Ordering number : ENA1078

SANYO Semiconductors
DATA SHEET

An ON Semiconductor Company

NPN Epitaxial Planar Silicon Transistor

CPH6003A — High-frequency Medium-power Amplifier Applications

Features

- High gain (f_T=7GHz typ).
- High Current : (I_C=150mA).
- Ultraminiature and thin 6pin package.
- Large Collector Disspation (800mW).

Specifications

Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V_{CBO}		20	V
Collector-to-Emitter Voltage	V_{CEO}		12	V
Emitter-to-Base Voltage	V_{EBO}		2	V
Collector Current	I_C		150	mA
Collector Dissipation	P_C	When mounted on ceramic substrate (250mm²X0.8mm)	800	mW
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}=10V, I_E=0A			1.0	μA
Emitter Cutoff Current	I_{EBO}	V_{EB}=1V, I_C=0A			10	μA
DC Current Gain	h_{FE}	V_{CE}=5V, I_C=50mA	100		180	
Gain-Bandwidth Product	f_T	V_{CE}=5V, I_C=50mA		7		GHz

Marking : GC

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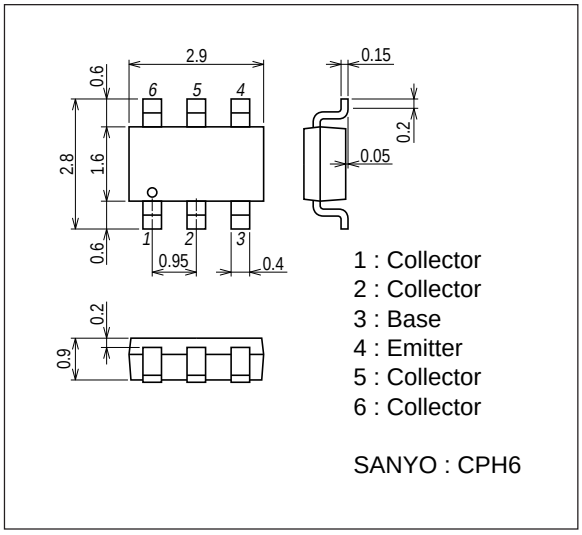
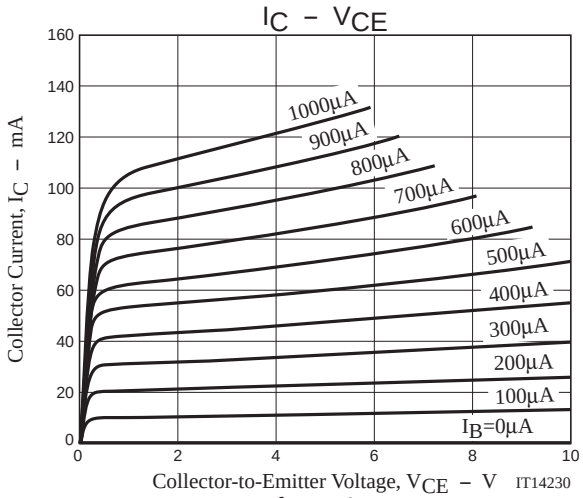
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Output Capacitance	Cob	V_{CB}=10V, f=1MHz		1.3	2.0	pF
Reverse Transfer Capacitance	Cre	V_{CB}=10V, f=1MHz		0.9		pF
Forward Transfer Gain	$\|S21e\|^2$	V_{CE}=5V, I_C=50mA, f=1GHz		9		dB
Noise Figure	NF	V_{CE}=5V, I_C=50mA, f=1GHz		1.8	3.0	dB

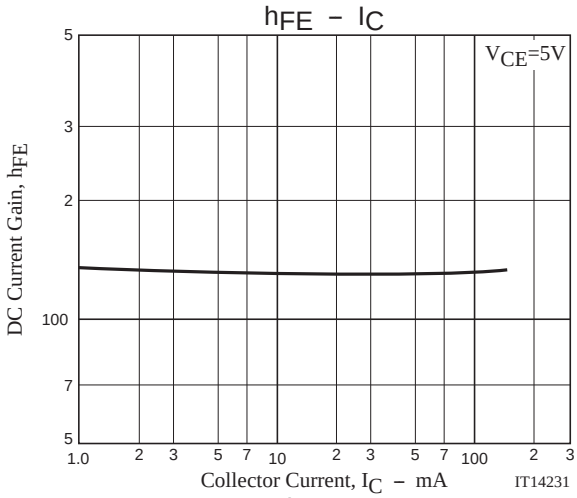
Package Dimensions

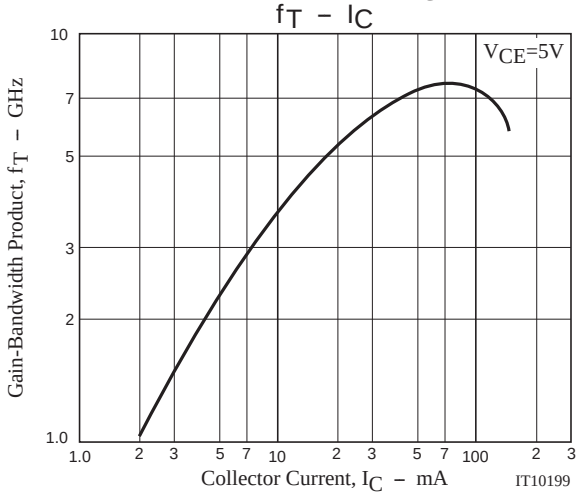
unit : mm (typ)

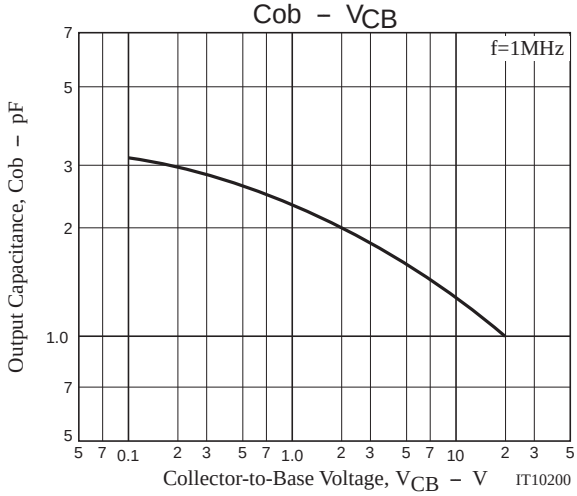
7018A-002

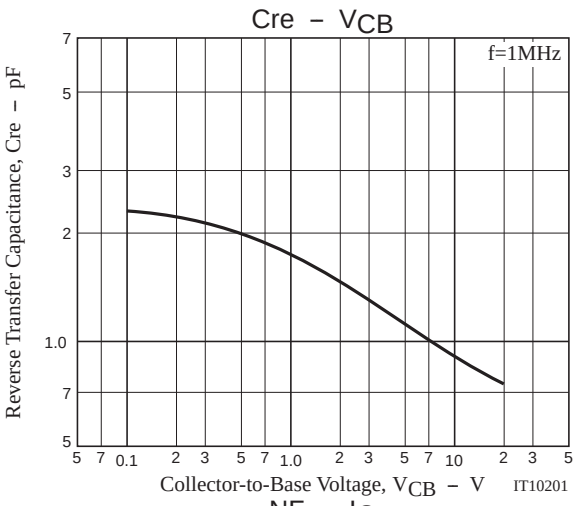


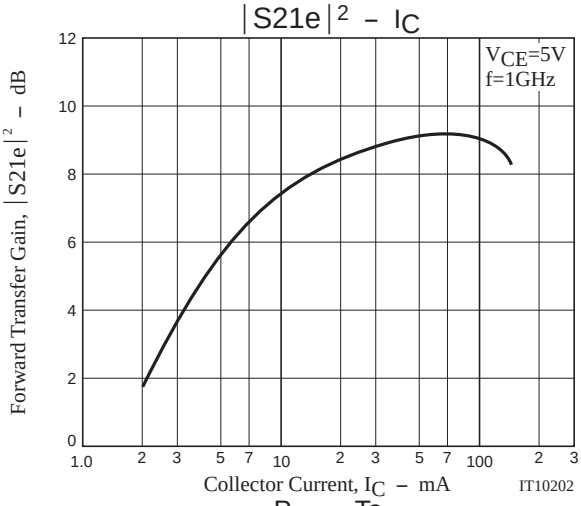


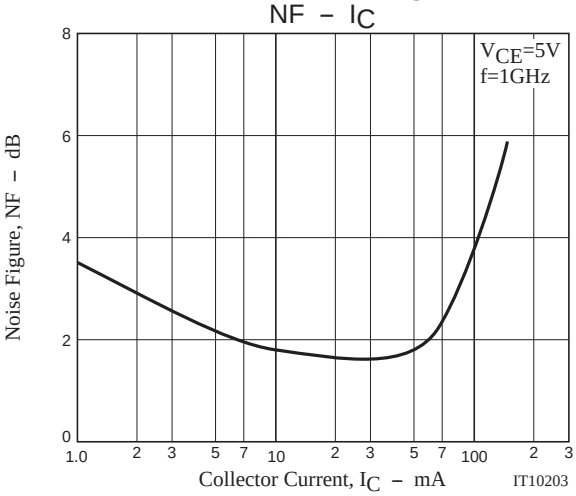


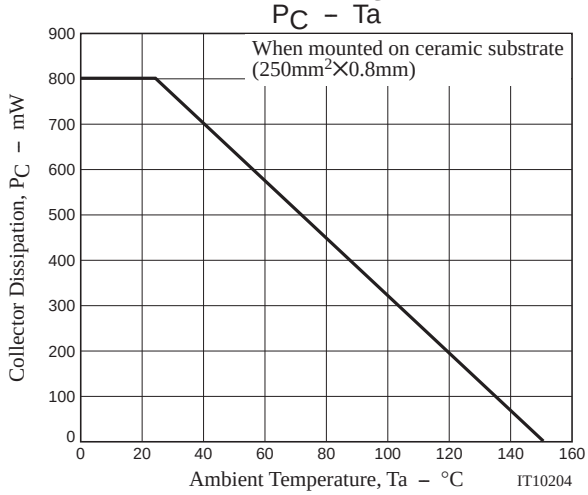





Cre – VCB
f=1MHz
Reverse Transfer Capacitance, Cre – pF
Collector-to-Base Voltage, VCB – V
IT10201


|S21e|2 – IC
VCE=5V
f=1GHz
Forward Transfer Gain, |S21e|2 – dB
Collector Current, IC – mA
IT10202


NF – IC
VCE=5V
f=1GHz
Noise Figure, NF – dB
Collector Current, IC – mA
IT10203


PC – Ta
When mounted on ceramic substrate
(250mm2×0.8mm)
Collector Dissipation, PC – mW
Ambient Temperature, Ta – °C
IT10204

S Parameters (Common emitter)

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	0.550	254.1	21.532	119.9	0.036	54.6	0.527	-62.8
200	0.492	218.1	12.273	103.0	0.050	56.5	0.332	-80.3
300	0.477	201.9	8.448	95.3	0.063	61.7	0.267	-88.3
400	0.470	192.4	6.427	90.4	0.078	65.3	0.242	268.1
500	0.518	181.0	5.015	86.8	0.089	68.2	0.217	245.3
600	0.513	175.8	4.221	83.9	0.104	70.2	0.216	245.8
700	0.510	171.5	3.658	81.3	0.120	71.7	0.214	247.2
800	0.508	167.6	3.234	78.9	0.135	72.7	0.220	249.3
900	0.503	163.7	2.900	76.7	0.150	73.2	0.225	251.3
1000	0.497	160.1	2.636	74.4	0.166	73.7	0.231	254.6
1100	0.493	156.8	2.419	72.5	0.181	73.9	0.239	256.3
1200	0.489	153.4	2.243	70.5	0.196	74.1	0.247	258.8

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	0.465	231.1	25.203	111.9	0.029	59.2	0.413	-79.9
200	0.449	203.4	13.519	98.7	0.045	65.7	0.269	259.6
300	0.445	191.6	9.177	92.7	0.061	70.4	0.230	250.7
400	0.443	184.2	6.947	88.8	0.078	72.8	0.218	247.3
500	0.502	175.0	5.407	86.1	0.092	74.7	0.231	224.3
600	0.497	170.3	4.550	83.7	0.110	75.6	0.229	225.5
700	0.494	166.4	3.944	81.5	0.127	76.2	0.225	227.1
800	0.490	162.8	3.483	79.4	0.144	76.4	0.228	229.9
900	0.485	159.1	3.127	77.4	0.161	76.2	0.230	232.4
1000	0.478	155.5	2.845	75.5	0.178	76.1	0.230	236.1
1100	0.473	152.3	2.608	73.6	0.195	75.9	0.236	238.6
1200	0.468	149.0	2.423	71.9	0.211	75.5	0.239	242.0

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	0.451	219.5	25.808	108.5	0.026	62.4	0.359	-86.7
200	0.448	196.7	13.593	96.8	0.043	69.8	0.240	253.1
300	0.448	187.0	9.193	91.4	0.060	73.8	0.212	244.9
400	0.446	180.7	6.953	87.8	0.078	75.5	0.205	242.3
500	0.508	172.6	5.408	85.5	0.093	76.9	0.228	219.9
600	0.503	168.3	4.550	83.1	0.110	77.5	0.226	221.5
700	0.500	164.6	3.944	81.0	0.128	77.8	0.223	223.4
800	0.497	161.2	3.480	79.0	0.145	77.8	0.226	226.5
900	0.490	157.6	3.132	77.0	0.163	77.4	0.228	229.1
1000	0.484	154.2	2.842	75.0	0.180	77.1	0.227	233.1
1100	0.479	151.0	2.614	73.3	0.197	76.7	0.232	235.8
1200	0.473	147.8	2.423	71.6	0.214	76.3	0.236	239.3