



## 2SD965/A

## NPN SILICON TRANSISTOR

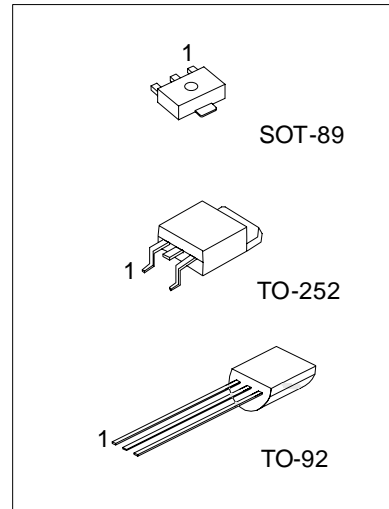
### LOW VOLTAGE HIGH CURRENT TRANSISTOR

#### 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



\*Pb-free plating product number:  
2SD965L/2SD965AL

#### ORDERING INFORMATION

Order Number		Package	Pin Assignment			Packing
Normal	Lead Free Plating		1	2	3	
2SD965-x-AB3-R	2SD965L-x-AB3-R	SOT-89	B	C	E	Tape Reel
2SD965-x-T92-B	2SD965L-x-T92-B	TO-92	E	C	B	Tape Box
2SD965-x-T92-K	2SD965L-x-T92-K	TO-92	E	C	B	Bulk
2SD965-x-TN3-R	2SD965L-x-TN3-R	TO-252	B	C	E	Tape Reel
2SD965-x-TN3-T	2SD965L-x-TN3-T	TO-252	B	C	E	Tube
2SD965A-x-AB3-R	2SD965AL-x-AB3-R	SOT-89	B	C	E	Tape Reel
2SD965A-x-T92-B	2SD965AL-x-T92-B	TO-92	E	C	B	Tape Box
2SD965A-x-T92-K	2SD965AL-x-T92-K	TO-92	E	C	B	Bulk
2SD965A-x-TN3-R	2SD965AL-x-TN3-R	TO-252	B	C	E	Tape Reel
2SD965A-x-TN3-T	2SD965AL-x-TN3-T	TO-252	B	C	E	Tube

<p>2SD965L-x-AB3-R</p>	<p>(1) B: Tape Box, K: Bulk, R: Tape Reel, T: Tube</p> <p>(2) AB3: SOT-89, T92: TO-92, TN3: TO-252</p> <p>(3) x: refer to Classification of <math>h_{FE2}</math></p> <p>(4) L: Lead Free Plating, Blank: Pb/Sn</p>
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■ ABSOLUTE MAXIMUM RATING (Ta=25 )

PARAMETER		SYMBOL	RATINGS	UNIT
Collector-Base Voltage		V <sub>CBO</sub>	40	V
Collector-Emitter Voltage	2SD965	V <sub>CEO</sub>	20	V
	2SD965A		30	V
Emitter-Base Voltage		V <sub>EBO</sub>	7	V
Collector Dissipation	SOT-89	P <sub>C</sub>	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	
Storage Temperature		T <sub>STG</sub>	-65 ~ +150	

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 (Ta=25 , unless otherwise specified)

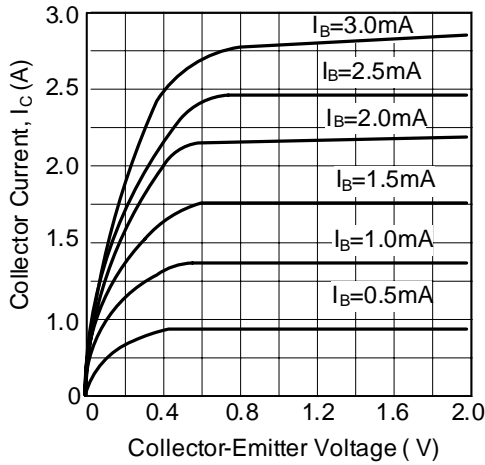
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Collector-Base Breakdown Voltage		BV <sub>CBO</sub>	I <sub>C</sub> =100μA, I <sub>E</sub> =0	40			V
Collector-Emitter Breakdown Voltage	2SD965	BV <sub>CEO</sub>	I <sub>C</sub> =1mA, I <sub>B</sub> =0	20			V
	2SD965A			30			V
Emitter-Base Breakdown Voltage		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(note)	h <sub>FE</sub>		V <sub>CE</sub> =2V, I <sub>C</sub> =1mA		200		
			V <sub>CE</sub> =2V, I <sub>C</sub> =0.5A	230		800	
			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>

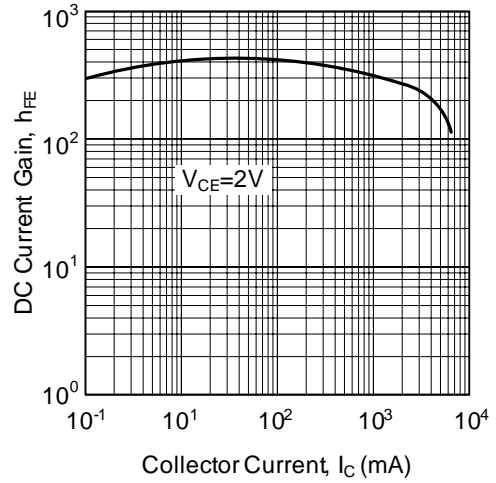
RANK	Q	R	S
RANGE	230-380	340-600	560-800

## TYPICAL CHARACTERISTICS

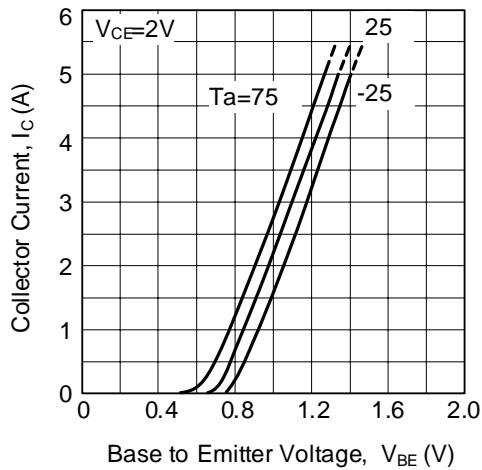
Static Characteristics



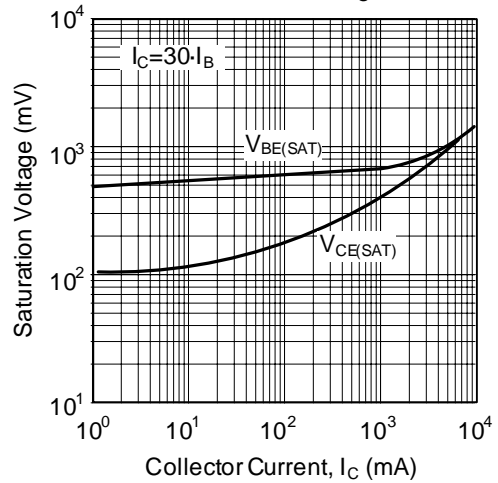
DC Current Gain



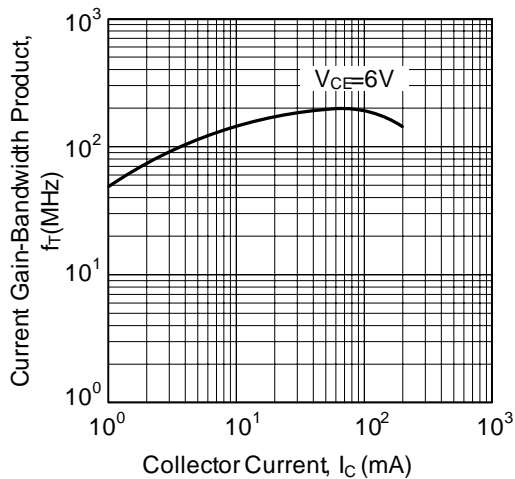
Base-Emitter on Voltage



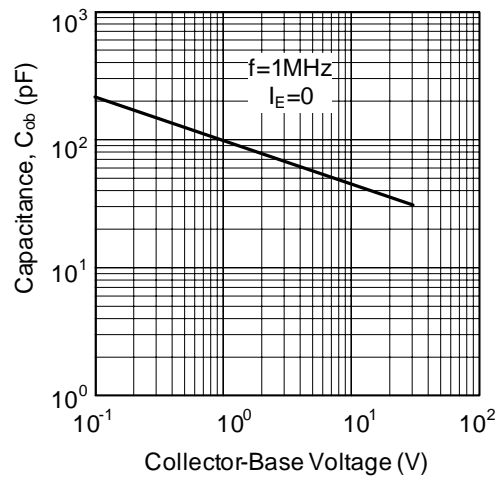
Saturation Voltage



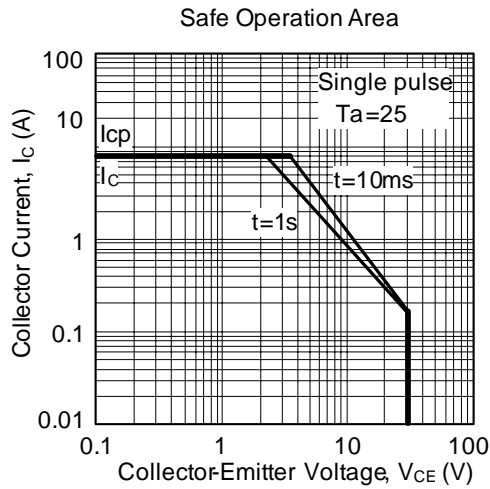
Current Gain-Bandwidth Product



Collector Output Capacitance



■ TYPICAL CHARACTERISTICS



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