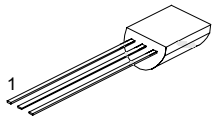
UTC 2N5088/2N5089 NPN EPITAXIAL SILICON TRANSISTOR

NPN GENERAL PURPOSE AMPLIFIER

DESCRIPTION

The device is designed for low noise, high gain, general purpose amplifier applications at collector currents from 1μA to 50mA.



TO-92

1:EMITTER 2:BASE 3:COLLECTOR

MAXIMUM RATINGS (TA=25°C, unless otherwise noted)

RATING	SYMBOL	2N5088	2N5089	UNIT
Collector-Emitter voltage	V_{CEO}	30	25	V
Collector-Base voltage	V_{CBO}	35	30	V
Emitter-base voltage	V_{EBO}	4.5		V
Collector current-continuous	Ic	100		mA
Operating and Storage Junction Temperature Range	T_j, T_{stg}	-55 ~ +150		°C

Note 1: These ratings are based on a maximum junction temperature of 150 degrees C.

Note 2: These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

THERMAL CHARACTERISTICS (TA=25°C, unless otherwise noted)

PARAMETER	SYMBOL	MAX	UNIT
Total Device Dissipation Derate above 25°C	P_D	625 5	mW mW/°C
Thermal Resistance, Junction to Case	$R_{\theta JC}$	83.3	°C/W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	200	°C/W

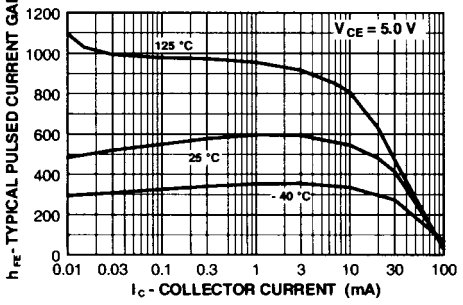
ELECTRICAL CHARACTERISTICS (Ta=25°C, unless otherwise noted)

PARAMETER	SYMBOL	TEST CONDITIONS		MIN	MAX	UNIT
OFF CHARACTERISTICS						
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C=1.0mA, I_B=0				
(note) 2N5088				30		V
2N5089				25		V
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	I_C=100μA, I_E=0				
2N5088				35		V
2N5089				30		V
Collector Cut-Off Current	I_{CBO}					
2N5088		V_{CB}=20V, I_E=0			50	nA
2N5089		V_{CB}=15V, I_E=0			50	nA
Emitter Cutoff Current	I_{EBO}					
		V_{EB}=3.0V, I_C=0			50	nA
		V_{EB}=4.5V, I_C=0			100	nA
ON CHARACTERISTICS						
DC Current Gain	h_{FE}	V_{CE}=5.0V, I_C=100μA	2N5088	300	900	
			2N5089	400	1200	
		V_{CE}=5.0V, I_C=1.0mA	2N5088	350		
			2N5089	450		
		V_{CE}=5.0V, I_C=10mA	2N5088	300		
		(NOTE)	2N5089	400		
Collector-Emitter Saturation Voltage	V_{CE}(sat)	I_C=10mA, I_B=1.0mA			0.5	V
Base-Emitter On Voltage	V_{BE}(on)	I_C=10mA, V_{CE}=5.0V			0.8	V
SMALL SIGNAL CHARACTERISTICS						
Current Gain-Bandwidth Product	f_T	V_{CE}=5.0mA, Ic=500μA, f=20MHz		50		MHz
Collector-Base Capacitance	Ccb	V_{CB}=5.0V, I_E=0, f=100kHz			4	pF
Emitter-Base Capacitance	Ceb	V_{EB}=0.5V, Ic=0, f=100kHz			10	pF
Small-Signal Current Gain	h_{FE}	V_{CE}=5.0V, Ic=1.0mA, f=1.0kHz				
2N5088				350	1400	
2N5089				450	1800	
Noise Figure	NF	V_{CE}=5.0V, Ic=100μA, R_S=10kΩ,				
2N5088		f=10KHz to 15.7kHz			3.0	dB
2N5089					2.0	dB

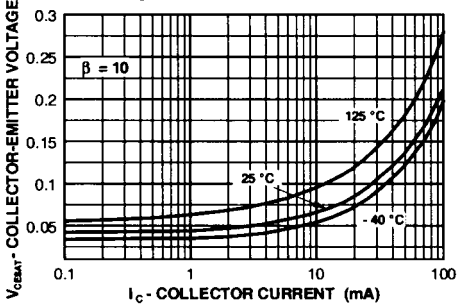
Note: Pulse Test: Pulse Width≤300μs, Duty Cycle≤2.0%.

TYPICAL CHARACTERISTICS

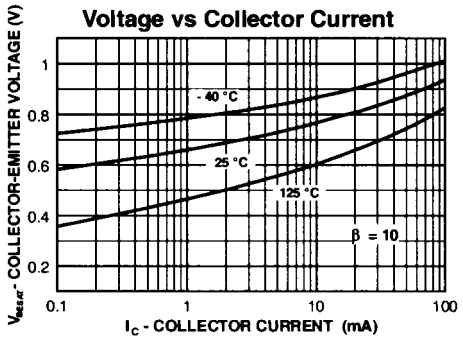
Typical Pulsed Current Gain vs Collector Current



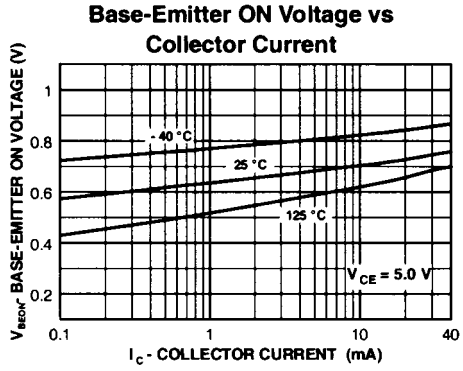
Collector-Emitter Saturation Voltage vs Collector Current



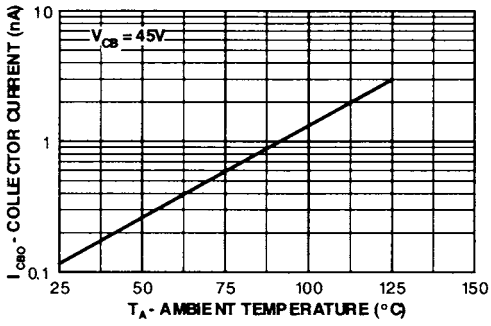
Base-Emitter Saturation Voltage vs Collector Current



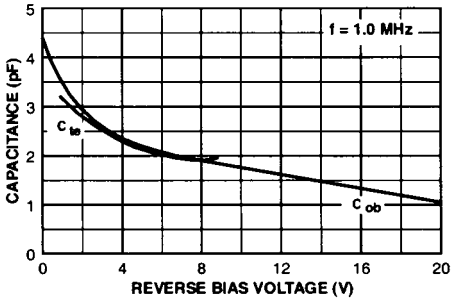
Base-Emitter ON Voltage vs Collector Current



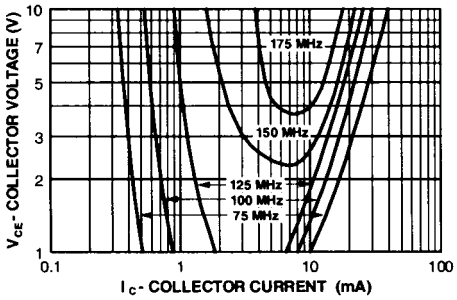
Collector-Cutoff Current vs Ambient Temperature



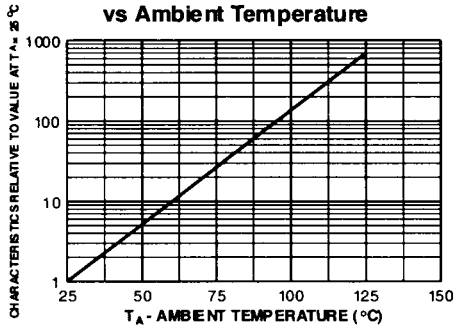
Input and Output Capacitance vs Reverse Bias Voltage



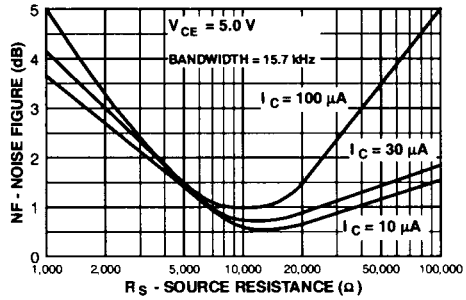
Contours of Constant Gain Bandwidth Product (f_T)



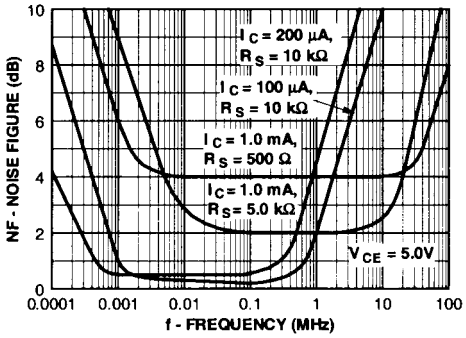
Normalized Collector-Cutoff Current vs Ambient Temperature



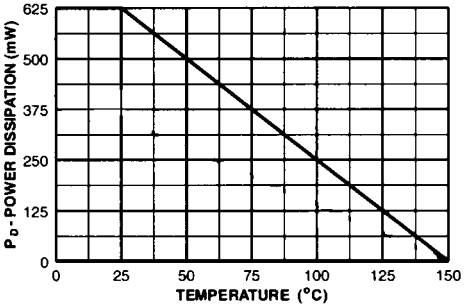
Wideband Noise Frequency vs Source Resistance



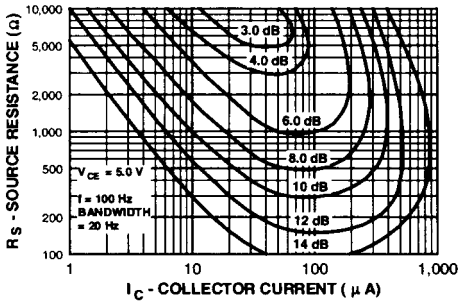
Noise Figure vs Frequency



Power Dissipation vs Ambient Temperature



Contours of Constant Narrow Band Noise Figure



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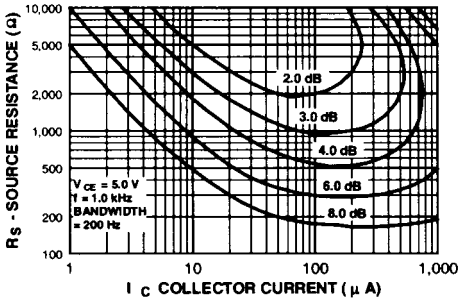
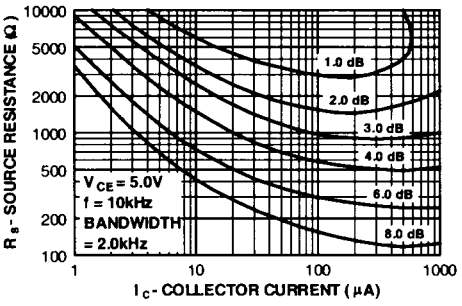
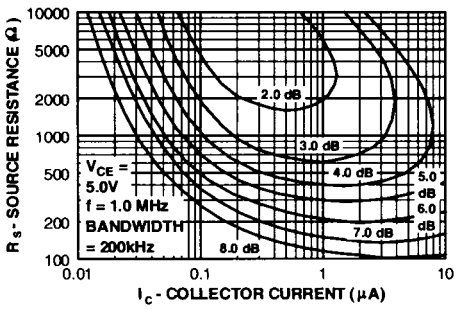


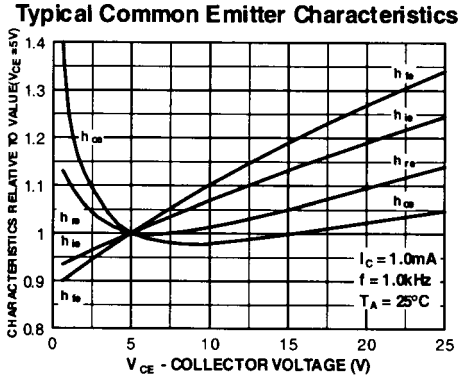
Contours of Constant Narrow Band Noise Figure



Contours of Constant Narrow Band Noise Figure



Typical Common Emitter Characteristics



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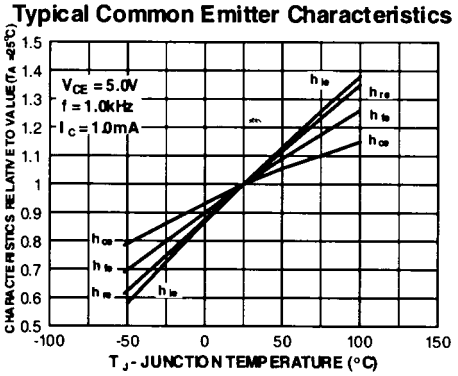

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