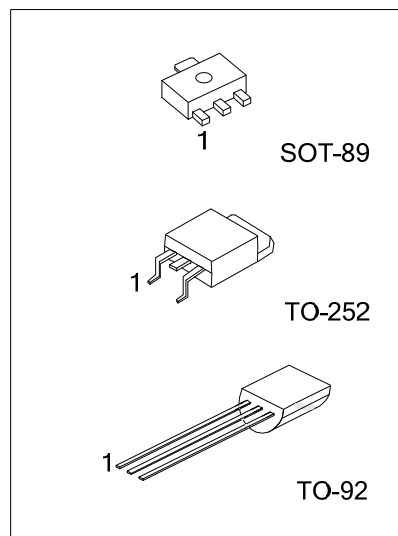


**2SD965/A****NPN SILICON TRANSISTOR****LOW VOLTAGE HIGH
CURRENT TRANSISTOR****■ FEATURES**

- * 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

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

MARKING

PACKAGE	MARKING	
	2SD965	2SD965A
SOT-89	□□□□ 2SD965G → Date Code 1	□□□□ 2SD965AG → Date Code 1
TO-252	UTC 2SD965□ □□□□□□ → L: Lead Free → G: Halogen Free → Data Code Lot Code ← 1	UTC 2SD965A□ □□□□□□ → L: Lead Free → G: Halogen Free → Data Code Lot Code ← 1
TO-92	UTC D 9 6 5 □ □ □□□ → L: Lead Free → G: Halogen Free → Data Code Rank ← 1	UTC D965A □ □ □□□ → L: Lead Free → G: Halogen Free → Data Code Rank ← 1

■ **ABSOLUTE MAXIMUM RATING** ($T_A=25^{\circ}\text{C}$)

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	$^{\circ}\text{C}$
Storage Temperature		T_{STG}	-65 ~ +150	$^{\circ}\text{C}$

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** ($T_A=25^{\circ}\text{C}$, unless otherwise specified)

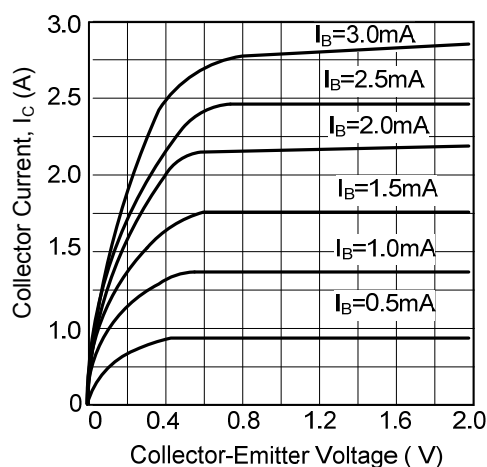
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Collector-Base Breakdown Voltage		BV_{CBO}	$I_C=100\mu\text{A}$, $I_E=0$	40			V
Collector-Emitter Breakdown Voltage	2SD965	BV_{CEO}	$I_C=1\text{mA}$, $I_B=0$	20			V
	2SD965A			30			V
Emitter-Base Breakdown Voltage		BV_{EBO}	$I_E=10\mu\text{A}$, $I_C=0$	7			V
Collector Cut-off Current		I_{CBO}	$V_{CB}=10\text{V}$, $I_E=0$			100	nA
Emitter Cut-off Current		I_{EBO}	$V_{EB}=7\text{V}$, $I_C=0$			100	nA
DC Current Gain		h_{FE1}	$V_{CE}=2\text{V}$, $I_C=1\text{mA}$		200		
		h_{FE2}	$V_{CE}=2\text{V}$, $I_C=0.5\text{A}$	230		800	
		h_{FE3}	$V_{CE}=2\text{V}$, $I_C=2\text{A}$	150			
Collector-Emitter Saturation Voltage		$V_{CE(SAT)}$	$I_C=3\text{A}$, $I_B=0.1\text{A}$			1	V
Current Gain Bandwidth Product		f_T	$V_{CE}=6\text{V}$, $I_C=50\text{mA}$		150		MHz
Output Capacitance		C_{ob}	$V_{CB}=20\text{V}$, $I_E=0$, $f=1\text{MHz}$			50	pF

■ **CLASSIFICATION OF h_{FE2}**

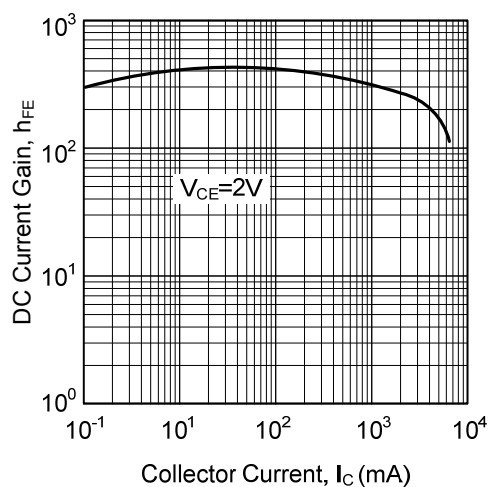
RANK	Q	R	S
RANGE	230-380	340-600	560-800

TYPICAL CHARACTERISTICS

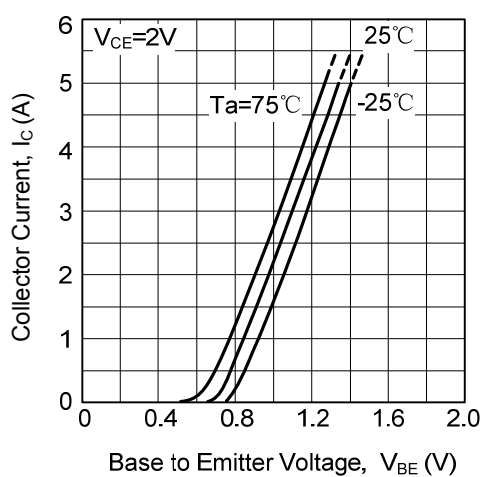
Static Characteristics



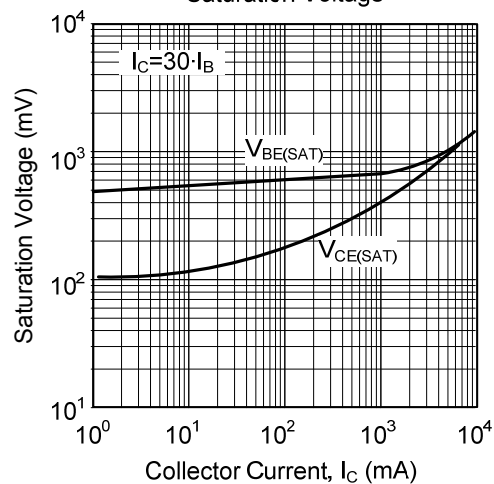
DC Current Gain



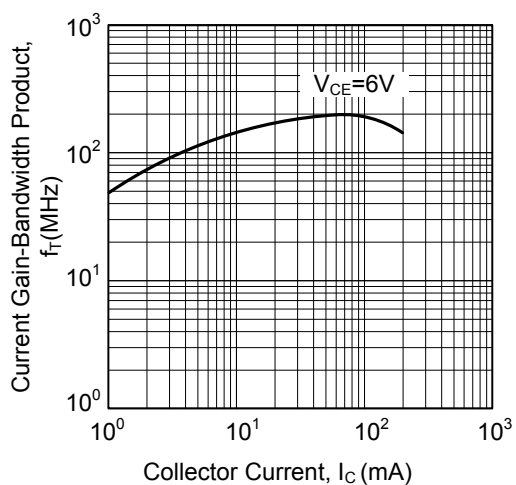
Base-Emitter on Voltage



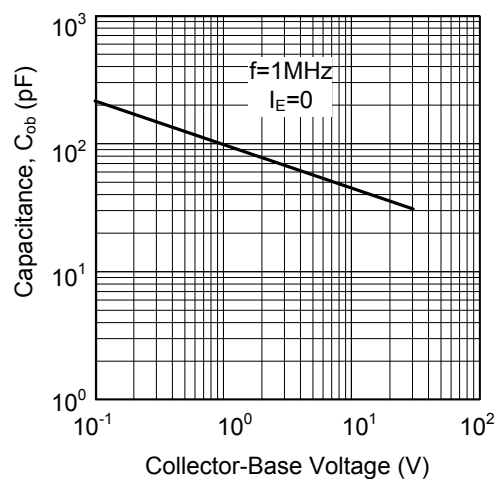
Saturation Voltage



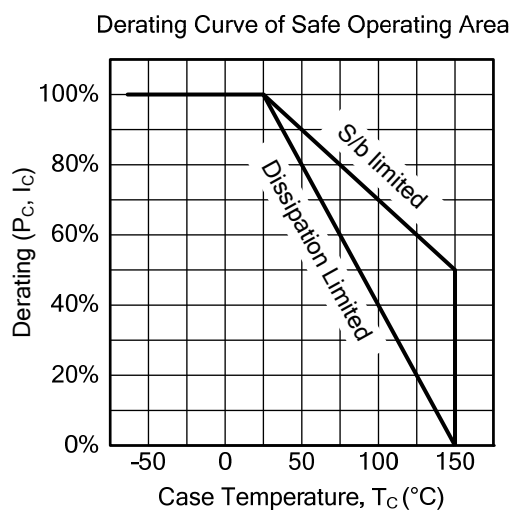
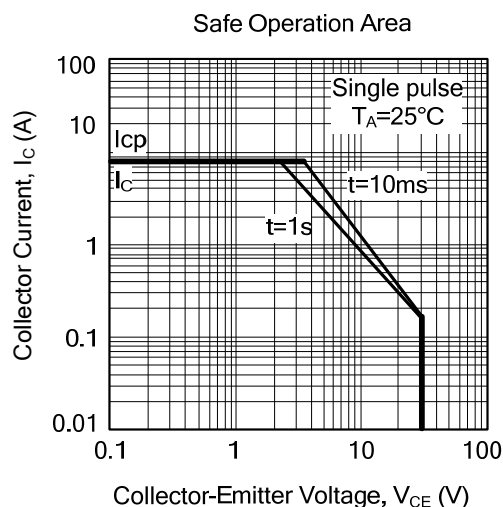
Current Gain-Bandwidth Product



Collector Output Capacitance



■ TYPICAL CHARACTERISTICS



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