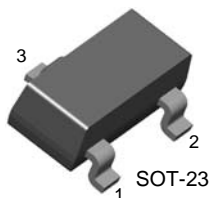


# MMBT5770

## NPN RF Transistor

- This device is designed for use as RF amplifiers, oscillators and multipliers with collector currents in the 1.0 mA to 30 mA range.
- Sourced from process 43.



1. Base 2. Emitter 3. Collector

### Absolute Maximum Ratings $T_a = 25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Value	Units
$V_{CBO}$	Collector-Base Voltage	30	V
$V_{CEO}$	Collector-Emitter Voltage	15	V
$V_{EBO}$	Emitter-Base Voltage	4.5	V
$I_C$	Collector Current - Continuous	10	mA
$T_J, T_{STG}$	Operating and Storage Junction Temperature Range	-55 to +150	$^\circ\text{C}$

### Thermal Characteristics $T_a = 25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Max.	Units
$P_D$	Total Device Dissipation Derate above $25^\circ\text{C}$	225 1.8	mW mW/ $^\circ\text{C}$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	556	$^\circ\text{C/W}$

\* Device mounted on FR-4PCB  $1.6'' \times 1.6'' \times 0.06''$ .

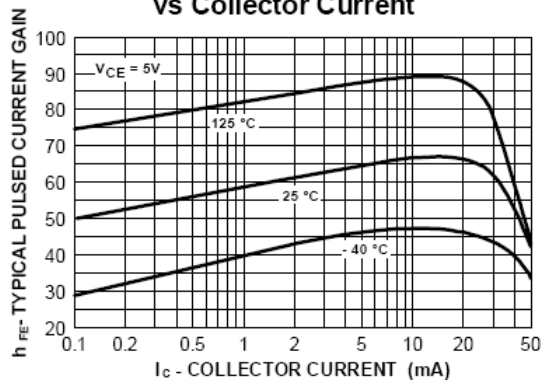
### Electrical Characteristics $T_a = 25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Test Condition	Min.	Max.	Units
<b>Off Characteristics</b>					
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	$I_C = 1.0 \mu\text{A}, I_E = 0$	30		V
$V_{CEO(sus)}$	Collector-Emitter Sustaining Voltage*	$I_C = 3.0 \text{ mA}, I_B = 0$	15		V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	$I_E = 10 \mu\text{A}, I_C = 0$	3		V
$I_{CBO}$	Collector-Cutoff Current	$V_{CB} = 15 \text{ V}, I_E = 0$		50	nA
<b>On Characteristics *</b>					
$h_{FE}$	DC Current Gain	$V_{CE} = 1.0\text{V}, I_C = 3.0\text{mA}$	30		
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C = 10\text{mA}, I_B = 1.0\text{mA}$		0.4	V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	$I_C = 10\text{mA}, I_B = 1.0\text{mA}$		1.0	V
<b>Small Signal Characteristics</b>					
$f_T$	Current Gain Bandwidth Product	$I_C = 4.0\text{mA}, V_{CE} = 10\text{V}, f = 100\text{MHz}$	600		MHz

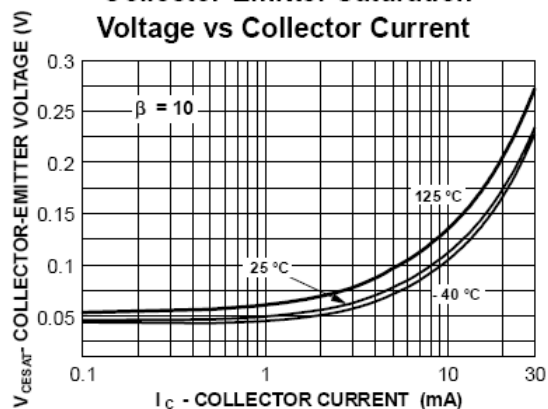
\* Pulse Test: Pulse Width  $\leq 300 \mu\text{s}$ , Duty Cycle  $\leq 2\%$

## Typical Characteristics

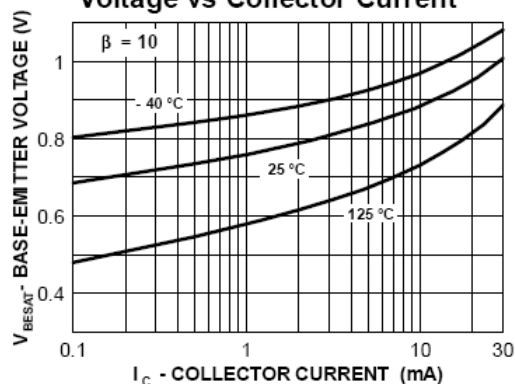
**Typical Pulsed Current Gain  
vs Collector Current**



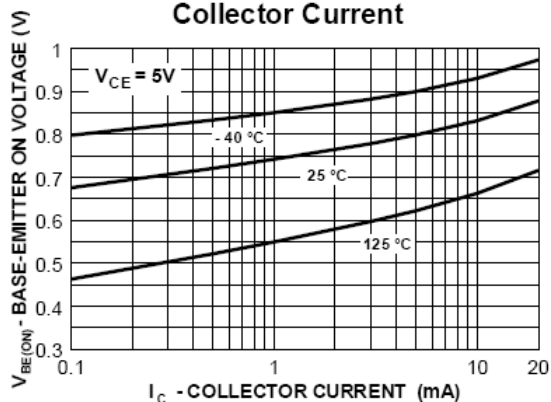
**Collector-Emitter Saturation  
Voltage vs Collector Current**



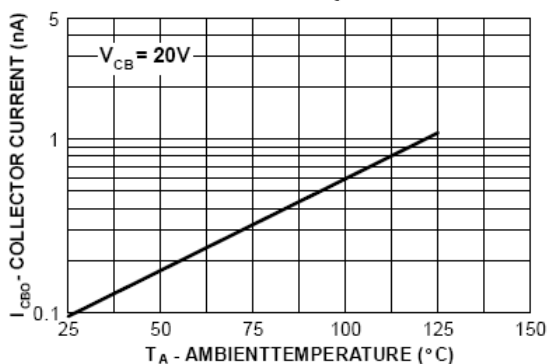
**Base-Emitter Saturation  
Voltage vs Collector Current**



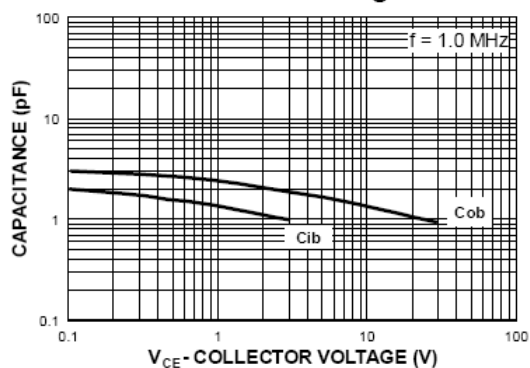
**Base-Emitter ON Voltage vs  
Collector Current**



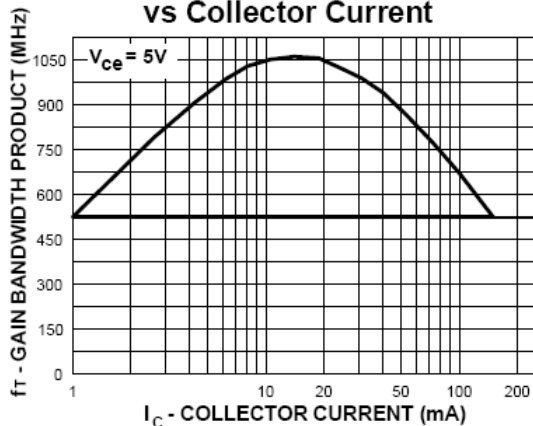
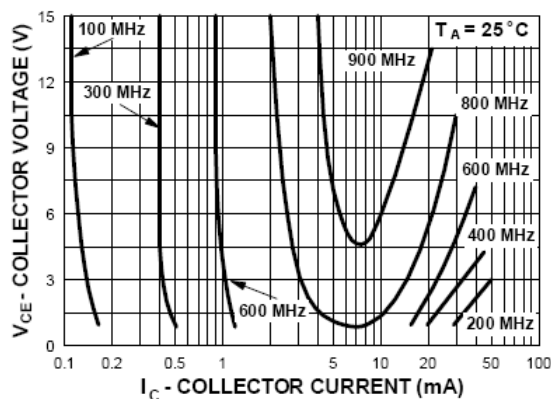
**Collector-Cutoff Current  
vs Ambient Temperature**



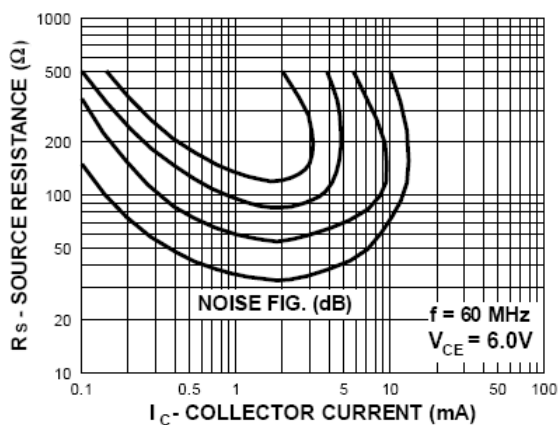
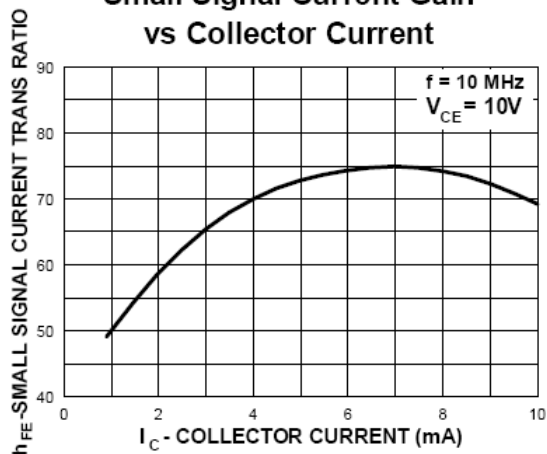
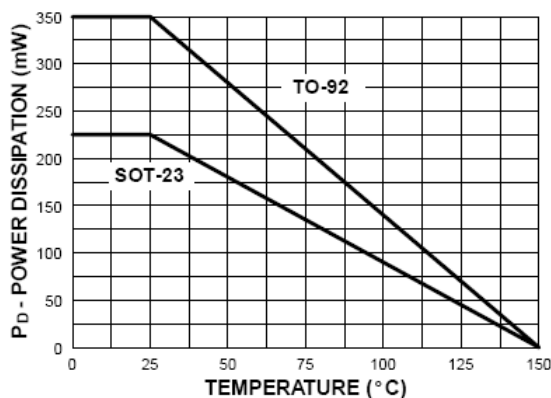
**Input and Output Capacitance  
vs Reverse Voltage**



## Typical Characteristics (continued)

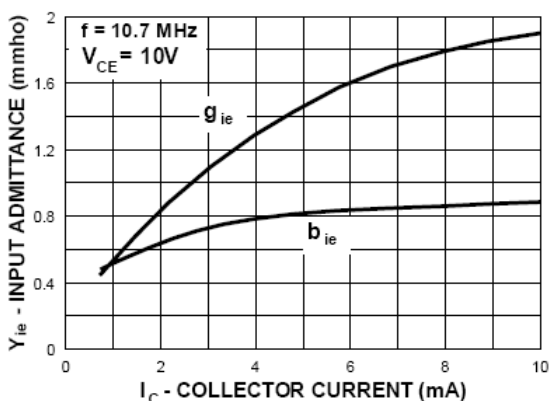
Gain Bandwidth Product  
vs Collector CurrentContours of Constant Gain  
Bandwidth Product ( $f_T$ )

Contours of Constant Noise Figure

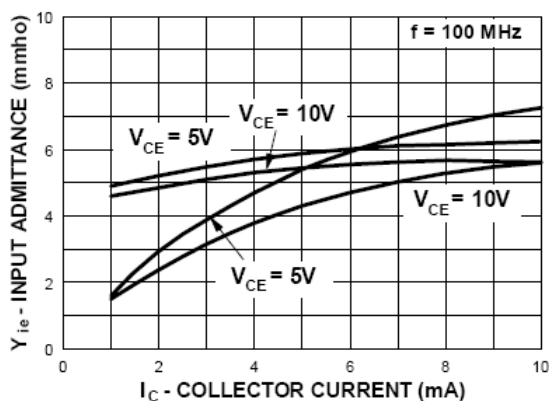
Small Signal Current Gain  
vs Collector CurrentPower Dissipation vs  
Ambient Temperature

## Typical Characteristics (continued)

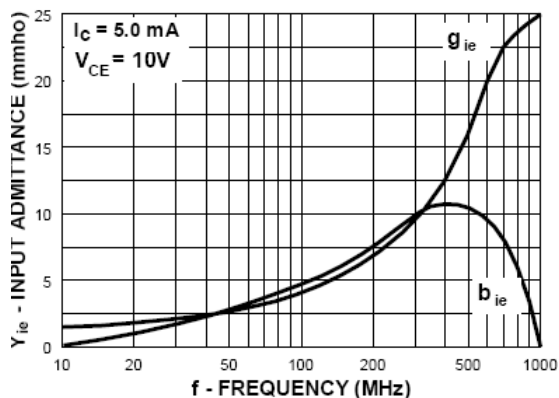
Input Admittance vs Collector Current-Output Short Circuit



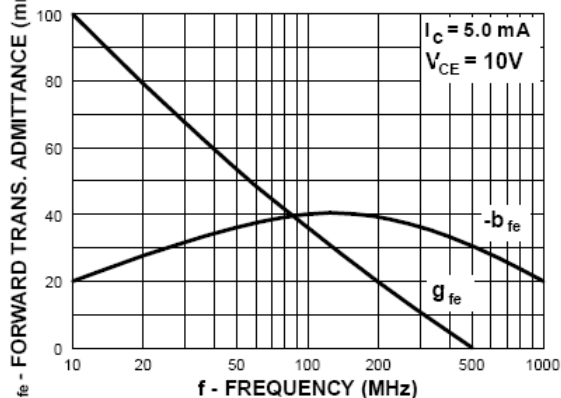
Input Admittance vs Collector Current-Output Short Circuit



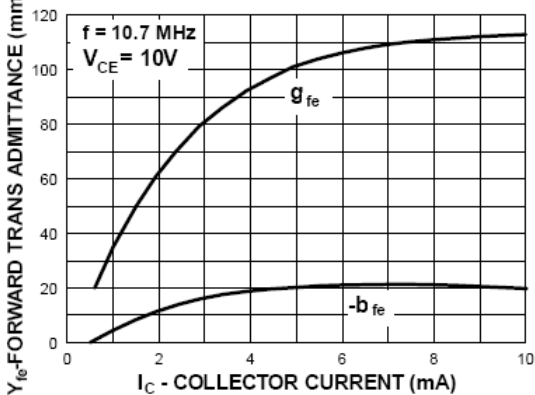
Input Admittance vs Frequency-Output Short Circuit



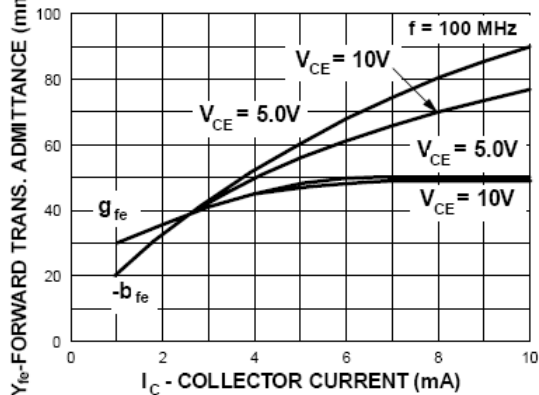
Forward Transfer Admittance vs Frequency-Output Open Circuit



Forward Trans. Admittance vs Collector Current-Output Short Circuit

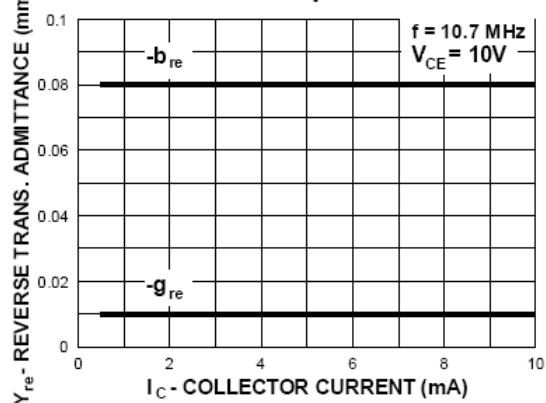


Forward Trans. Admittance vs Collector Current-Output Short Circuit

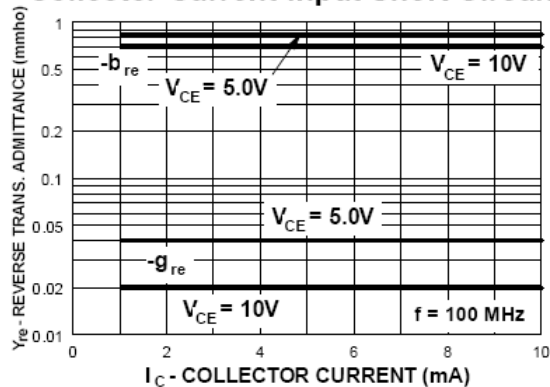


## Typical Characteristics (continued)

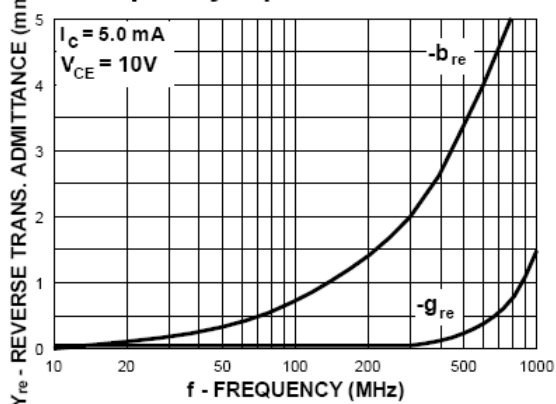
Reverse Transfer Admittance vs Collector Current-Input Short Circuit



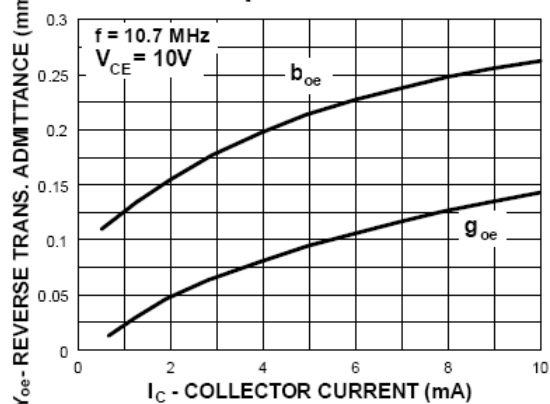
Reverse Transfer Admittance vs Collector Current-Input Short Circuit



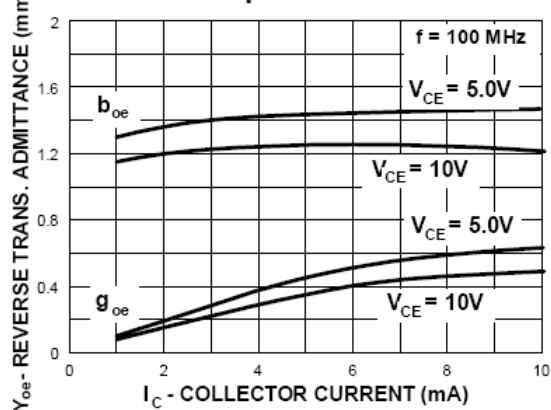
Reverse Transfer Admittance vs Frequency-Input Short Circuit



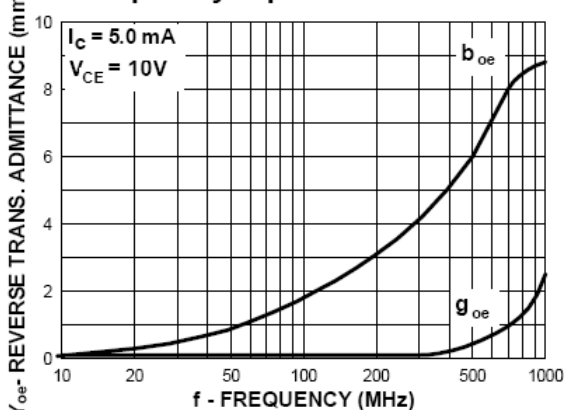
Output Admittance vs Collector Current-Input Short Circuit



Output Admittance vs Collector Current-Input Short Circuit




Output Admittance vs Frequency-Input Short Circuit



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