



## 2SD965/A

## NPN SILICON TRANSISTOR

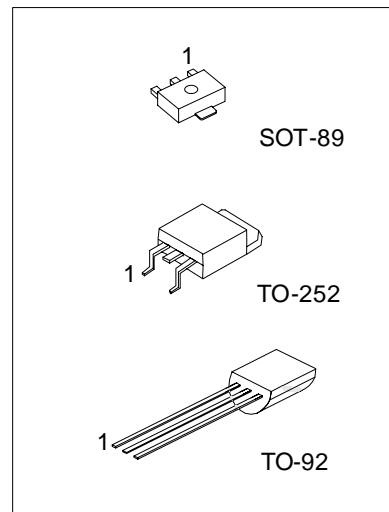
### LOW VOLTAGE HIGH CURRENT TRANSISTOR

#### 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		$V_{CBO}$	40	V
Collector-Emitter Voltage	2SD965	$V_{CEO}$	20	V
	2SD965A		30	V
Emitter-Base Voltage		$V_{EBO}$	7	V
Collector Dissipation	SOT-89	$P_C$	500	mW
	TO-92		750	mW
	TO-252		1	W
Collector Current		$I_C$	5	A
Junction Temperature		$T_J$	150	
Storage Temperature		$T_{STG}$	-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)

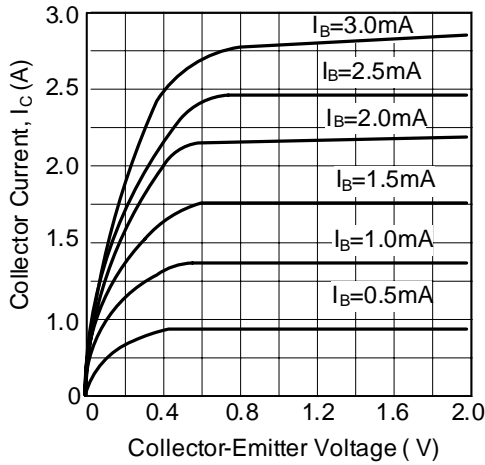
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Collector-Base Breakdown Voltage		$BV_{CBO}$	$I_C=100\mu A, I_E=0$	40			V
Collector-Emitter Breakdown Voltage	2SD965	$BV_{CEO}$	$I_C=1mA, I_B=0$	20			V
	2SD965A			30			V
Emitter-Base Breakdown Voltage		$BV_{EBO}$	$I_E=10\mu A, I_C=0$	7			V
Collector Cut-off Current		$I_{CBO}$	$V_{CB}=10V, I_E=0$			100	nA
Emitter Cut-off Current		$I_{EBO}$	$V_{EB}=7V, I_C=0$			100	nA
DC Current Gain(note)		$h_{FE}$	$V_{CE}=2V, I_C=1mA$		200		
			$V_{CE}=2V, I_C=0.5A$	230		800	
			$V_{CE}=2V, I_C=2A$	150			
Collector-Emitter Saturation Voltage		$V_{CE(SAT)}$	$I_C=3A, I_B=0.1A$			1	V
Current Gain Bandwidth Product		$f_T$	$V_{CE}=6V, I_C=50mA$		150		MHz
Output Capacitance		$C_{ob}$	$V_{CB}=20V, I_E=0, f=1MHz$			50	pF

■ CLASSIFICATION OF  $h_{FE2}$

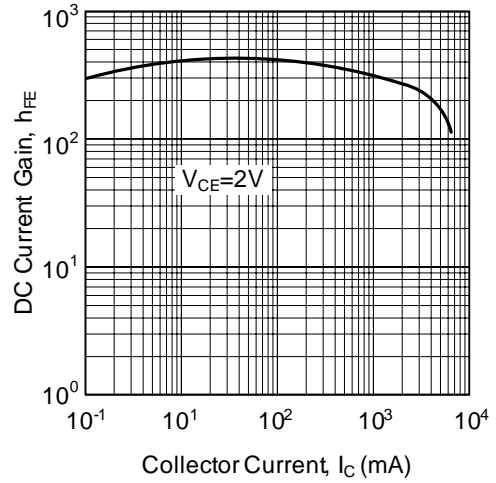
RANK	Q	R	S
RANGE	230-380	340-600	560-800

■ TYPICAL CHARACTERISTICS

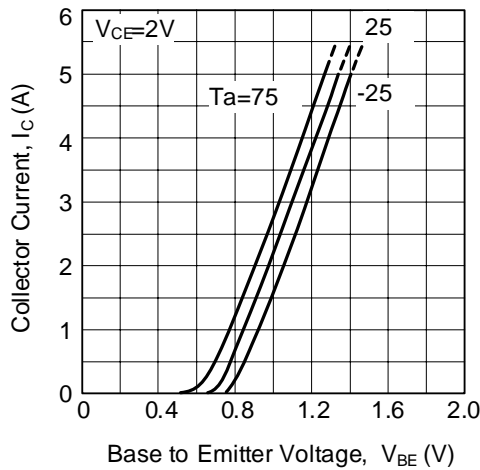
Static Characteristics



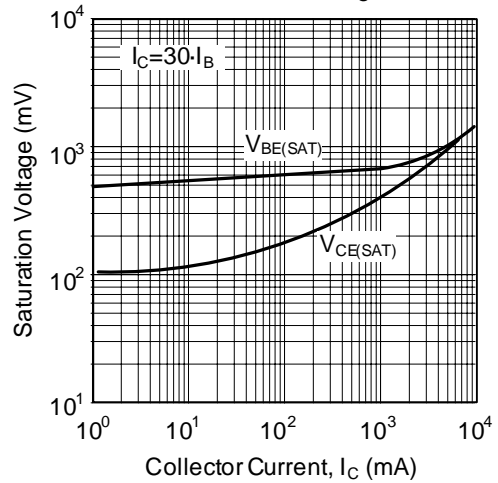
DC Current Gain



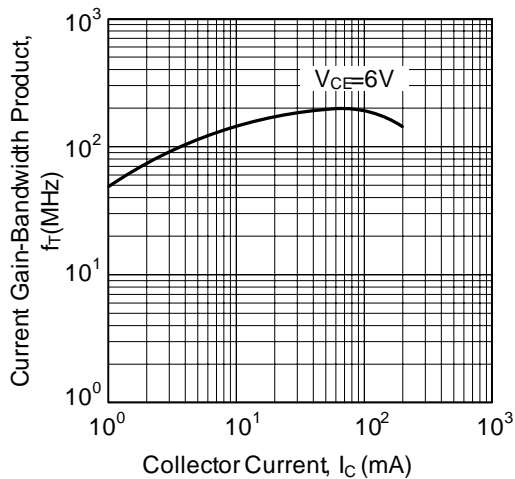
Base-Emitter on Voltage



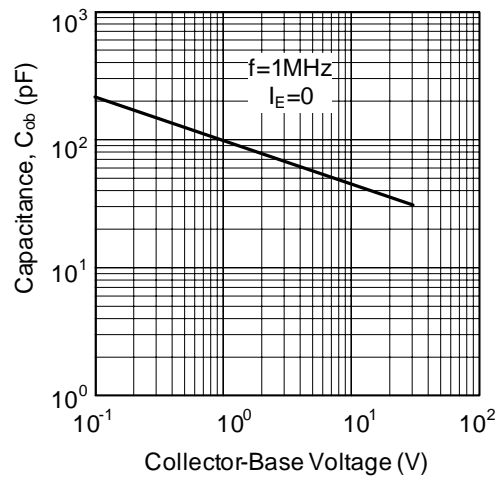
Saturation Voltage



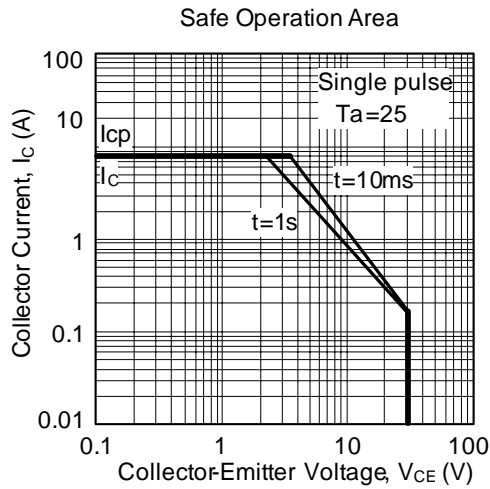
Current Gain-Bandwidth Product



Collector Output Capacitance



■ TYPICAL CHARACTERISTICS



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