Ordering number:ENN6328

NPN Epitaxial Planar Silicon Transistor

2SC5551

High-Frequency Medium-Output Amplifier Applications

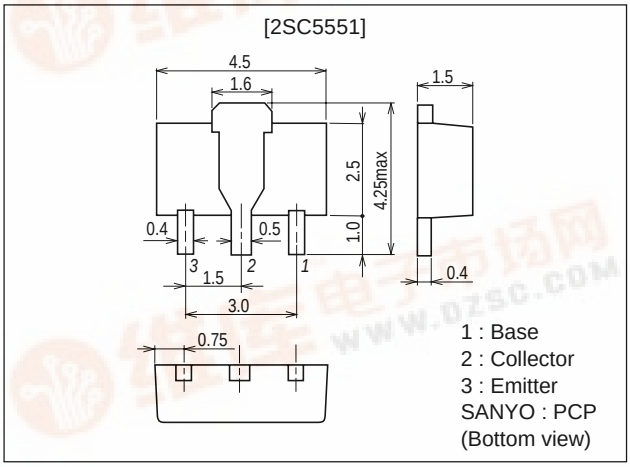
Features

- High f_T : (f_T=3.5GHz typ).
- Large current : (I_C=300mA).
- Large allowable collector dissipation (1.3W max).

Package Dimensions

unit:mm

2038A



Specifications

Absolute Maximum Ratings at Ta = 25˚C

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V_{CBO}		40	V
Collector-to-Emitter Voltage	V_{CEO}		30	V
Emitter-to-Base Voltage	V_{EBO}		2	V
Collector Current	I_C		300	mA
Collector Current (pulse)	I_{CP}		600	mA
Collector Dissipation	P_C	Mounted on a ceramic board (250mm²×0.8mm)	1.3	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}=20V, I_E=0			1.0	μA
Emitter Cutoff Current	I_{EBO}	V_{EB}=1V, I_C=0			5.0	μA
DC Current Gain	$h_{FE}1$	V_{CE}=5V, I_C=50mA	90		270	
	$h_{FE}2$	V_{CE}=5V, I_C=300mA	20			

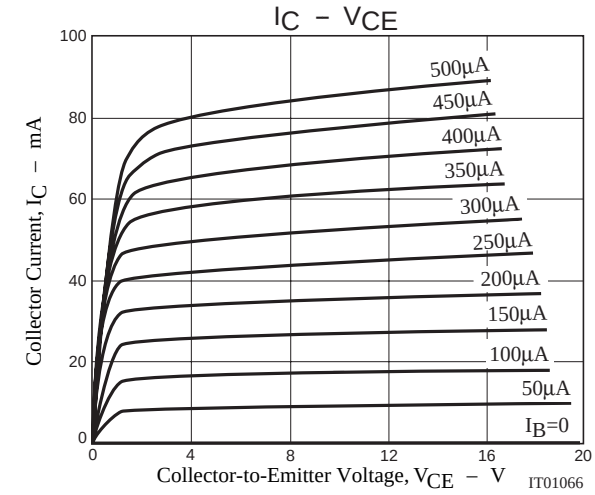
Continued on next page.

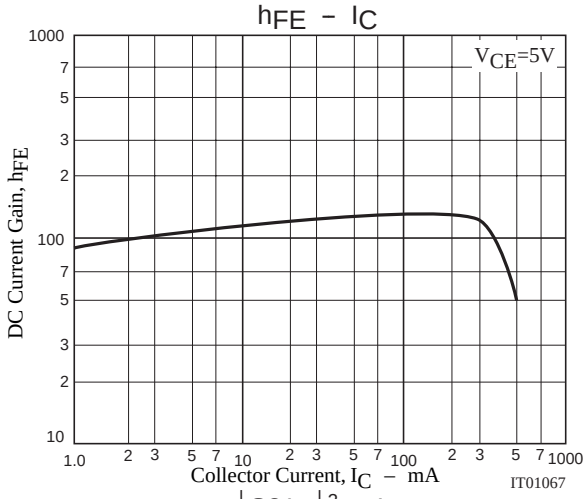
* : The 2SC5551 is classified by 50mA h_{FE} as follows :

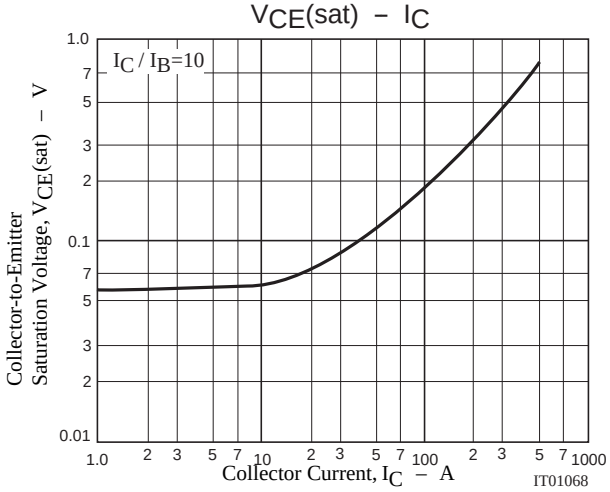
Marking	EB	
Rank	E	F
h_{FE}	90 to 180	135 to 270

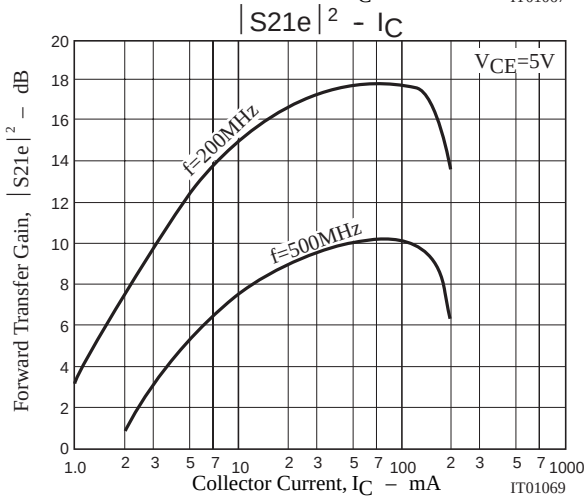
Continued from preceding page.

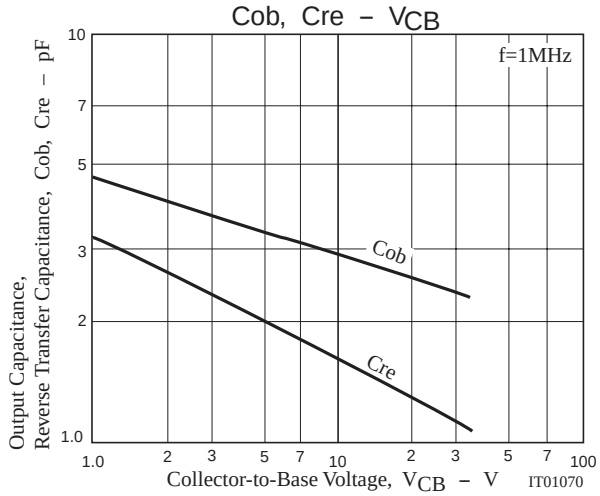
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Gain-Bandwidth Product	f_T	V_{CE}=5V, I_C=50mA		3.5		GHz
Output Capacitance	Cob	V_{CB}=10V, f=1MHz		2.9	4.0	pF
Reverse Transfer Capacitance	Cre	V_{CB}=10V, f=1MHz		1.5		pF
Collector-to-Emitter Saturation Voltage	V_{CE}(sat)	I_C=50mA, I_B=5mA		0.15	0.3	V
Collector-to-Base Saturation Voltage	V_{BE}(sat)	I_C=50mA, I_B=5mA		0.9	1.2	V

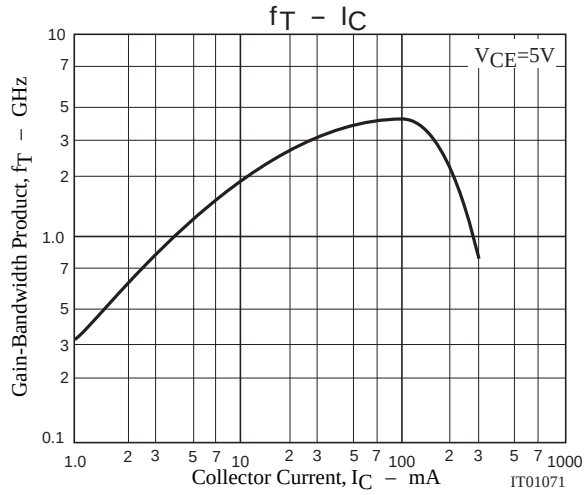


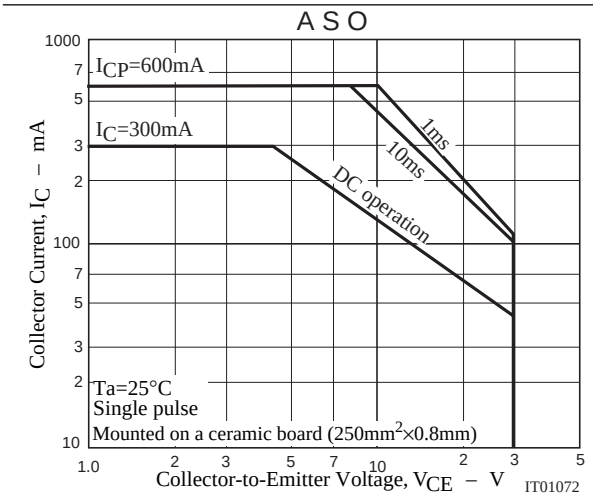


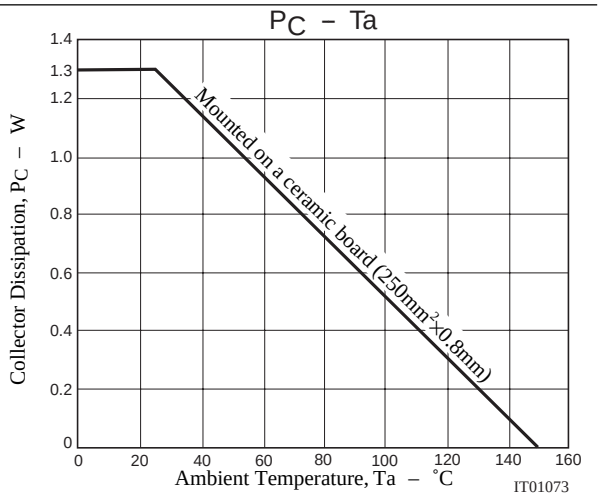












S Parameters (Common emitter)

V_{CE}=5V, I_C=1mA, Z_O=50Ω

Freq (MHz)	$\lvert S_{11} \rvert$	$\angle S_{11}$	$\lvert S_{21} \rvert$	$\angle S_{21}$	$\lvert S_{12} \rvert$	$\angle S_{12}$	$\lvert S_{22} \rvert$	$\angle S_{22}$
100	0.941	–101.1	2.373	119.9	0.088	38.7	0.884	–17.8
200	0.859	–141.0	1.425	93.8	0.097	18.3	0.821	–25.2
300	0.829	–158.6	0.990	79.4	0.088	12.0	0.755	–33.8
400	0.831	–169.5	0.845	69.2	0.074	10.7	0.766	–41.9
500	0.840	–178.6	0.715	61.1	0.058	25.2	0.798	–49.9
600	0.816	172.3	0.638	54.7	0.055	51.6	0.790	–58.4
700	0.816	164.9	0.507	49.8	0.064	78.4	0.771	–66.7
800	0.814	157.3	0.466	47.0	0.098	87.3	0.813	–75.0
900	0.800	150.9	0.443	45.7	0.134	90.2	0.792	–82.8
1000	0.804	145.0	0.388	47.3	0.173	92.2	0.782	–90.0

V_{CE}=5V, I_C=5mA, Z_O=50Ω

Freq (MHz)	$\lvert S_{11} \rvert$	$\angle S_{11}$	$\lvert S_{21} \rvert$	$\angle S_{21}$	$\lvert S_{12} \rvert$	$\angle S_{12}$	$\lvert S_{22} \rvert$	$\angle S_{22}$
100	0.803	–114.9	7.414	115.7	0.068	41.3	0.635	–36.3
200	0.724	–151.3	4.172	93.7	0.076	31.5	0.472	–41.7
300	0.701	–165.9	2.952	82.3	0.078	35.0	0.431	–45.4
400	0.700	–175.1	2.286	73.9	0.082	42.9	0.432	–50.2
500	0.693	177.1	1.857	66.6	0.091	51.9	0.437	–56.6
600	0.689	170.2	1.559	60.0	0.100	58.6	0.443	–63.4
700	0.695	164.3	1.371	54.3	0.117	64.7	0.451	–70.3
800	0.691	158.3	1.174	48.8	0.137	69.1	0.463	–77.3
900	0.693	153.0	1.067	44.5	0.161	71.4	0.479	–84.1
1000	0.705	147.9	0.988	40.9	0.189	72.3	0.496	–90.3

V_{CE}=5V, I_C=10mA, Z_O=50Ω

Freq (MHz)	$\lvert S_{11} \rvert$	$\angle S_{11}$	$\lvert S_{21} \rvert$	$\angle S_{21}$	$\lvert S_{12} \rvert$	$\angle S_{12}$	$\lvert S_{22} \rvert$	$\angle S_{22}$
100	0.718	–127.2	10.489	111.3	0.059	43.0	0.509	–50.8
200	0.658	–157.9	5.747	92.2	0.069	41.0	0.329	–58.8
300	0.639	–170.4	3.882	82.7	0.079	47.7	0.286	–61.0
400	0.632	–178.7	2.954	75.4	0.092	52.8	0.271	–65.2
500	0.628	174.6	2.405	68.8	0.107	57.4	0.273	–70.5
600	0.627	168.5	2.040	62.8	0.124	60.5	0.280	–76.9
700	0.626	162.9	1.778	57.4	0.143	62.9	0.296	–81.6
800	0.629	157.4	1.571	52.3	0.162	64.7	0.306	–87.9
900	0.631	152.7	1.405	47.9	0.185	64.8	0.318	–93.9
1000	0.633	148.0	1.292	43.7	0.209	64.8	0.339	–98.4

V_{CE}=5V, I_C=20mA, Z_O=50Ω

Freq (MHz)	$\|S_{11}\|$	$\angle S_{11}$	$\|S_{21}\|$	$\angle S_{21}$	$\|S_{12}\|$	$\angle S_{12}$	$\|S_{22}\|$	$\angle S_{22}$
100	0.653	–137.8	13.042	107.6	0.051	46.8	0.423	–68.5
200	0.608	–163.6	6.841	91.3	0.067	50.0	0.252	–84.4
300	0.591	–174.4	4.610	83.0	0.083	56.1	0.201	–91.5
400	0.584	178.4	3.504	76.4	0.102	59.2	0.186	–95.7
500	0.580	172.2	2.852	70.5	0.122	61.1	0.186	–100.2
600	0.579	166.7	2.427	65.3	0.144	62.2	0.195	–104.0
700	0.576	161.2	2.100	60.1	0.165	62.4	0.205	–107.4
800	0.576	156.1	1.871	55.5	0.186	62.3	0.215	–111.9
900	0.578	151.6	1.684	51.1	0.209	61.5	0.229	–115.4
1000	0.581	147.2	1.542	47.2	0.231	60.4	0.241	–118.7

V_{CE}=5V, I_C=50mA, Z_O=50Ω

Freq (MHz)	$\|S_{11}\|$	$\angle S_{11}$	$\|S_{21}\|$	$\angle S_{21}$	$\|S_{12}\|$	$\angle S_{12}$	$\|S_{22}\|$	$\angle S_{22}$
100	0.611	–147.0	14.987	104.6	0.047	51.3	0.371	–88.8
200	0.573	–168.9	7.700	90.4	0.066	57.3	0.241	–115.9
300	0.556	–177.8	5.174	83.1	0.088	61.8	0.205	–128.4
400	0.551	175.7	3.932	77.4	0.111	63.4	0.192	–135.3
500	0.545	169.9	3.202	72.0	0.136	63.8	0.190	–138.5
600	0.542	164.5	2.710	67.1	0.160	63.3	0.195	–140.7
700	0.540	159.3	2.347	62.7	0.184	62.3	0.200	–142.5
800	0.537	154.2	2.096	58.4	0.207	61.1	0.207	–144.8
900	0.540	149.9	1.882	54.4	0.230	59.4	0.215	–146.8
1000	0.541	145.6	1.729	50.5	0.254	57.9	0.223	–148.4

V_{CE}=5V, I_C=100mA, Z_O=50Ω

Freq (MHz)	$\|S_{11}\|$	$\angle S_{11}$	$\|S_{21}\|$	$\angle S_{21}$	$\|S_{12}\|$	$\angle S_{12}$	$\|S_{22}\|$	$\angle S_{22}$
100	0.606	–159.9	15.141	100.1	0.046	50.9	0.369	–102.2
200	0.572	–174.1	7.687	88.9	0.066	59.1	0.254	–129.7
300	0.558	179.3	5.186	82.6	0.090	63.0	0.223	–142.0
400	0.551	174.1	3.952	77.1	0.116	64.3	0.213	–148.5
500	0.542	168.6	3.229	72.1	0.141	64.4	0.210	–151.5
600	0.536	163.0	2.738	67.4	0.167	63.3	0.213	–153.0
700	0.531	157.4	2.375	62.6	0.192	62.0	0.219	–154.5
800	0.528	152.2	2.114	58.5	0.215	60.3	0.226	–156.5
900	0.529	147.7	1.900	54.8	0.239	58.5	0.234	–158.6
1000	0.530	143.5	1.737	51.1	0.262	57.0	0.239	–160.3