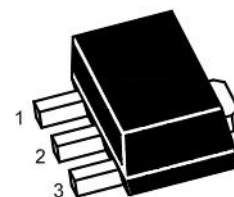


NPN Transistors

Features

- Low noise and high gain
- High power gain
- Large P_{tot}



1.Base 2.Collector 3.Emitter
SOT-89 Plastic Package

Classification of h_{fe}

Type	2SC3357	2SC3357
Range	50-160	125-250
Marking	RF	RE

Absolute Maximum Ratings $T_a = 25^\circ\text{C}$

Parameter	Symbol	Rating	Unit
Collector - Base Voltage	V_{CBO}	20	V
Collector - Emitter Voltage	V_{CEO}	12	
Emitter - Base Voltage	V_{EBO}	3	
Collector Current - Continuous	I_C	100	mA
Collector Power Dissipation	P_C	1.2	W
Junction to Ambient Resistance	$R_{th(j-a)}$	62.5	$^\circ\text{C/W}$
Junction Temperature	T_J	150	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-55 to 150	

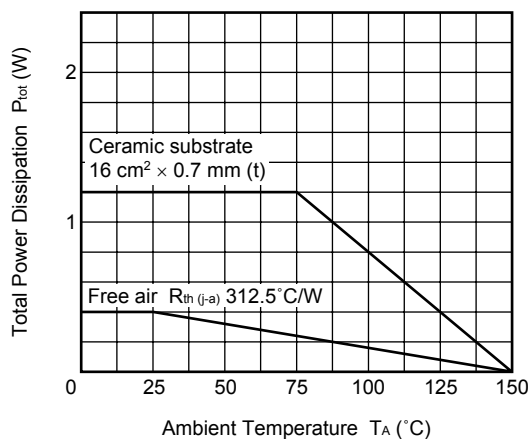
Electrical Characteristics $T_a = 25^\circ\text{C}$

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Collector- base breakdown voltage	V_{CBO}	$I_C = 100 \mu\text{A}$, $I_E = 0$	20			V
Collector- emitter breakdown voltage	V_{CEO}	$I_C = 1 \text{ mA}$, $I_B = 0$	12			
Emitter - base breakdown voltage	V_{EBO}	$I_E = 100 \mu\text{A}$, $I_C = 0$	3			
Collector-base cut-off current	I_{CBO}	$V_{CB} = 20\text{V}$, $I_E = 0$			1	μA
Emitter cut-off current	I_{EBO}	$V_{EB} = 3\text{V}$, $I_C = 0$			1	
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C = 50 \text{ mA}$, $I_B = 5 \text{ mA}$			0.4	V
Base - emitter saturation voltage	$V_{BE(sat)}$	$I_C = 50 \text{ mA}$, $I_B = 5 \text{ mA}$			1.2	
DC current gain (Note.1)	h_{FE}	$V_{CE} = 10\text{V}$, $I_C = 20 \text{ mA}$	50		250	
Insertion Power Gain	$ S_{21e} ^2$	$V_{CE} = 10\text{V}$, $I_C = 20 \text{ mA}$, $f = 1 \text{ GHz}$		9		dB
Noise Figure	NF	$V_{CE} = 10\text{V}$, $I_C = 7 \text{ mA}$, $f = 1 \text{ GHz}$		1.1		
		$V_{CE} = 10\text{V}$, $I_C = 40 \text{ mA}$, $f = 1 \text{ GHz}$		1.8	3	
Reverse Transfer Capacitance	C_{re}	$V_{CB} = 10\text{V}$, $I_E = 0$, $f = 1 \text{ MHz}$			1	pF
Transition frequency	f_T	$V_{CE} = 10\text{V}$, $I_C = 20 \text{ mA}$		6.5		GHz

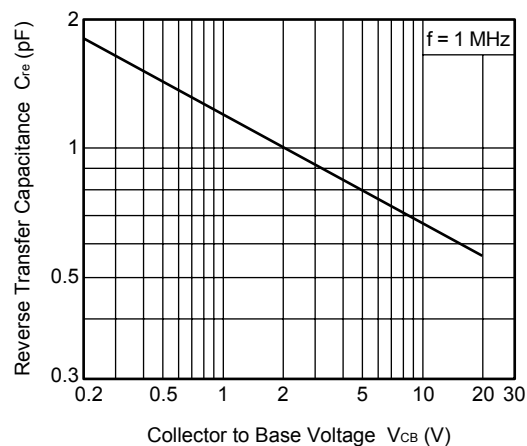
Note.1: Pulse measurement: $PW \leq 350 \mu\text{s}$, Duty Cycle $\leq 2\%$

Typical Characteristics

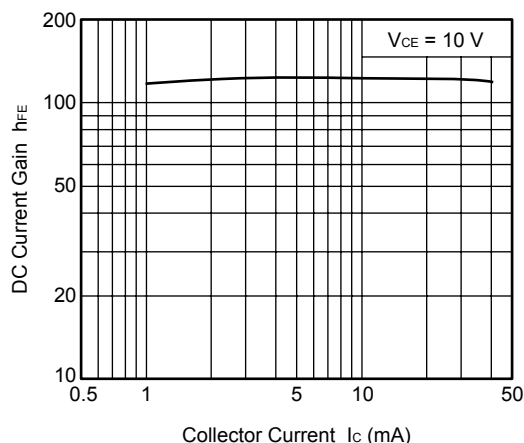
TOTAL POWER DISSIPATION
vs. AMBIENT TEMPERATURE



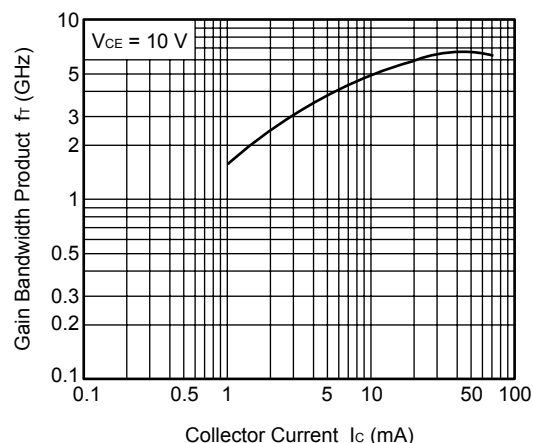
REVERSE TRANSFER CAPACITANCE
vs. COLLECTOR TO BASE VOLTAGE



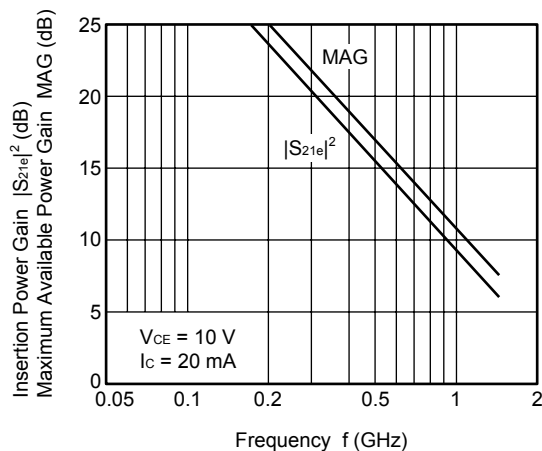
DC CURRENT GAIN vs.
COLLECTOR CURRENT



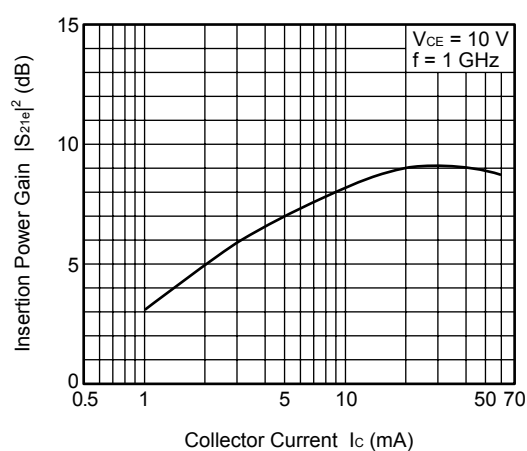
GAIN BANDWIDTH PRODUCT
vs. COLLECTOR CURRENT



INSERTION POWER GAIN, MAG
vs. FREQUENCY

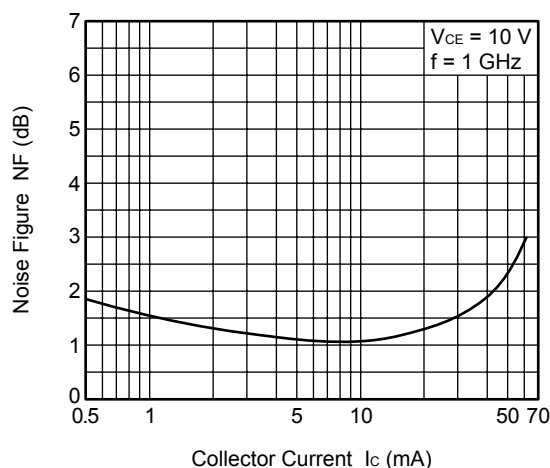


INSERTION POWER GAIN
vs. COLLECTOR CURRENT

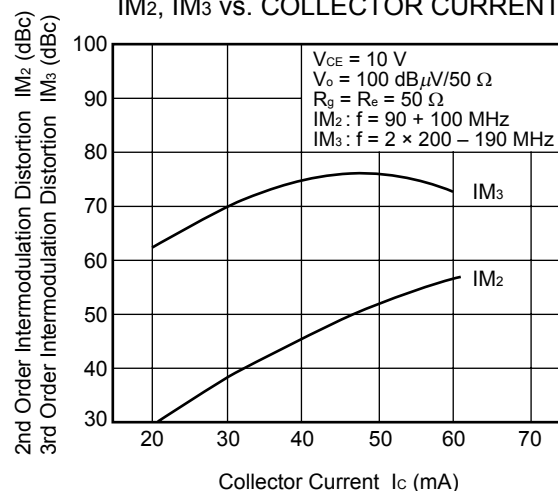


■ Typical Characteristics

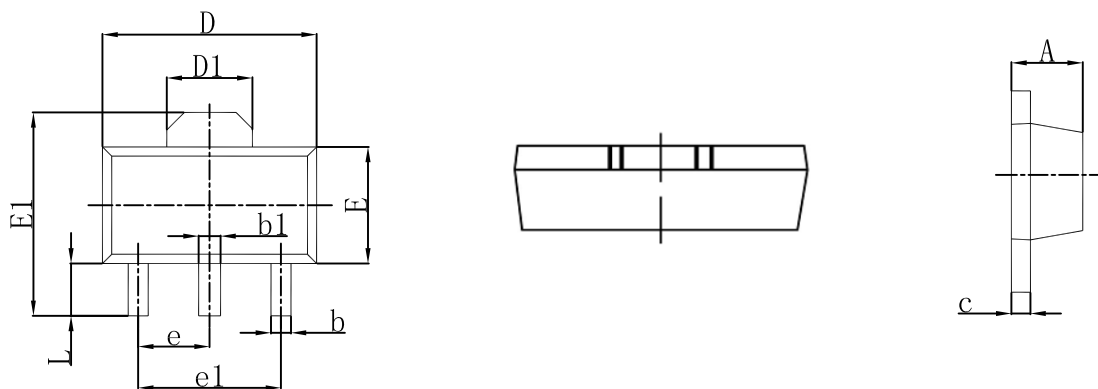
NOISE FIGURE vs.
COLLECTOR CURRENT



IM₂, IM₃ vs. COLLECTOR CURRENT



SOT-89 Outlines Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.400	1.600	0.055	0.063
b	0.320	0.520	0.013	0.020
b1	0.400	0.580	0.016	0.023
c	0.350	0.440	0.014	0.017
D	4.400	4.600	0.173	0.181
D1	1.550 REF.		0.061 REF.	
E	2.300	2.600	0.091	0.102
E1	3.940	4.250	0.155	0.167
e	1.500 TYP.		0.060 TYP.	
e1	3.000 TYP.		0.118 TYP.	
L	0.900	1.200	0.035	0.047