



## 2SD965/A

## NPN SILICON TRANSISTOR

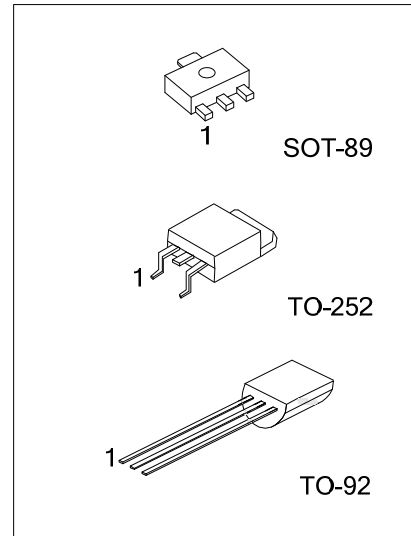
### LOW VOLTAGE HIGH CURRENT TRANSISTOR

#### FEATURES

- \* Collector current up to 5A
- \* UTC **2SD965**: Collector-Emitter voltage up to 20 V
- \* UTC **2SD965A**: Collector-Emitter voltage up to 30 V

#### APPLICATIONS

- \* Audio amplifier
- \* Flash unit of camera
- \* Switching circuit



#### ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
-	2SD965G-x-AB3-R	SOT-89	B	C	E	Tape Reel
2SD965L-x-T92-B	2SD965G-x-T92-B	TO-92	E	C	B	Tape Box
2SD965L-x-T92-K	2SD965G-x-T92-K	TO-92	E	C	B	Bulk
2SD965L-x-TN3-R	2SD965G-x-TN3-R	TO-252	B	C	E	Tape Reel
-	2SD965AG-x-AB3-R	SOT-89	B	C	E	Tape Reel
2SD965AL-x-T92-B	2SD965AG-x-T92-B	TO-92	E	C	B	Tape Box
2SD965AL-x-T92-K	2SD965AG-x-T92-K	TO-92	E	C	B	Bulk
2SD965AL-x-TN3-R	2SD965AG-x-TN3-R	TO-252	B	C	E	Tape Reel

Note: Pin Assignment: C: Collector B: Base E: Emitter

<p>2SD965G-x-AB3-R</p> <p>(1) Packing Type (2) Package Type (3) Rank (4) Green Package</p>	<p>(1) R: Tape Reel, B: Tape Box, K: Bulk (2) AB3: SOT-89, T92: TO-92, TN3: TO-252 (3) x: refer to Classification of <math>h_{FE2}</math> (4) G: Halogen Free and Lead Free, L: Lead Free</p>
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## MARKING

PACKAGE	MARKING	
	2SD965	2SD965A
SOT-89		
TO-252		
TO-92		

■ ABSOLUTE MAXIMUM RATING (T<sub>A</sub>=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT	
Collector-Base Voltage	V <sub>CBO</sub>	40	V	
Collector-Emitter Voltage	V <sub>CEO</sub>	2SD965	20	V
		2SD965A	30	V
Emitter-Base Voltage	V <sub>EBO</sub>	7	V	
Collector Dissipation	P <sub>C</sub>	SOT-89	500	mW
		TO-92	750	mW
		TO-252	1	W
Collector Current	I <sub>C</sub>	5	A	
Junction Temperature	T <sub>J</sub>	150	°C	
Storage Temperature	T <sub>STG</sub>	-65 ~ +150	°C	

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

■ ELECTRICAL CHARACTERISTICS (T<sub>A</sub>=25°C, unless otherwise specified)

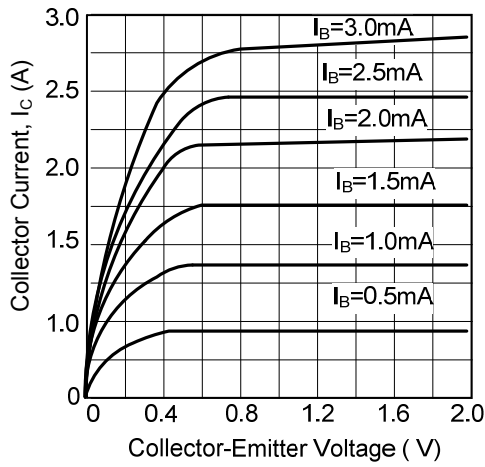
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Collector-Base Breakdown Voltage	BV <sub>CBO</sub>	I <sub>C</sub> =100μA, I <sub>E</sub> =0	40			V
Collector-Emitter Breakdown Voltage	BV <sub>CEO</sub>	I <sub>C</sub> =1mA, I <sub>B</sub> =0	2SD965	20		V
			2SD965A	30		V
Emitter-Base Breakdown Voltage	BV <sub>EBO</sub>	I <sub>E</sub> =10μA, I <sub>C</sub> =0	7			V
Collector Cut-off Current	I <sub>CBO</sub>	V <sub>CB</sub> =10V, I <sub>E</sub> =0			100	nA
Emitter Cut-off Current	I <sub>EBO</sub>	V <sub>EB</sub> =7V, I <sub>C</sub> =0			100	nA
DC Current Gain	h <sub>FE1</sub>	V <sub>CE</sub> =2V, I <sub>C</sub> =1mA		200		
	h <sub>FE2</sub>	V <sub>CE</sub> =2V, I <sub>C</sub> =0.5A	230		800	
	h <sub>FE3</sub>	V <sub>CE</sub> =2V, I <sub>C</sub> =2A	150			
Collector-Emitter Saturation Voltage	V <sub>CE(SAT)</sub>	I <sub>C</sub> =3A, I <sub>B</sub> =0.1A			1	V
Current Gain Bandwidth Product	f <sub>T</sub>	V <sub>CE</sub> =6V, I <sub>C</sub> =50mA		150		MHz
Output Capacitance	C <sub>ob</sub>	V <sub>CB</sub> =20V, I <sub>E</sub> =0, f=1MHz			50	pF

■ CLASSIFICATION OF h<sub>FE2</sub>

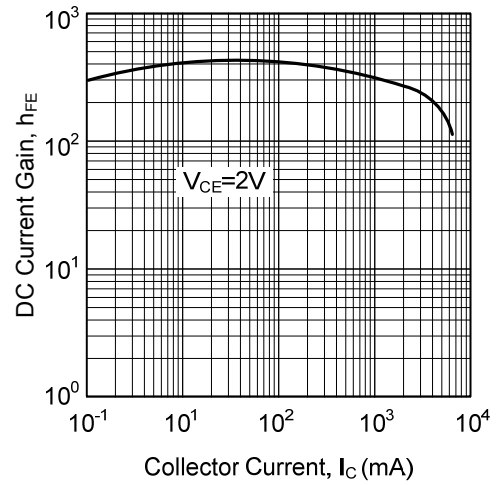
RANK	Q	R	S
RANGE	230-380	340-600	560-800

## TYPICAL CHARACTERISTICS

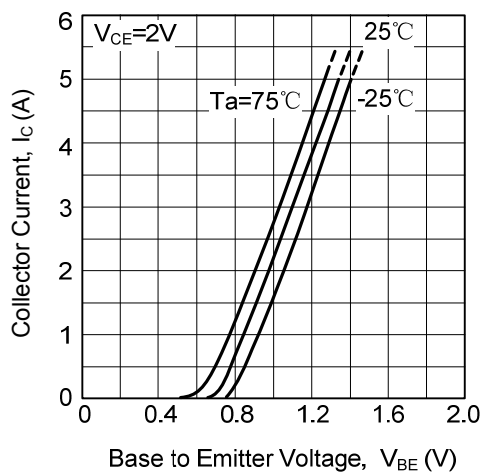
Static Characteristics



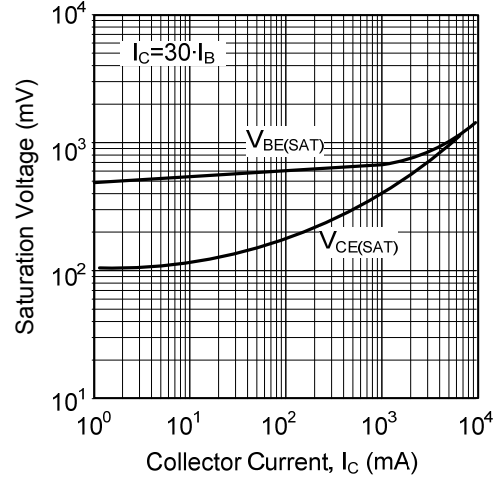
DC Current Gain



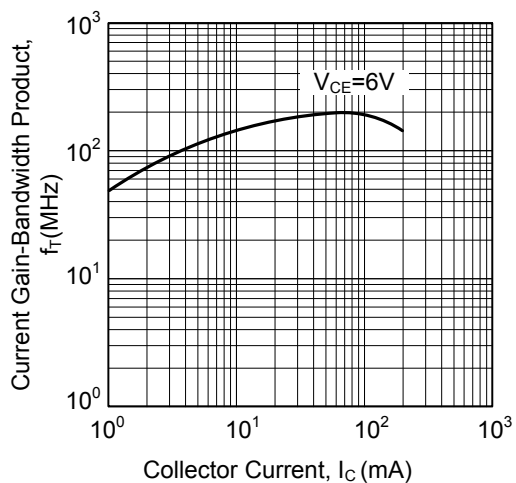
Base-Emitter on Voltage



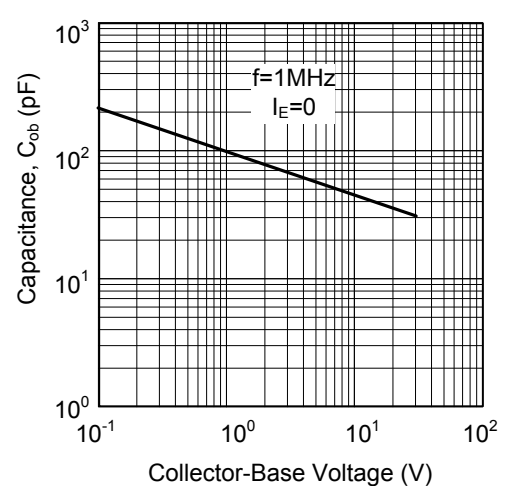
Saturation Voltage



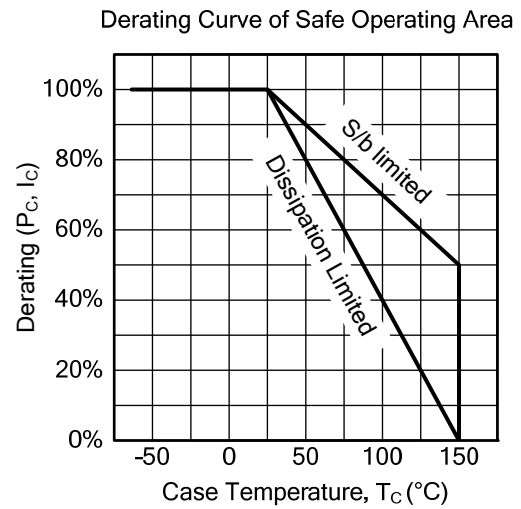
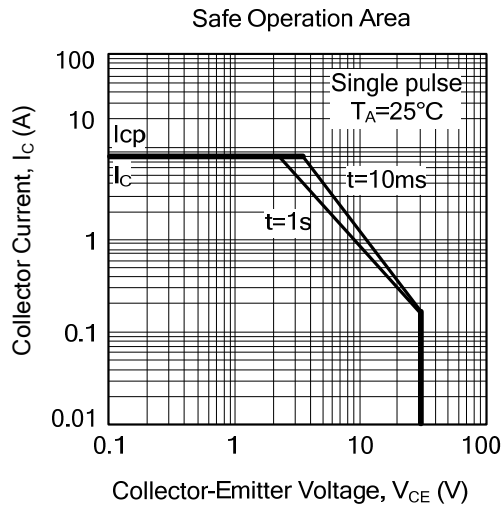
Current Gain-Bandwidth Product



Collector Output Capacitance



### TYPICAL CHARACTERISTICS



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