



SANYO Semiconductors

# DATA SHEET

An ON Semiconductor Company

TR : NPN Epitaxial Planar Silicon Transistor

FET : N-Channel Silicon Junction FET

## CPH5901 — High-Frequency Amplifier. AM Amplifier. Low-Frequency Amplifier Applications

### Features

- Composite type with J-FET and NPN transistors contained in the CPH5 package, improving the mounting efficiency greatly.
- The CPH5901 is formed with two chips, being equivalent to the 2SK932 and the other the 2SC4639, placed in one package.
- Common drain and emitter.

### Specifications

Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
[FET]				
Drain-to-Source Voltage	V <sub>DSX</sub>		15	V
Gate-to-Drain Voltage	V <sub>GD</sub>		-15	V
Gate Current	I <sub>G</sub>		10	mA
Drain Current	I <sub>D</sub>		50	mA
Allowable Power Dissipation	P <sub>D</sub>	Mounted on a ceramic board (600mm <sup>2</sup> ×0.8mm)	350	mW
[TR]				
Collector-to-Base Voltage	V <sub>CB</sub>		55	V
Collector-to-Emitter Voltage	V <sub>CE</sub>		50	V
Emitter-to-Base Voltage	V <sub>EB</sub>		6	V
Collector Current	I <sub>C</sub>		150	mA
Collector Current (Pulse)	I <sub>CP</sub>		300	mA
Base Current	I <sub>B</sub>		30	mA
Collector Dissipation	P <sub>C</sub>	Mounted on a ceramic board (600mm <sup>2</sup> ×0.8mm)	350	mW
[Common Ratings]				
Total Dissipation	P <sub>T</sub>	Mounted on a ceramic board (600mm <sup>2</sup> ×0.8mm)	500	mW
Junction Temperature	T <sub>J</sub>		150	°C
Storage Temperature	T <sub>stg</sub>		-55 to +150	°C

Marking : 1A

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**SANYO Electric Co., Ltd. Semiconductor Company**

TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110-8534 JAPAN

# CPH5901

## Electrical Characteristics at Ta=25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
[FET]						
Gate-to-Drain Breakdown Voltage	$V_{(BR)GDS}$	$I_G = -10\mu A, V_{DS} = 0V$	-15			V
Gate Cutoff Current	$I_{GSS}$	$V_{GS} = -10V, V_{DS} = 0V$			-1.0	nA
Cutoff Voltage	$V_{GS(off)}$	$V_{DS} = 5V, I_D = 100\mu A$	-0.2	-0.6	-1.4	V
Drain Current	$I_{DSS}$	$V_{DS} = 5V, V_{GS} = 0V$	6.0*		20.0*	mA
Forward Transfer Admittance	$ y_{fs} $	$V_{DS} = 5V, V_{GS} = 0V, f = 1kHz$	25	50		mS
Input Capacitance	$C_{iss}$	$V_{DS} = 5V, V_{GS} = 0V, f = 1MHz$		10		pF
Reverse Transfer Capacitance	$C_{rss}$	$V_{DS} = 5V, V_{GS} = 0V, f = 1MHz$		3.0		pF
Noise Figure	NF	$V_{DS} = 5V, R_g = 1k\Omega, I_D = 1mA, f = 1kHz$		1.5		dB
[TR]						
Collector Cutoff Current	$I_{CBO}$	$V_{CB} = 35V, I_E = 0A$			0.1	$\mu A$
Emitter Cutoff Current	$I_{EBO}$	$V_{EB} = 4V, I_C = 0A$			0.1	$\mu A$
DC Current Gain	$h_{FE}$	$V_{CE} = 6V, I_C = 1mA$	135		400	
Gain-Bandwidth Product	$f_T$	$V_{CE} = 6V, I_C = 10mA$		200		MHz
Output Capacitance	$C_{ob}$	$V_{CB} = 6V, f = 1MHz$		1.7		pF
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 50mA, I_B = 5mA$		0.08	0.4	V
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = 50mA, I_B = 5mA$		0.8	1.0	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = 10\mu A, I_E = 0A$	55			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = 1mA, R_{BE} = \infty$	50			V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E = 10\mu A, I_C = 0A$	6			V
Turn-ON Time	$t_{on}$	See specified Test Circuit.		0.15		$\mu s$
Storage Time	$t_{stg}$	See specified Test Circuit.		0.75		$\mu s$
Fall Time	$t_f$	See specified Test Circuit.		0.20		$\mu s$

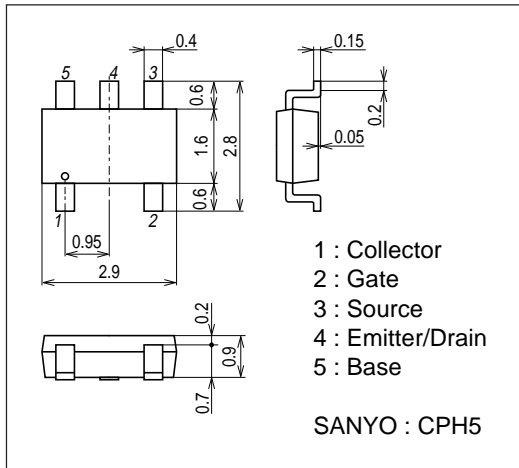
\* : The CPH5901 is classified by  $I_{DSS}$  as follows : (unit : mA)

Rank	F	G
$I_{DSS}$	6.0 to 12.0	10.0 to 20.0

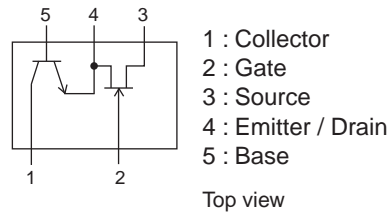
### Package Dimensions

unit : mm

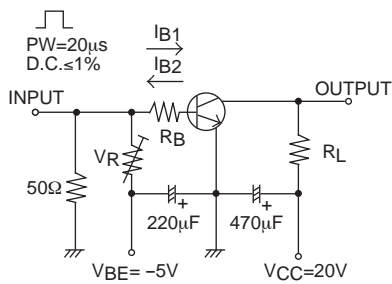
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### Electrical Connection

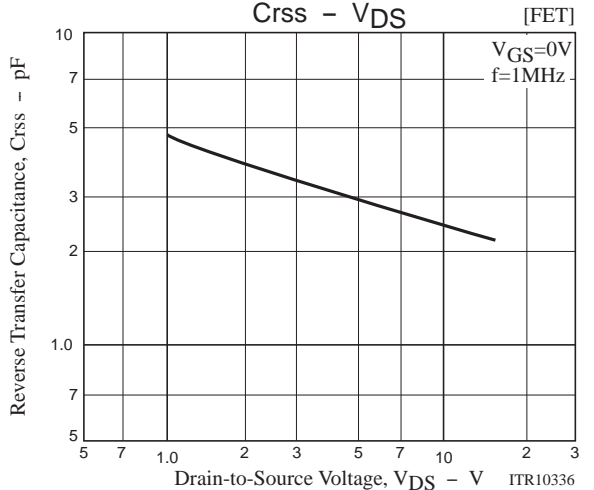
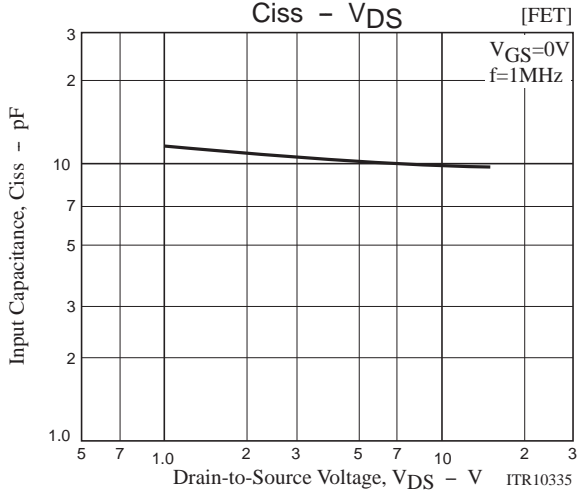
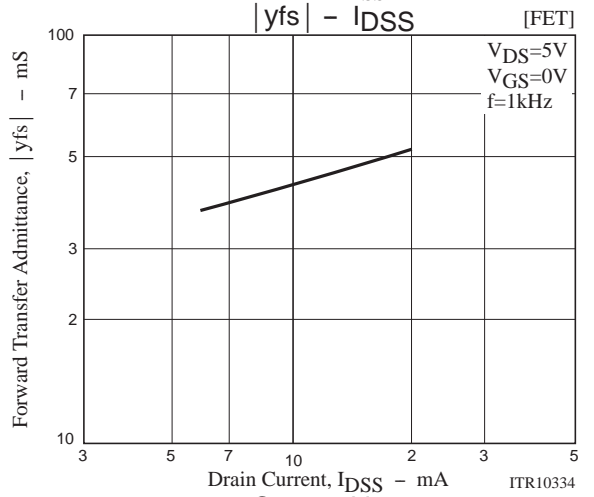
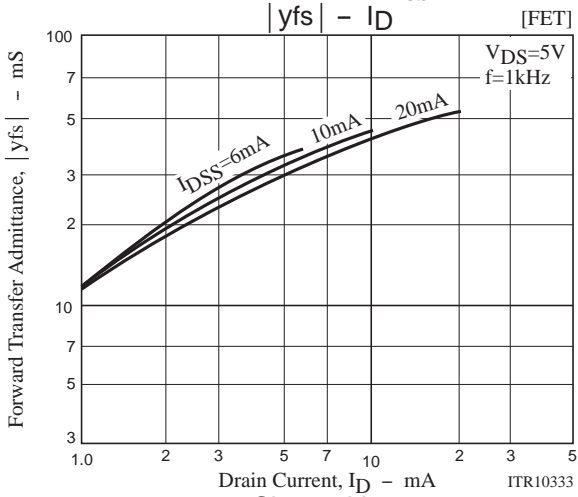
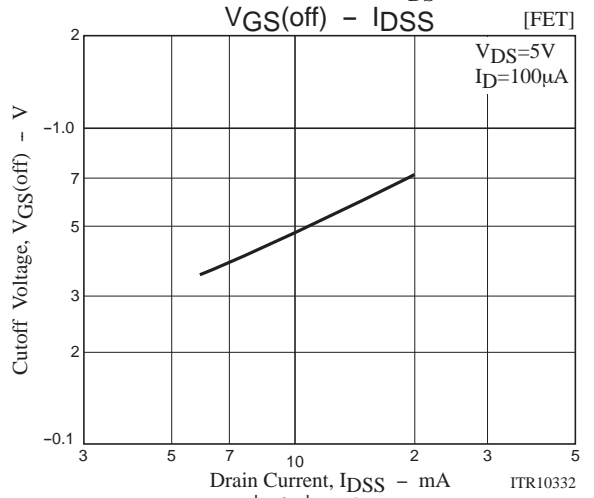
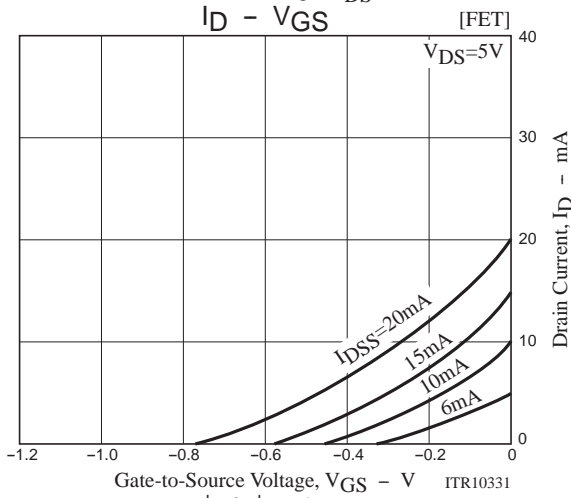
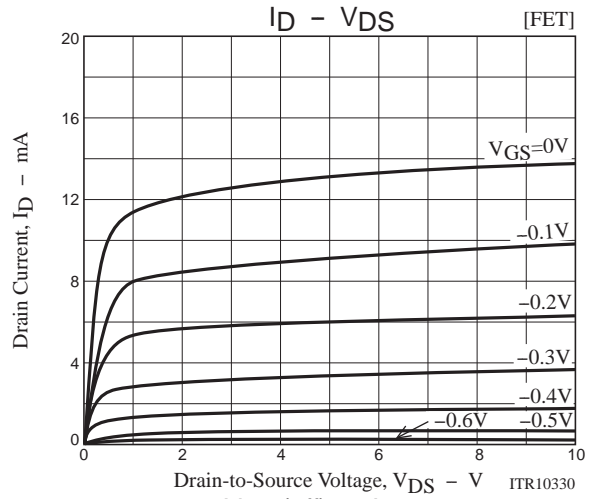
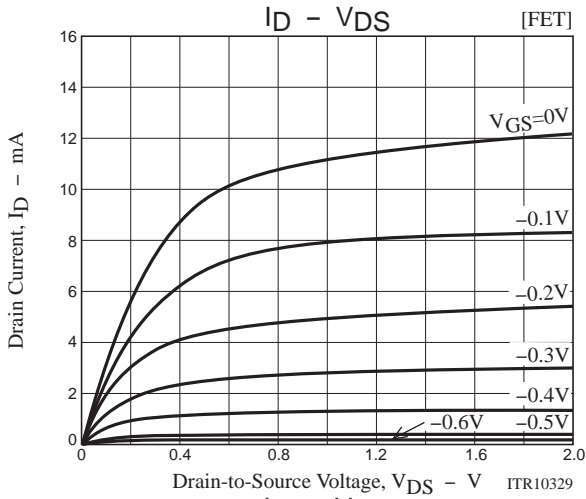


### Switching Time Test Circuit

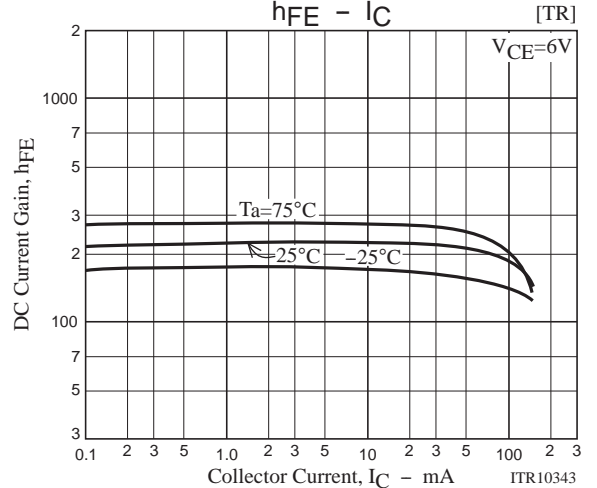
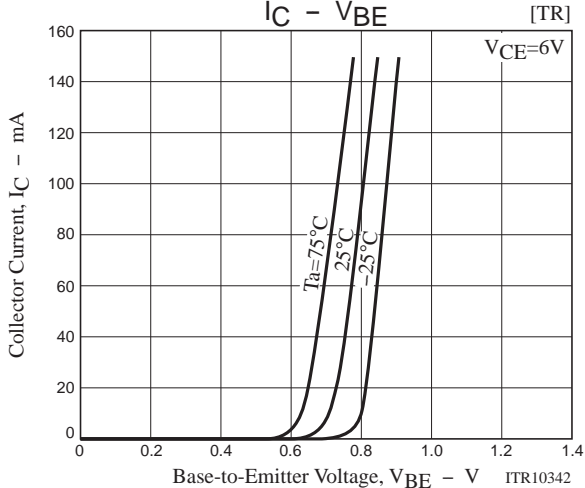
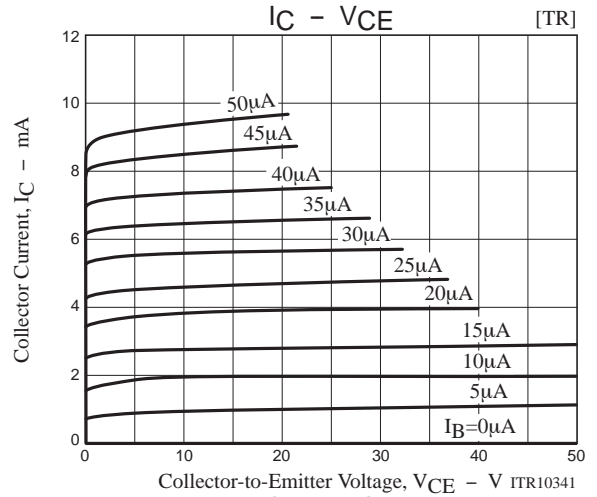
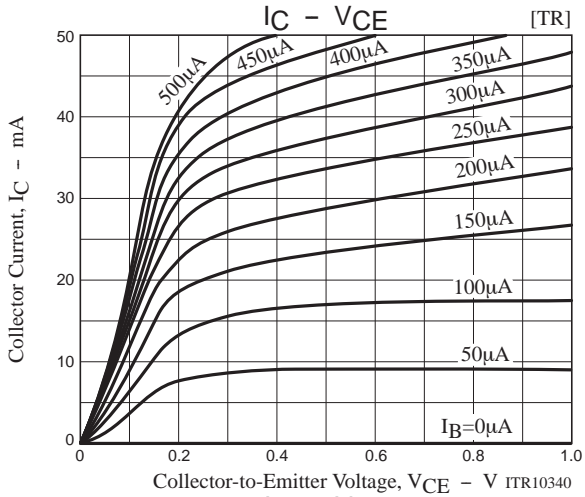
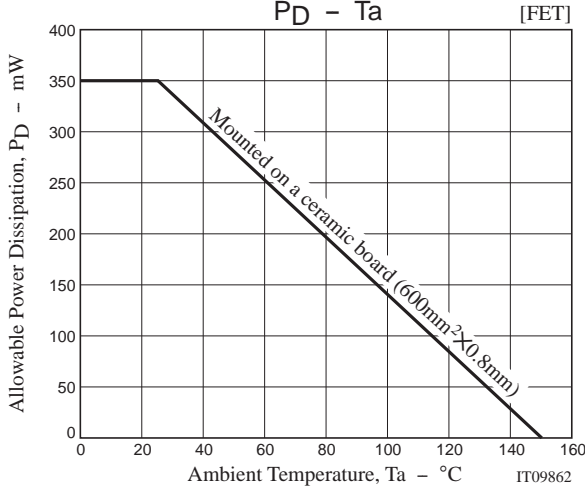
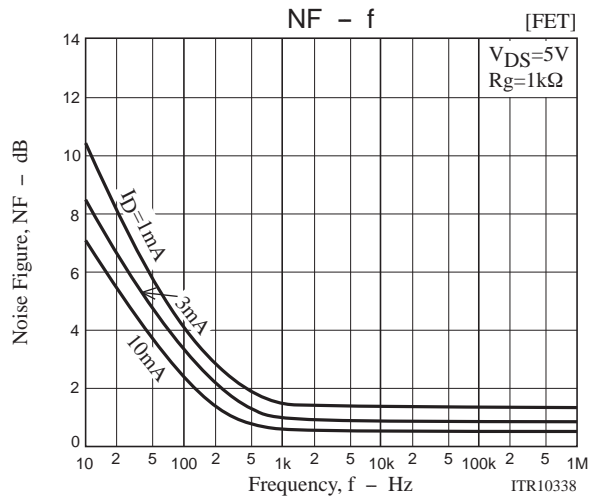
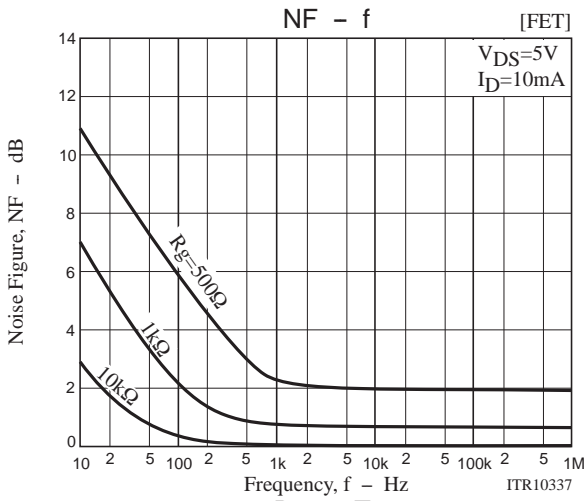


$$10I_{B1} = -10I_{B2} = I_C = 10mA$$

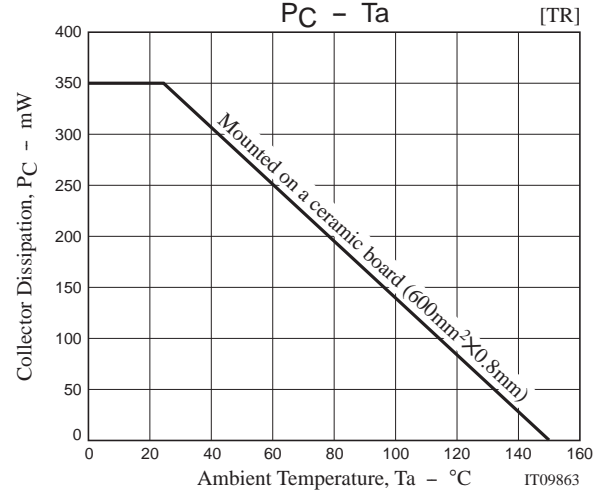
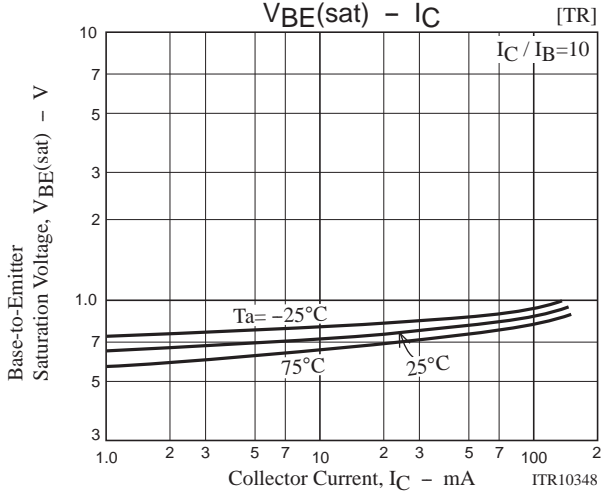
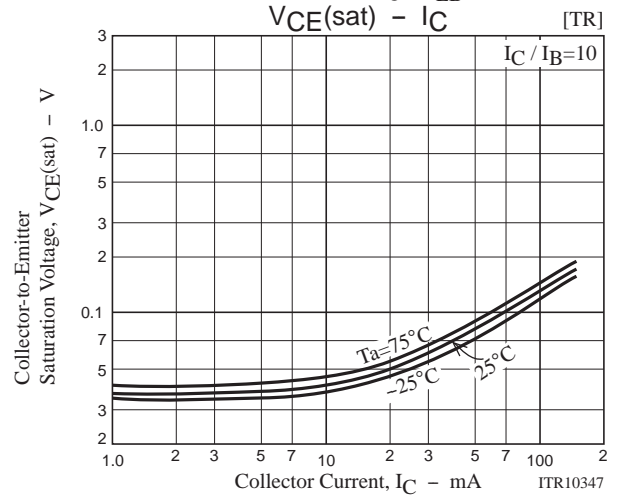
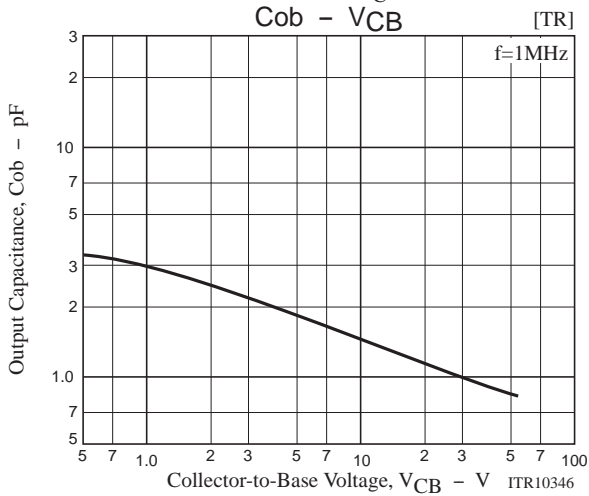
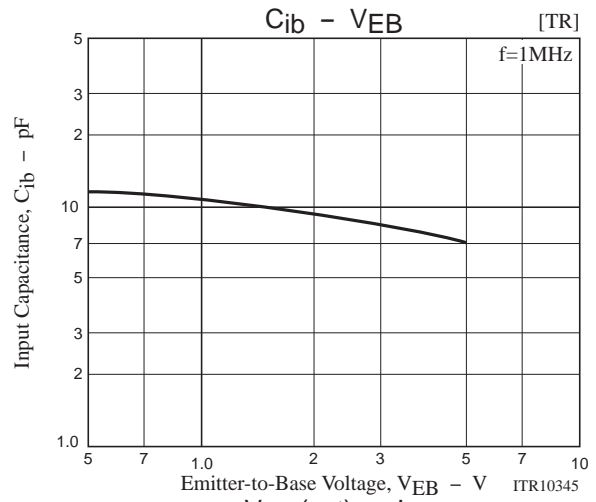
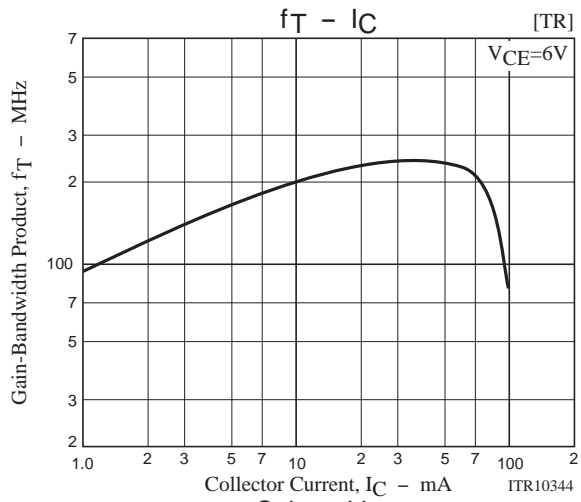
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