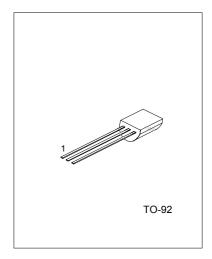
#### NPN GENERAL PURPOSE AMPLIFIER

#### **DESCRIPTION**

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



1:EMITTER 2:BASE 3:COLLECTOR

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

,	<u> </u>		ı		
RATING	SYMBOL	2N5088 2N5089		UNIT	
Collector-Emitter voltage	VCEO	30 25		V	
Collector-Base voltage	Vсво	35 30		V	
Emitter-base voltage	VEBO	4.5		V	
Collector current-continuous	www.DataSheet4U.com	100		mA	
Operating and Storage	Tj, Tstg	-55 ~ <b>+</b> 150		°C	
Junction Temperature Range					

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

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

PARAMETER	SYMBOL	MAX	UNIT
Total Device Dissipation	$P_{D}$	625	mW
Derate above 25°C		5	mW/°C
Thermal Resistance, Junction to Case	Rejc	83.3	°C/W
Thermal Resistance, Junction to	RеJA	200	°C/W
Ambient			

UTC UNISONIC TECHNOLOGIES CO., LTD.

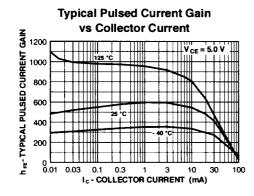
Note 2: These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

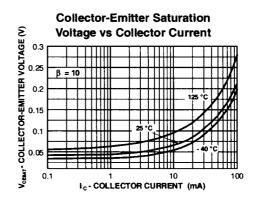
ELECTRICAL CHARACTERISTICS (Ta=25°C, unless otherwise noted)

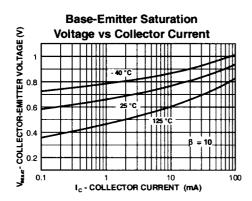
ELECTRICAL CHARACTERIS	, , , , , , , , , , , , , , , , , , , ,					
PARAMETER	SYMBOL	TEST CONDIT	MIN	MAX	UNIT	
OFF CHARACTERISTICS	1	T		1	1	
Collector-Emitter Breakdown Voltage	V(BR)CEO	$I_C=1.0$ mA, $I_B=0$				
(note) 2N5088				30		V
2N5089				25		V
Collector-Base Breakdown Voltage	V(BR)CBO	$I_C=100\mu A, I_E=0$				
2N5088				35		V
2N5089				30		V
Collector Cut-Off Current	Ісво					
2N5088		$V_{CB}$ =20V, $I_E$ =0			50	nA
2N5089		V <sub>CB</sub> =15V, I <sub>E</sub> =0			50	nA
Emitter Cutoff Current	IEBO					
		$V_{EB}$ =3.0V, $I_{C}$ =0			50	nA
		$V_{EB}$ =4.5 $V$ , $I_{C}$ =0			100	nA
ON CHARACTERISTICS					•	
DC Current Gain	hFE	$V_{CE}$ =5.0V, $I_{C}$ =100 $\mu$ A	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	Vce(sat)	I <sub>C</sub> =10mA, I <sub>B</sub> =1.0mA			0.5	V
Base-Emitter On Voltage	VBE(on)	$I_C$ =10mA, $V_{CE}$ =5.0V			8.0	V
SMALL SIGNAL CHARACTERISTICS						
Current Gain-Bandwidth Product	f⊤	VCE=5.0mA, Ic=500μA	, f=20MHz	50		MHz
Collector-Base Capacitance	Ccb	VcB=5.0V, I <sub>E</sub> =0, f=100kHz			4	pF
Emitter-Base Capacitance	Ceb	VEB=0.5V, Ic=0, f=100kHz			10	pF
Small-Signal Current Gain	h <sub>FE</sub>	VCE=5.0V, Ic=1.0mA, f	=1.0kHz			
2N5088				350	1400	
2N5089				450	1800	
Noise Figure	NF	VCE=5.0V, Ic=100μA, F	Rs=10kΩ,			
2N5088		f=10KHz to 15.7kHz	-		3.0	dB
2N5089					2.0	dB

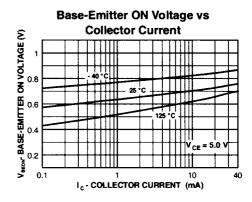
Note: Pulse Test: Pulse Width≤300µs, Duty Cycle≤2.0%.

#### TYPICAL CHARACTERISTICS

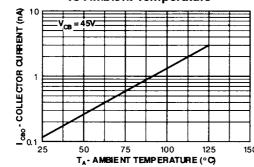


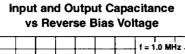


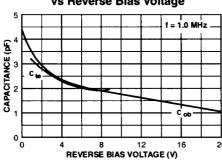




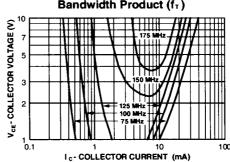
# Collector-Cutoff Current vs Ambient Temperature



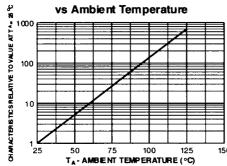




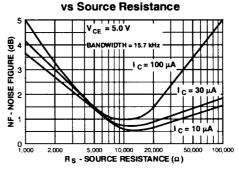
#### **Contours of Constant Gain** Bandwidth Product (f<sub>T</sub>)



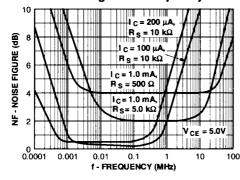
**Normalized Collector-Cutoff Current** 



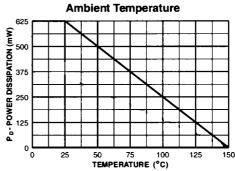
# Wideband Noise Frequency

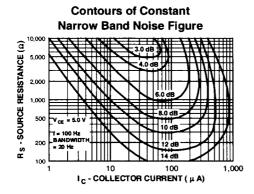


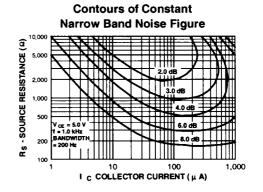
Noise Figure vs Frequency

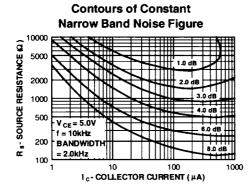


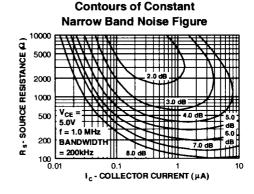
**Power Dissipation vs** 

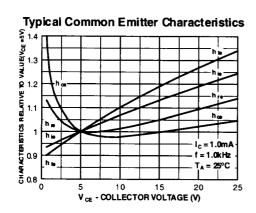


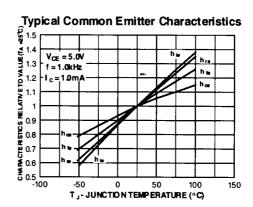


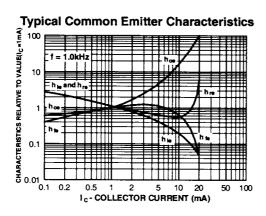












UTC assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all UTC products described or contained herein. UTC products are not designed for use in life support appliances, devices or systems where malfunction of these products can be reasonably expected to result in personal injury. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. The information presented in this document does not form part of any quotation or contract, is believed to be accurate and reliable and may be changed without notice.

UTC UNISONIC TECHNOLOGIES CO., LTD. 6