C=0.5A	25*		200*	
Gain-Bandwidth Product	f_T	V_{CE}=10V, I_C=0.1A	100	150		MHz
Output Capacitance	C_{ob}	V_{CB}=10V, f=1MHz		45	60	pF

* : The 2SC2078 are classified by 0.5A h_{FE} as follows :

Continued on next page.

Rank	B	C	D	E
h_{FE}	25 to 50	40 to 80	60 to 120	100 to 200

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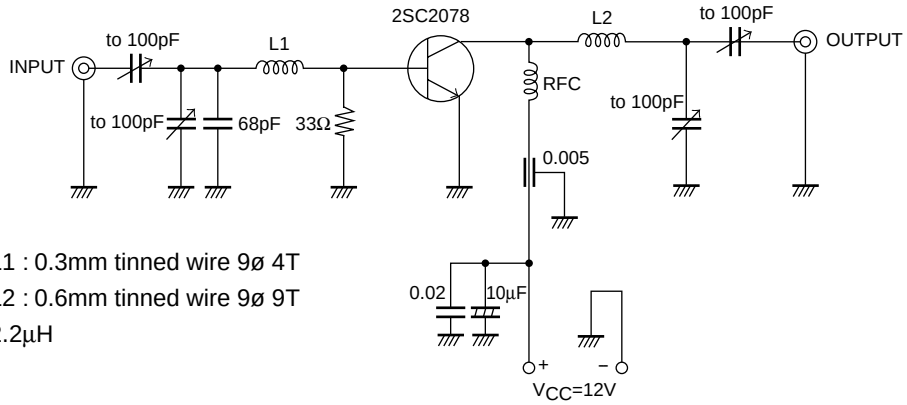
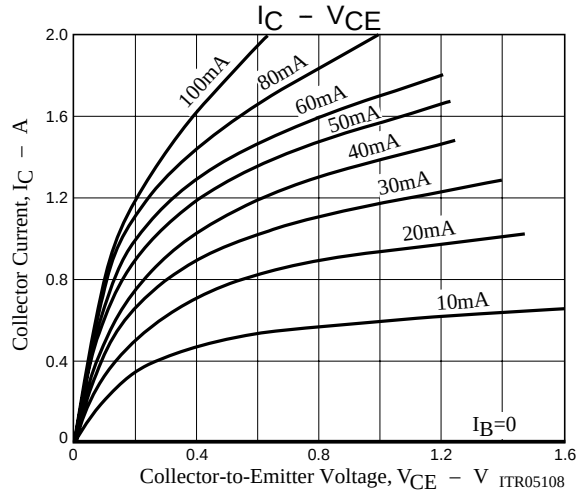
Continued from preceding page.

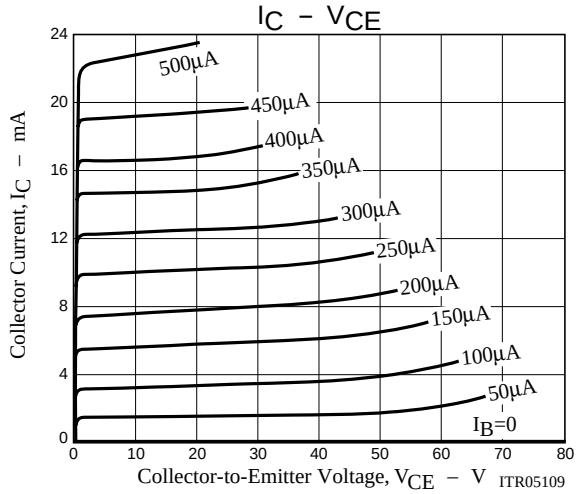
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	I_C=1A, I_B=0.1A		0.15	0.6	V
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	I_C=1A, I_B=0.1A		0.9	1.2	V
Collector-to-Base Saturation Voltage	$V_{(BR)CBO}$	I_C=100μA, I_B=0	80			V
Collector-to-Emitter Saturation Voltage	$V_{(BR)CER}$	I_C=1mA, R_{BE}=150Ω	75			V
Emitter-to-Base Saturation Voltage	$V_{(BR)EBO}$	I_E=100μA, I_C=0	5			V
[At specified test circuit]						
Output Power	P_O	V_{CC}=12V, f=27MHz, Pi=0.2W	4.0			W
Power Efficiency	η		60			%

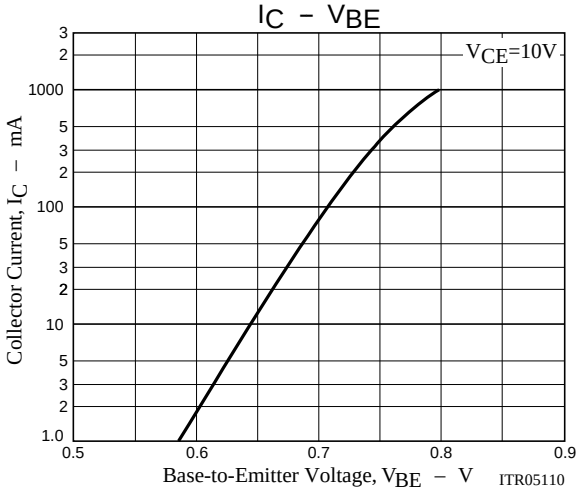
27MHz Output Power Test Circuit

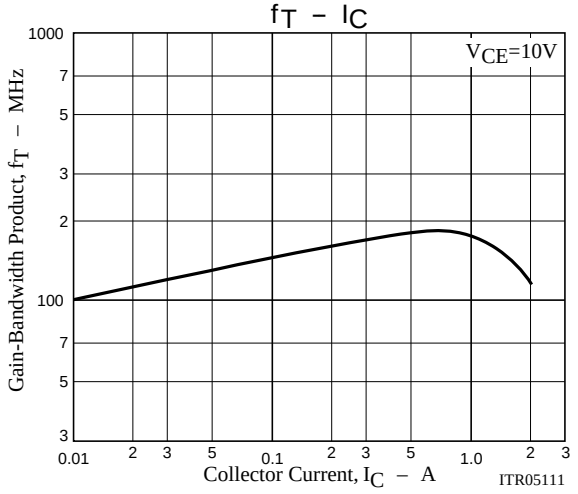


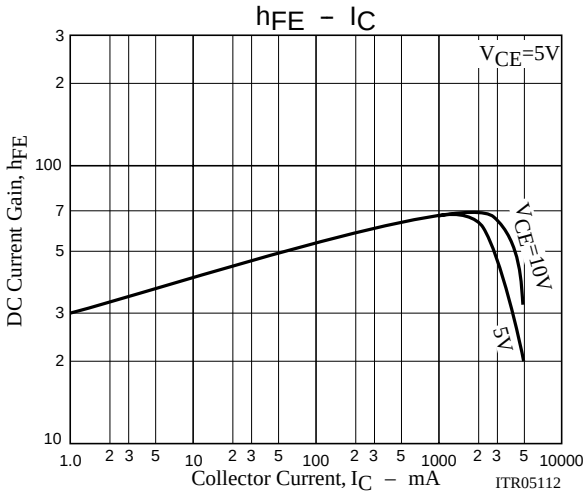
Coil data L1 : 0.3mm tinned wire 9ø 4T
L2 : 0.6mm tinned wire 9ø 9T
RFC 2.2μH

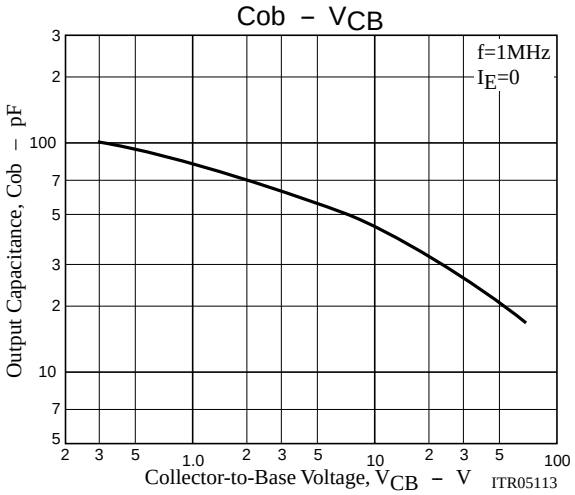


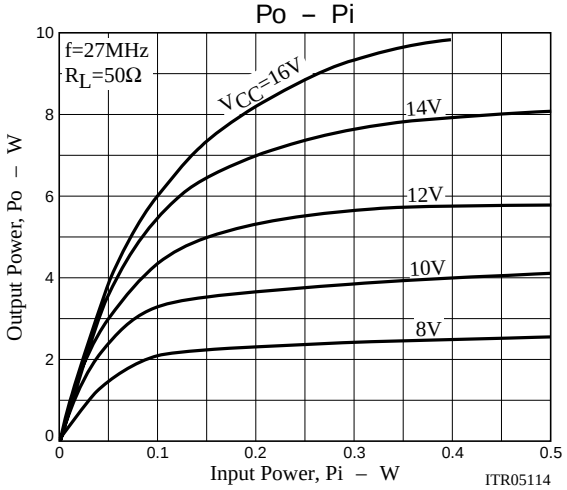


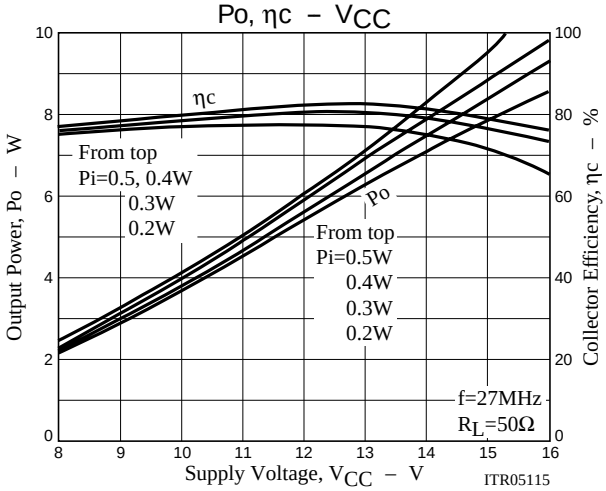


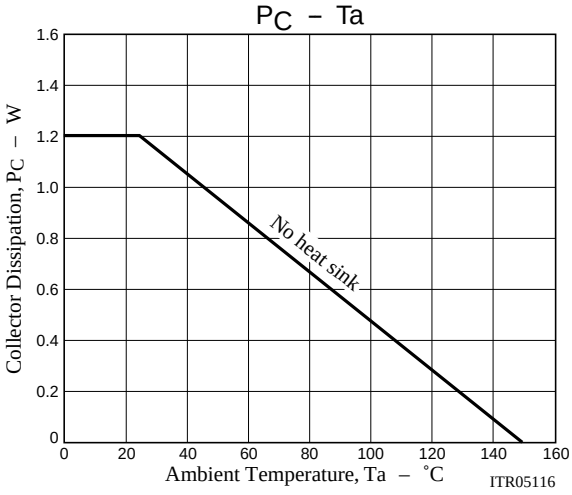


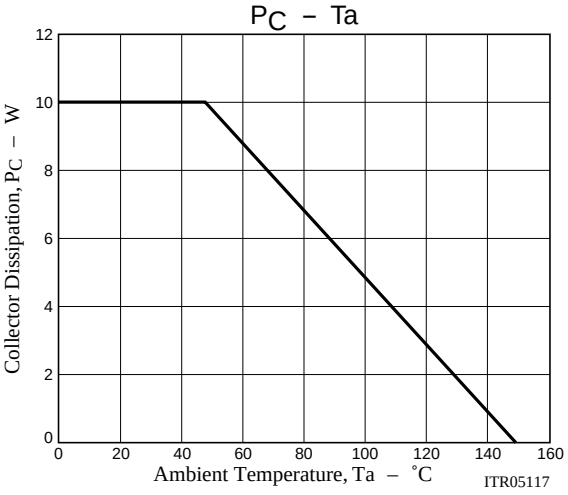

hFE – IC
VCE=5V
VCE=10V
5V
DC Current Gain, hFE
Collector Current, IC – mA
ITR05112


Cob – VCB
f=1MHz
IE=0
Output Capacitance, Cob – pF
Collector-to-Base Voltage, VCB – V
ITR05113


Po – Pi
f=27MHz
RL=50Ω
VCC=16V
14V
12V
10V
8V
Output Power, Po – W
Input Power, Pi – W
ITR05114


Po, ηc – VCC
ηc
From top
Pi=0.5, 0.4W
0.3W
0.2W
Po
From top
Pi=0.5W
0.4W
0.3W
0.2W
f=27MHz
RL=50Ω
Output Power, Po – W
Collector Efficiency, ηc – %
Supply Voltage, VCC – V
ITR05115


PC – Ta
No heat sink
Collector Dissipation, PC – W
Ambient Temperature, Ta – ˚C
ITR05116


PC – Ta
Collector Dissipation, PC – W
Ambient Temperature, Ta – ˚C
ITR05117

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