



SANYO Semiconductors

# DATA SHEET

An ON Semiconductor Company

NPN Epitaxial Planar Silicon Transistor  
N-Channel Silicon Junction FET

## CPH5905 — 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 CPH5905 contains a 2SK3557-equivalent chip and a 2SC4639-equivalent chip in one package.
- Drain and emitter are shared.

### Specifications

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

Parameter	Symbol	Conditions	Ratings	Unit
[FET]				
Drain-to-Source Voltage	$V_{DSX}$		15	V
Gate-to-Drain Voltage	$V_{GD}$		-15	V
Gate Current	$I_G$		10	mA
Drain Current	$I_D$		50	mA
Allowable Power Dissipation	PD	Mounted on a ceramic board (600mm <sup>2</sup> X0.8mm)	350	mW
[TR]				
Collector-to-Base Voltage	$V_{CBO}$		55	V
Collector-to-Emitter Voltage	$V_{CEO}$		50	V
Emitter-to-Base Voltage	$V_{EBO}$		6	V
Collector Current	$I_C$		150	mA
Collector Current (Pulse)	$I_{CP}$		300	mA
Base Current	$I_B$		30	mA
Collector Dissipation	PC	Mounted on a ceramic board (600mm <sup>2</sup> X0.8mm)	350	mW
[Common Ratings]				
Total Dissipation	$P_T$	Mounted on a ceramic board (600mm <sup>2</sup> X0.8mm)	500	mW
Junction Temperature	$T_J$		150	°C
Storage Temperature	$T_{stg}$		-55 to +150	°C

Marking : 1E

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# CPH5905

## 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	$V_{GS(off)}$	$V_{DS} = 5V, I_D = 100\mu A$	-0.4	-0.7	-1.5	V
Drain Current	$I_{DSS}$	$V_{DS} = 5V, V_{GS} = 0V$	10.0*		32.0*	mA
Forward Transfer Admittance	$ y_{fs} $	$V_{DS} = 5V, V_{GS} = 0V, f = 1kHz$	24	35		mS
Input Capacitance	$C_{iss}$	$V_{DS} = 5V, V_{GS} = 0V, f = 1MHz$		10.0		pF
Reverse Transfer Capacitance	$C_{rss}$	$V_{DS} = 5V, V_{GS} = 0V, f = 1MHz$		2.9		pF
Noise Figure	NF	$V_{DS} = 5V, R_g = 1k\Omega, I_D = 1mA, f = 1kHz$		1.0		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 CPH5905 is classified by  $I_{DSS}$  as follows : (unit : mA)

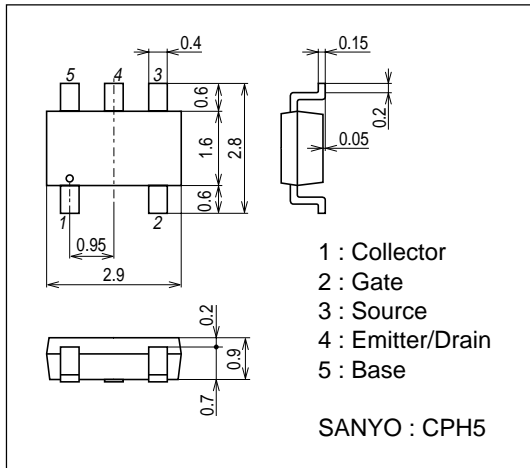
Rank	G	H
$I_{DSS}$	10.0 to 20.0	16.0 to 32.0

The specifications shown above are for each individual FET or a transistor.

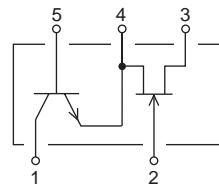
### Package Dimensions

unit : mm

7017-007



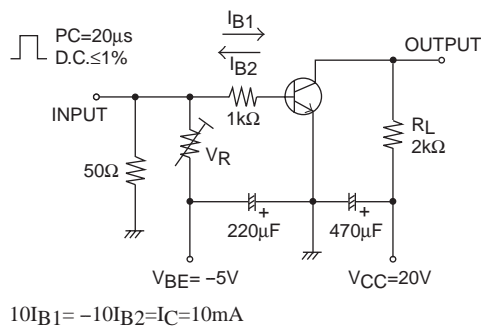
### Electrical Connection



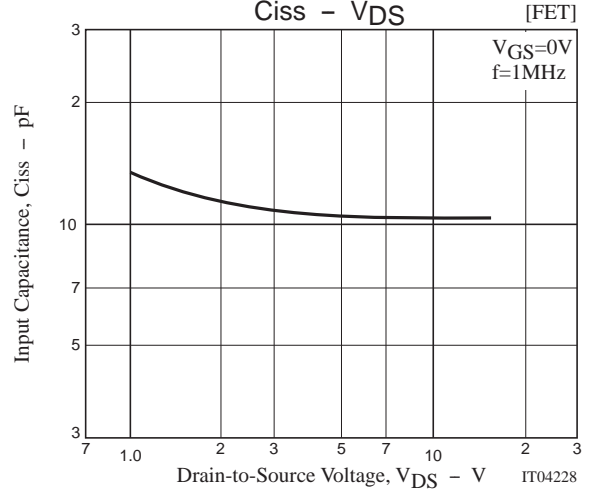
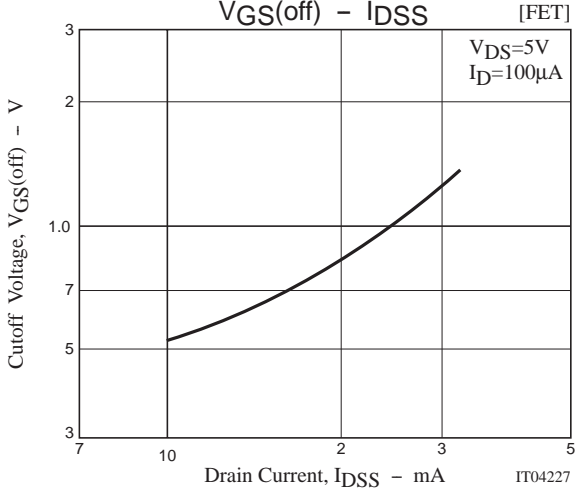
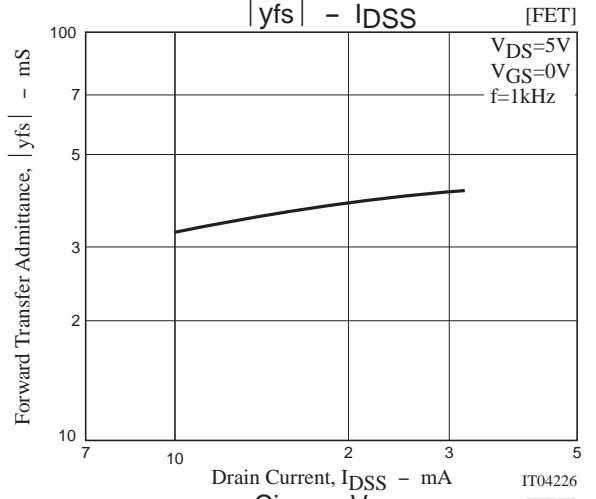
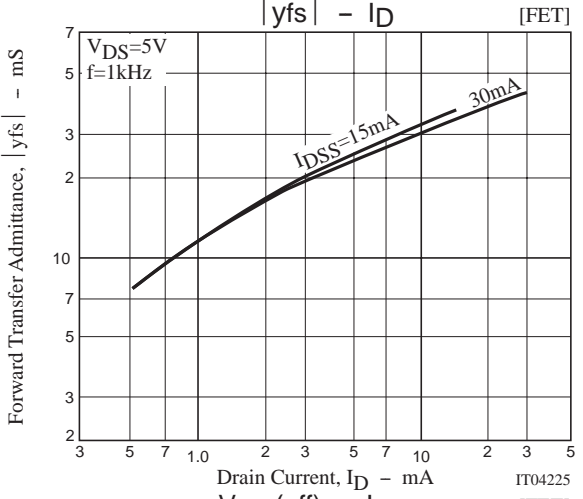
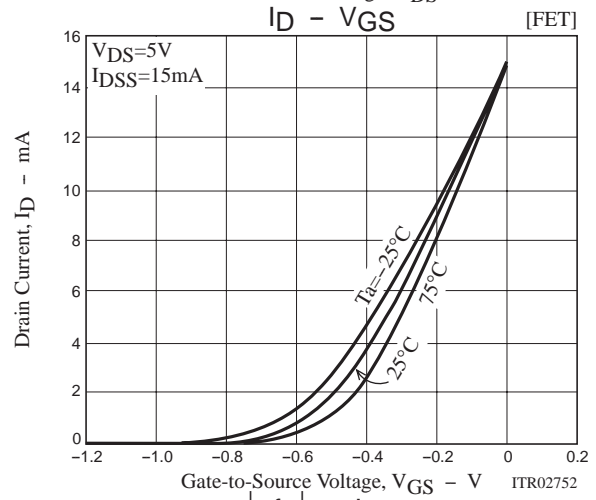
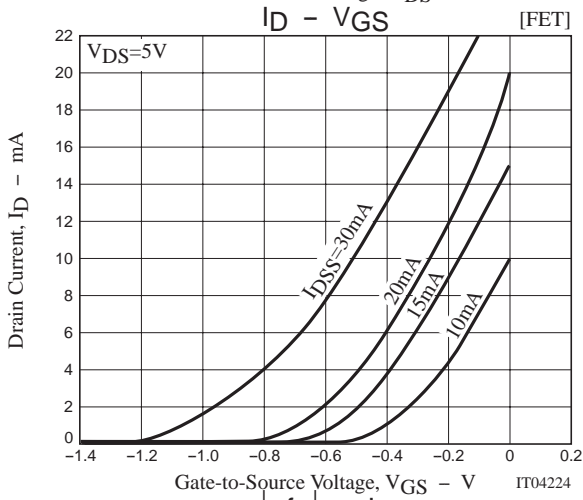
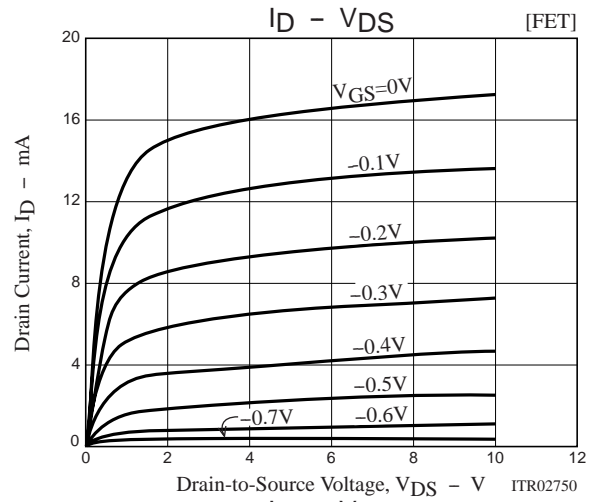
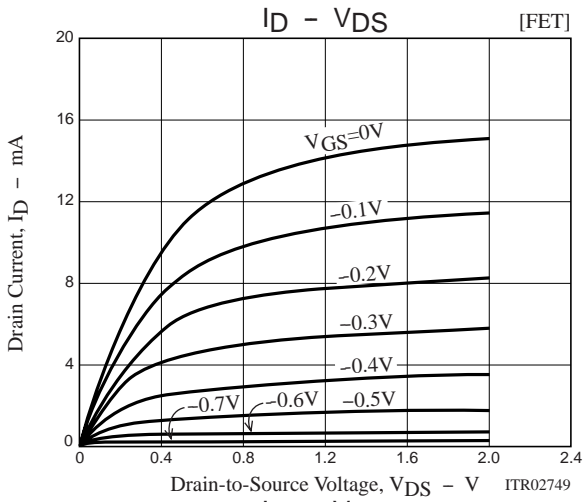
- 1 : Collector
- 2 : Gate
- 3 : Source
- 4 : Emitter/Drain
- 5 : Base

Top view

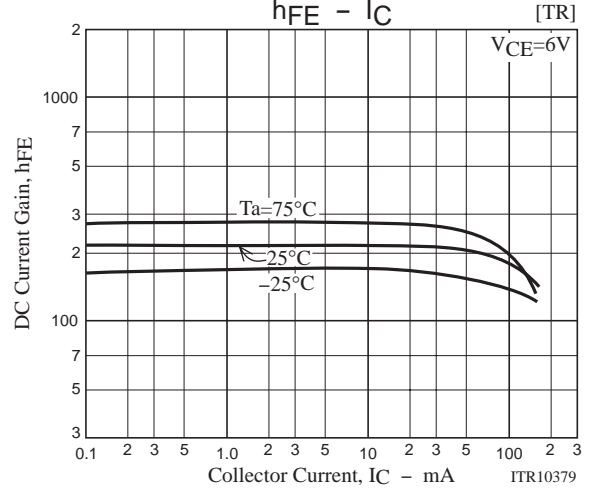
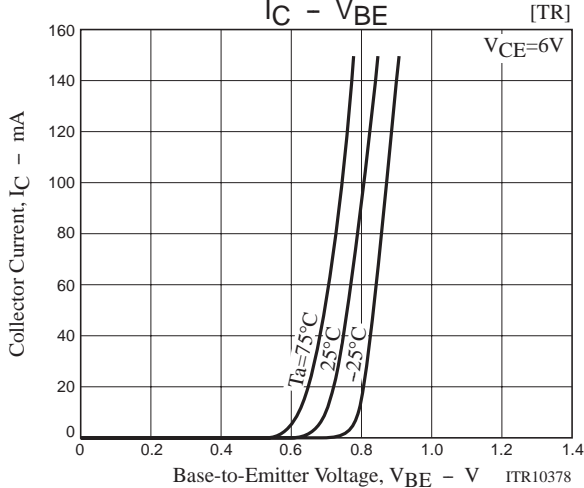
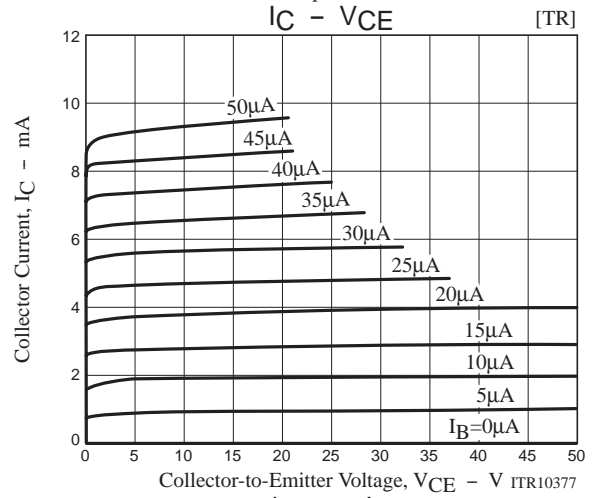
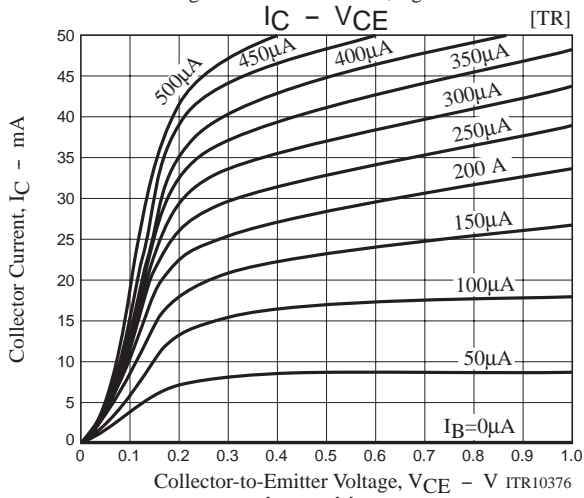
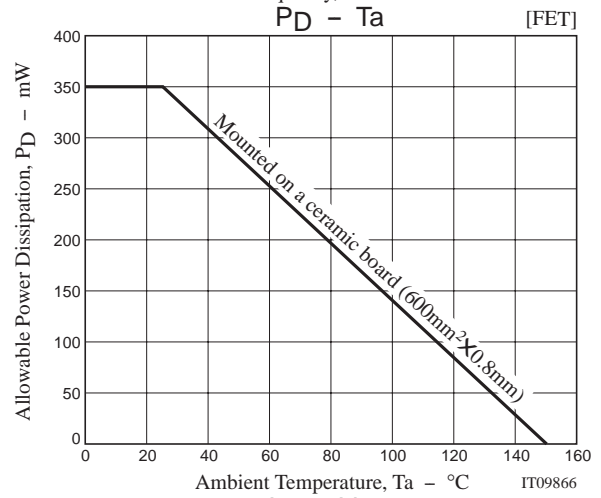
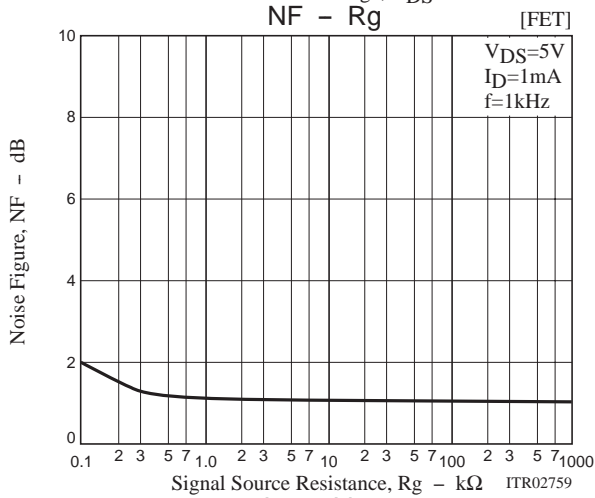
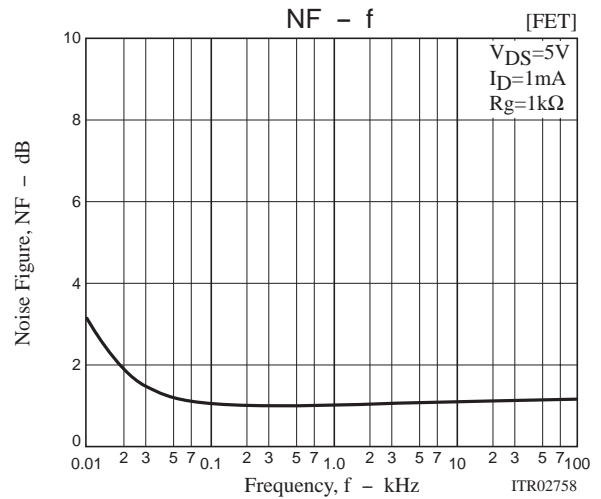
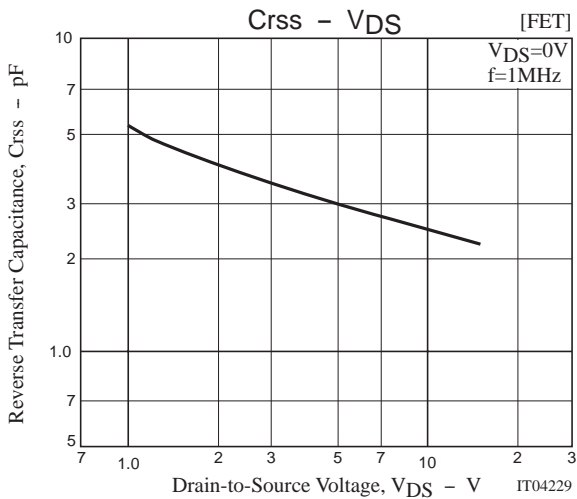
### Switching Time Test Circuit



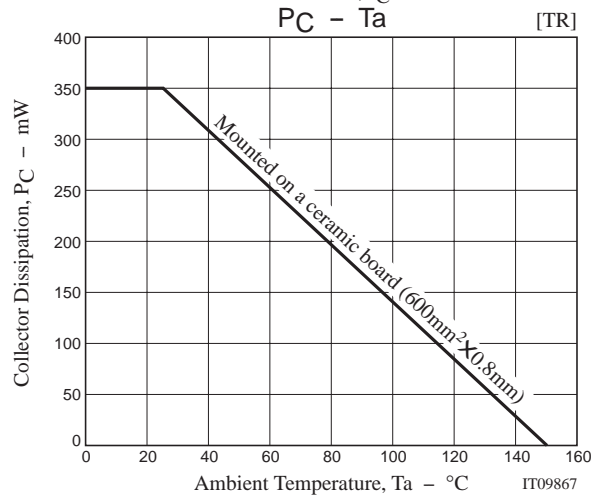
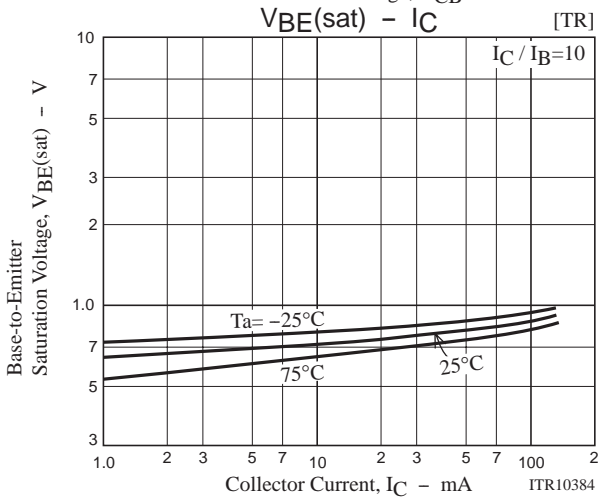
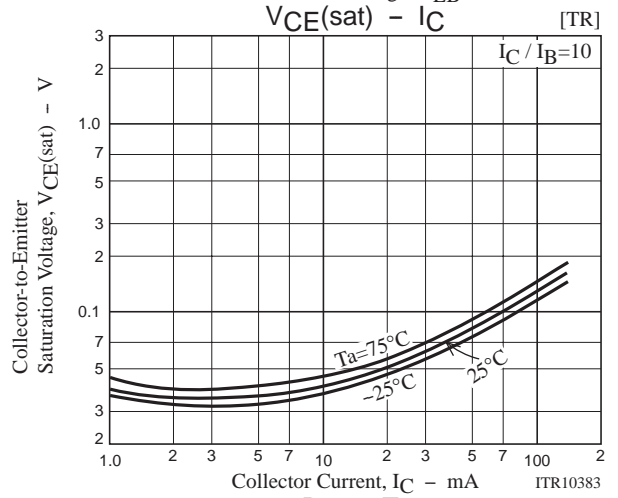
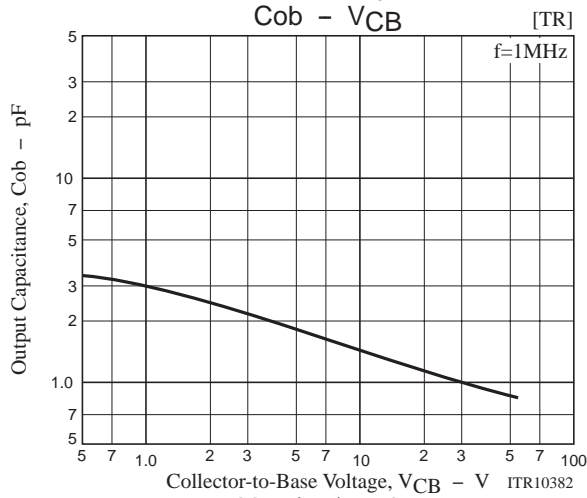
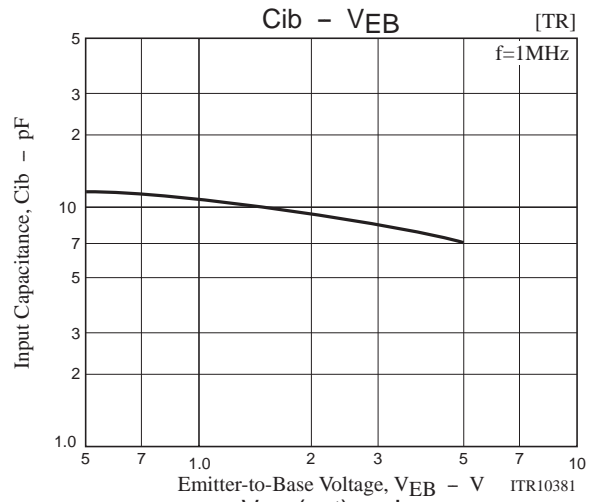
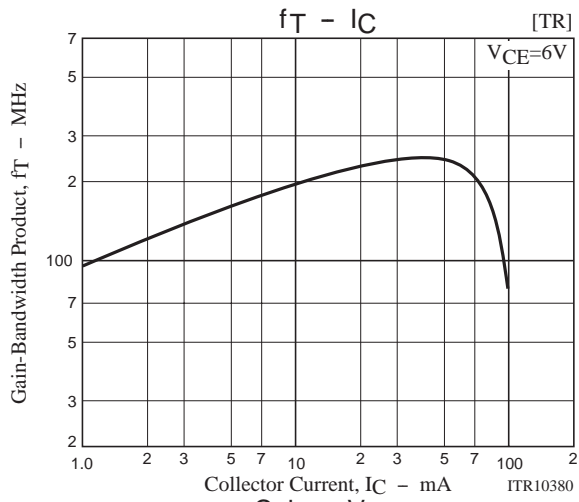
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