



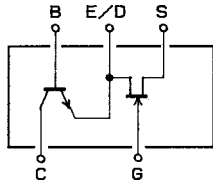
# FC12

TR:NPN Epitaxial Planar Silicon Transistor  
 FET:N-Channel Junction Silicon Transistor  
**High-Frequency Amp, AM Applications,  
 Low-Frequency Amp**

## Features

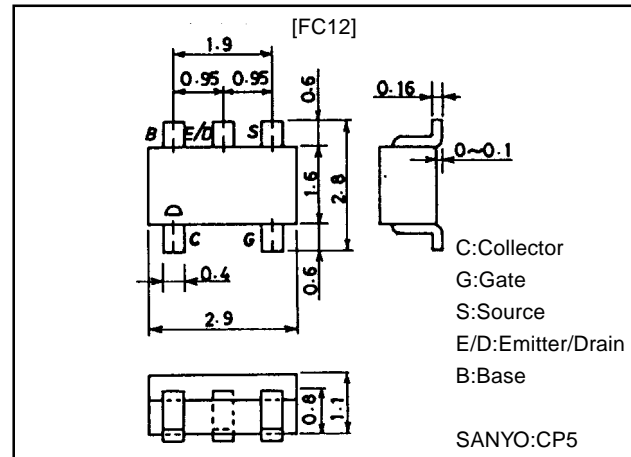
- Composite type with 2 transistors contained in the CP package currently in use, improving the mounting efficiency greatly.
- The FC12 is formed with two chips, being equivalent to the 2SC4639, placed in one package.
- Common drain and emitter.

## Electrical Connection

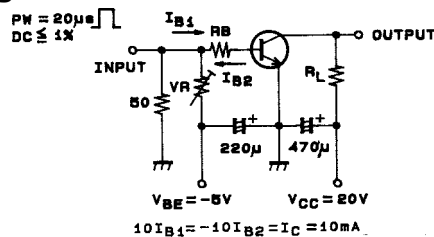


## Package Dimensions

unit:mm  
2075



## Switching Time Test Circuit



## Specifications

### Absolute Maximum Ratings at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
[FET]				
Drain-to-Source Voltage	$V_{DSX}$		15	V
Gate-to-Drain Voltage	$V_{GDS}$		-15	V
Gate Current	$I_G$		10	mA
Drain Current	$I_D$		50	mA
Allowable Power Dissipation	$P_D$		200	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	$P_C$		200	mW
[Common Ratings]				
Total Dissipation	PT		300	mW
Junction Temperature	$T_j$		150	°C
Storage Temperature	$T_{stg}$		-55 to +150	°C

Marking:12

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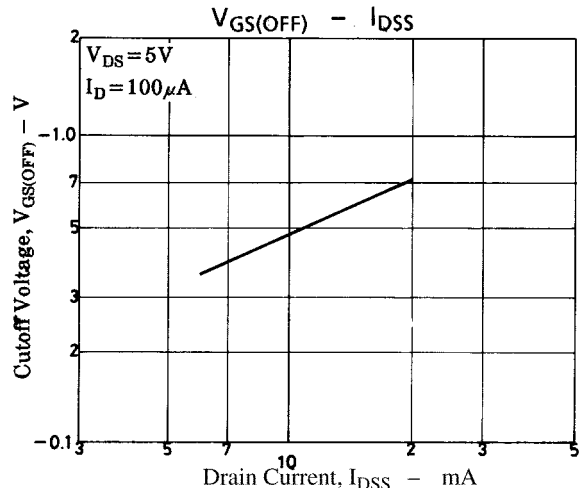
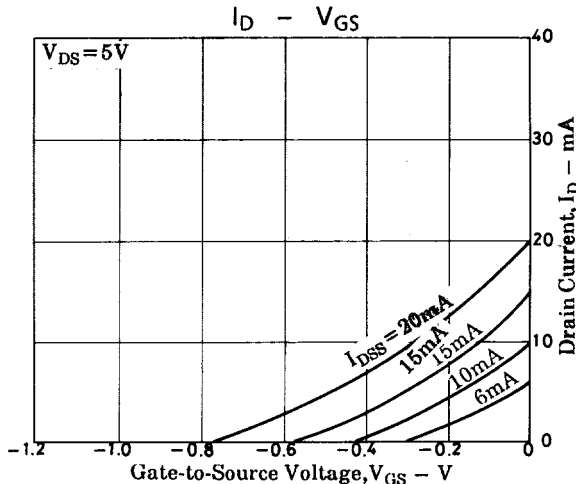
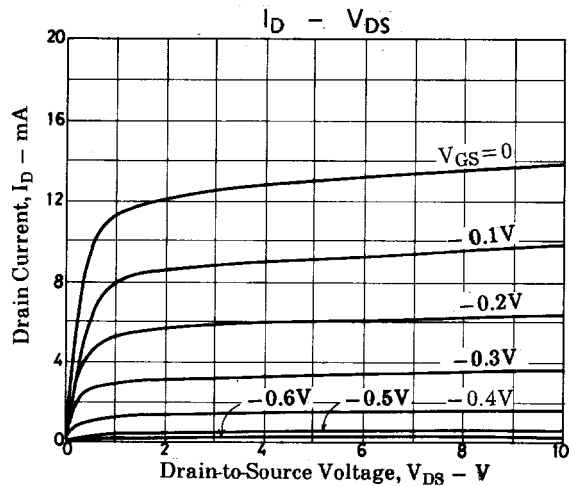
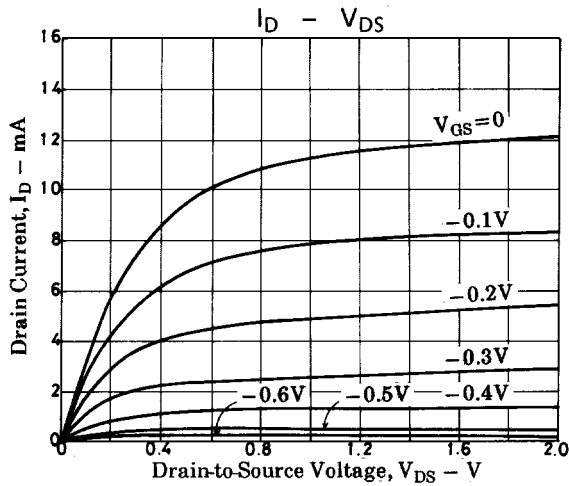
## Electrical Characteristics at $T_a = 25^\circ\text{C}$

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

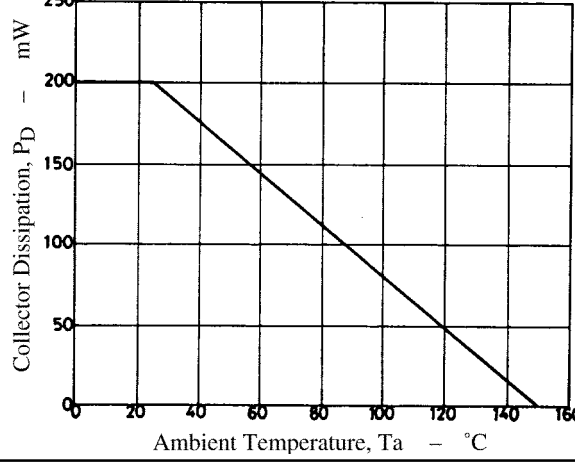
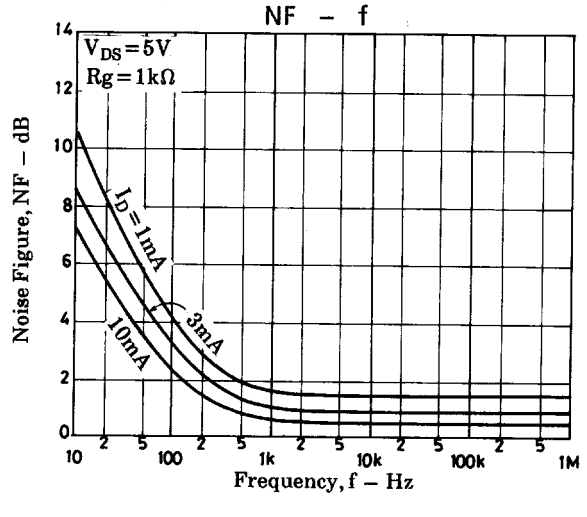
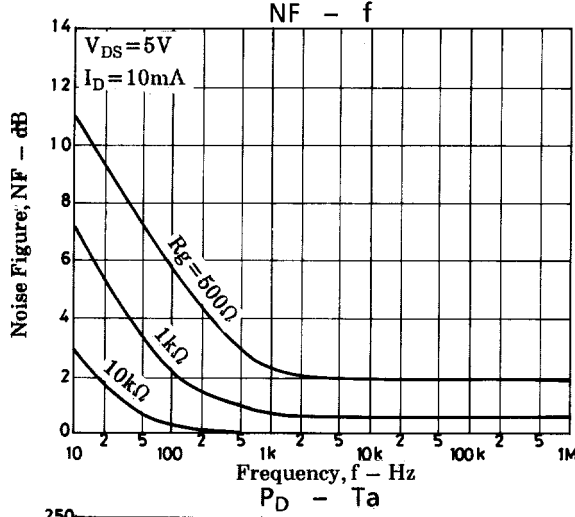
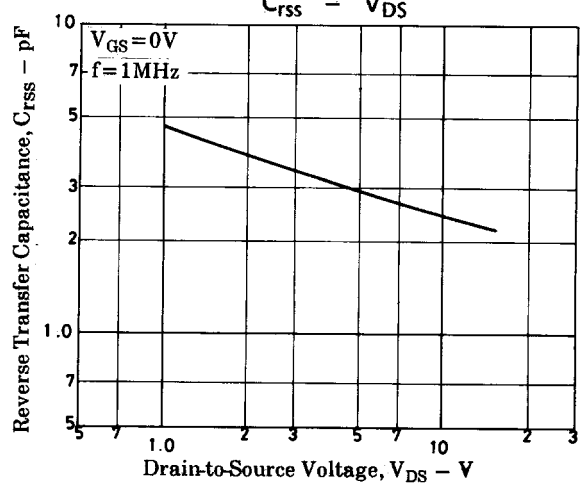
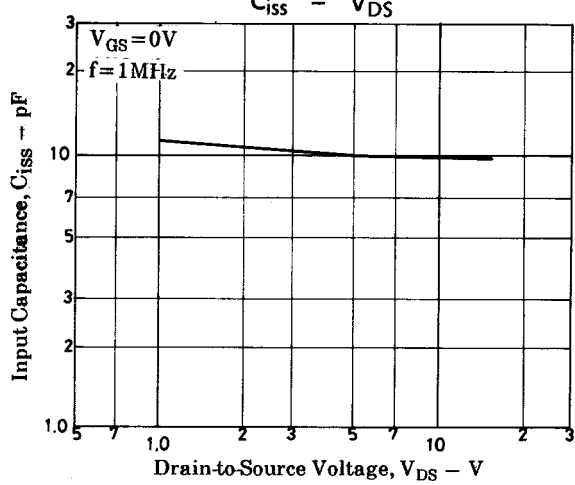
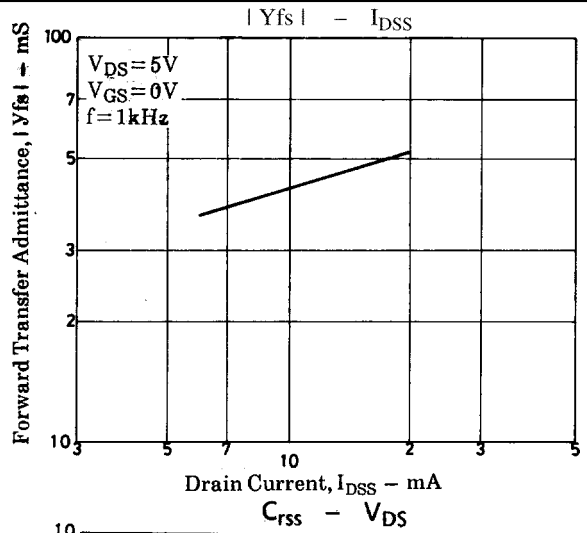
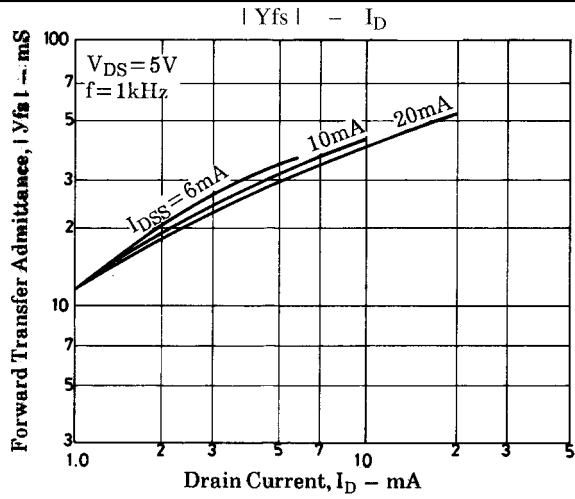
Note\*: The FC12 is classified by  $I_{DSS}$  as follows : (unit: mA).

6.0 F	12.0	10.0 G	20.0
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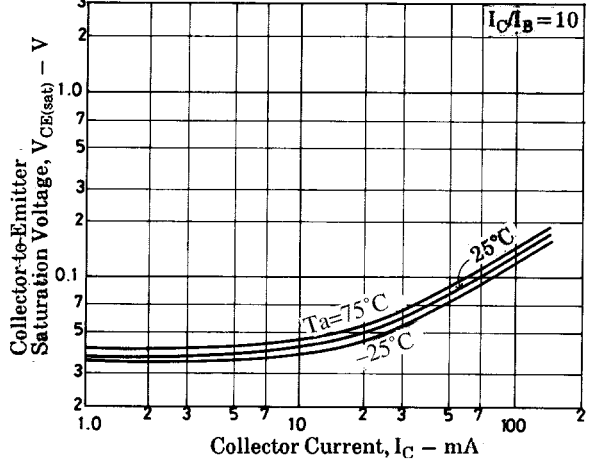
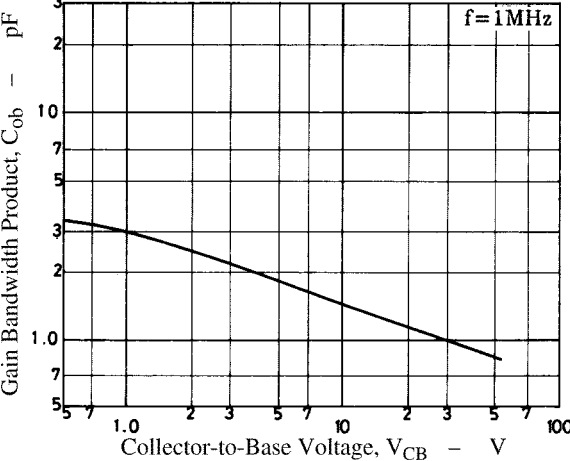
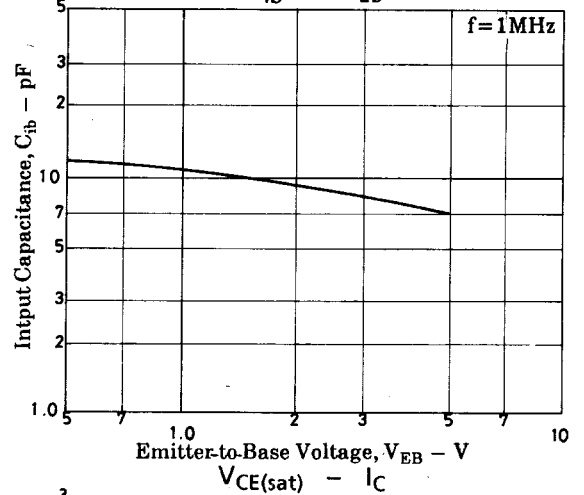
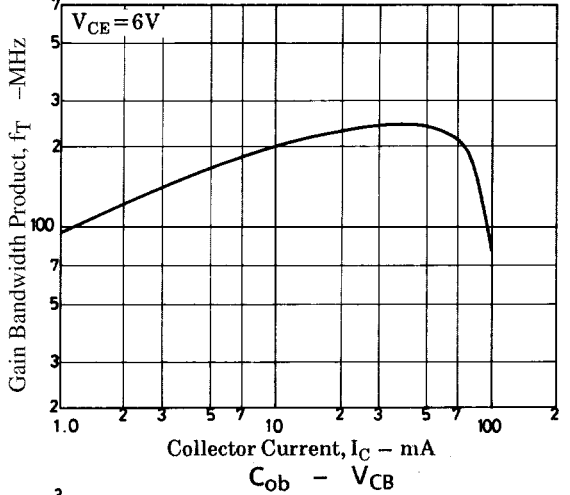
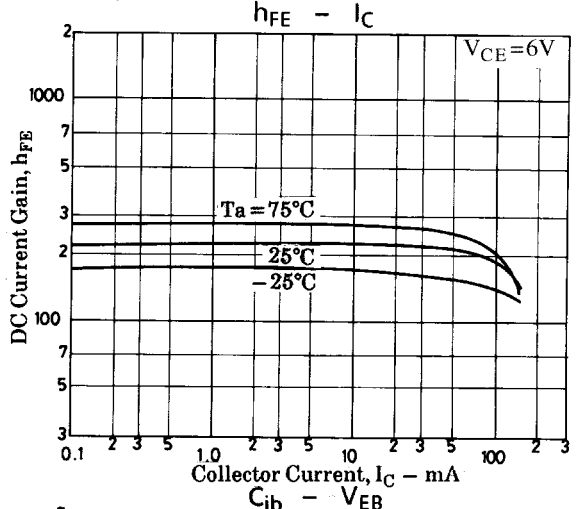
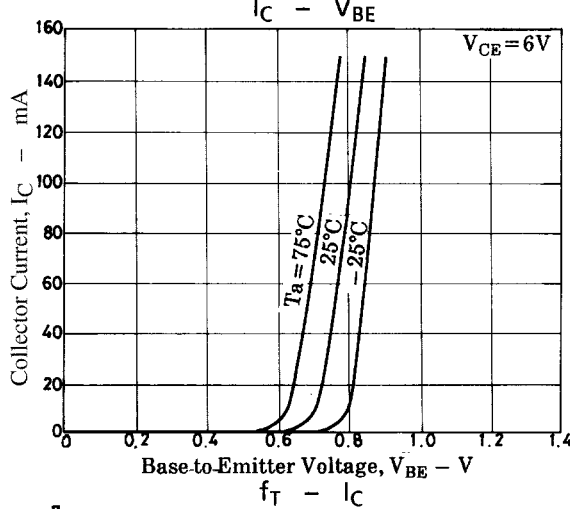
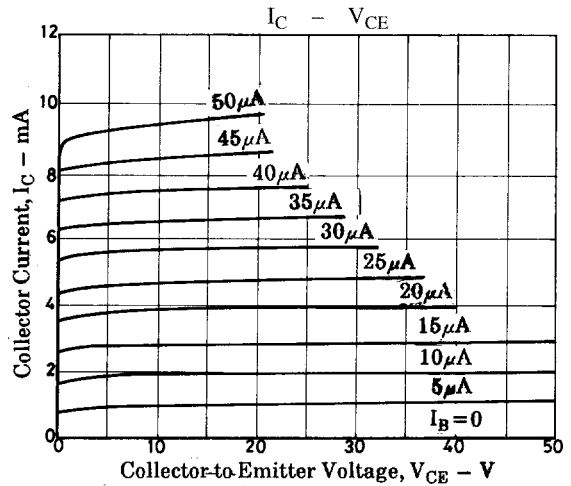
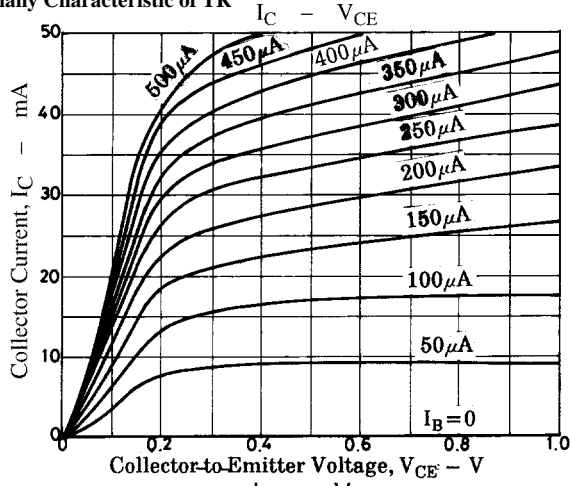
### Primary Characteristics of FET

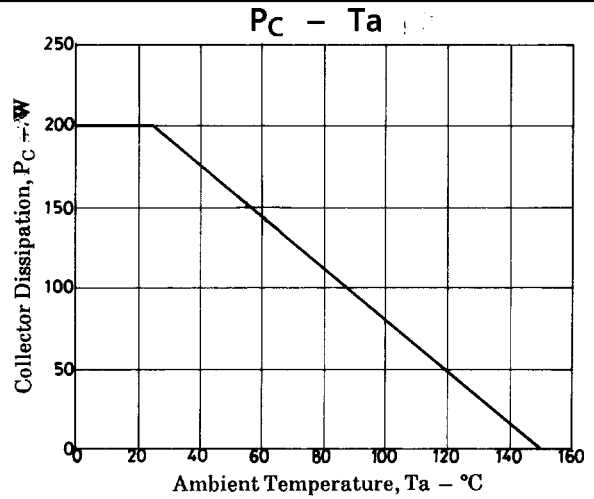
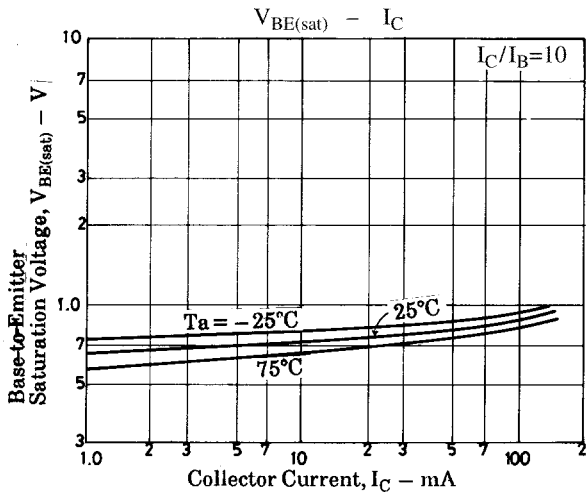


# FC12



Primary Characteristic of TR





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