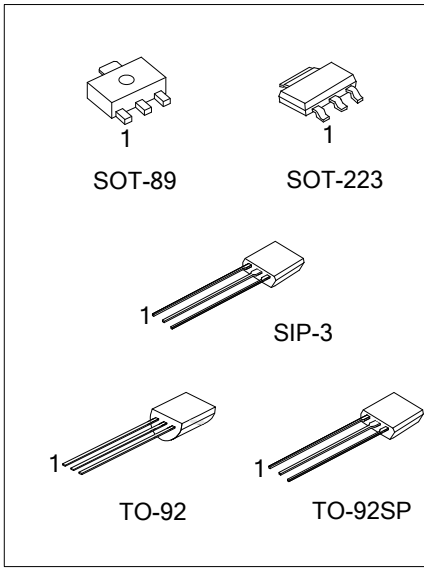
2SD1616/A

NPN SILICON TRANSISTOR

NPN EPITAXIAL SILICON TRANSISTOR



■ DESCRIPTION

* Audio frequency power amplifier
* Medium speed switching

■ ORDERING INFORMATION

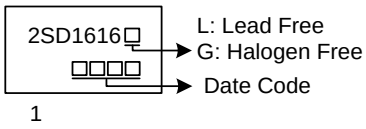
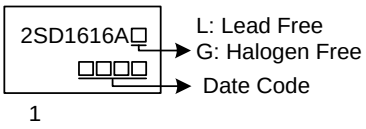
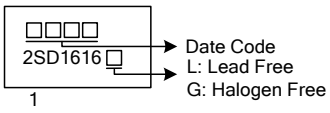
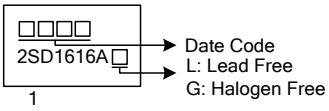
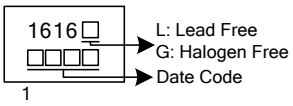
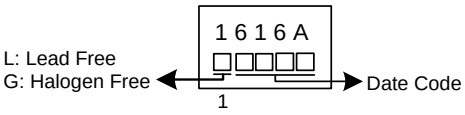
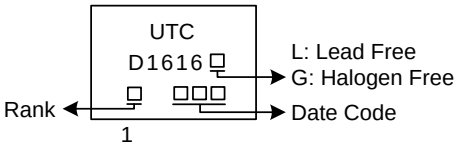
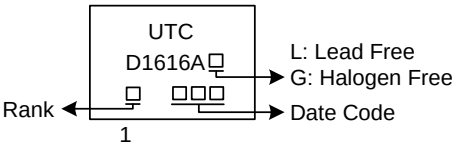
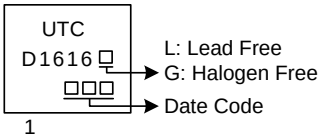
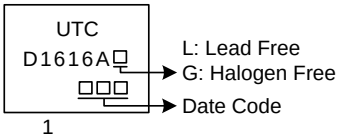
Ordering Number		Package	Pin Assignment			Packing
Lead Free Plating	Halogen-Free		1	2	3	
2SD1616L-x-AA3-B	2SD1616G-x-AA3-B	SOT-223	B	C	E	Tape Reel
2SD1616L-x-AB3-R	2SD1616G-x-AB3-R	SOT-89	B	C	E	Tape Reel
2SD1616L-x-G03-K	2SD1616G-x-G03-K	SIP-3	E	C	B	Bulk
2SD1616L-x-T92-B	2SD1616G-x-T92-B	TO-92	E	C	B	Tape Box
2SD1616L-x-T92-K	2SD1616G-x-T92-K	TO-92	E	C	B	Bulk
2SD1616L-x-T9S-K	2SD1616G-x-T9S-K	TO-92SP	E	C	B	Bulk
2SD1616AL-x-AA3-R	2SD1616AG-x-AA3-R	SOT-223	B	C	E	Tape Reel
2SD1616AL-x-AB3-R	2SD1616AG-x-AB3-R	SOT-89	B	C	E	Tape Reel
2SD1616AL-x-G03-K	2SD1616AG-x-G03-K	SIP-3	E	C	B	Bulk
2SD1616AL-x-T92-B	2SD1616AG-x-T92-B	TO-92	E	C	B	Tape Box
2SD1616AL-x-T92-K	2SD1616AG-x-T92-K	TO-92	E	C	B	Bulk
2SD1616AL-x-T9S-K	2SD1616AG-x-T9S-K	TO-92SP	E	C	B	Bulk

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

2SD1616G-x-AA3-B
- (1)Packing Type
- (2)Packing Type
- (3)Rank
- (4)Green Package

(1) B: Tape Box, K: Bulk, R: Tape Reel
(2) AA3: SOT-223, AB3: SOT-89, G03: SIP-3, T92: TO-92, T9S: TO-92S
(3) x: refer to Classification of h_{FE1}
(4) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING

PACKAGE	MARKING	
	2SD1616	2SD1616A
SOT-223		
SOT-89		
SIP-3		
TO-92		
TO-92SP		

■ ABSOLUTE MAXIMUM RATINGS (T_A=25°C, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Collector to Base Voltage	2SD1616	V_{CBO}	60	V
	2SD1616A		120	
Collector to Emitter Voltage	2SD1616	V_{CEO}	50	V
	2SD1616A		60	
Emitter to Base Voltage		V_{EBO}	6	V
Collector Current	DC	I_C	1	A
	Pulse(Note2)	I_{CM}	2	A
Total Power Dissipation	SOT-223	P_C	800	mW
	SOT-89		500	mW
	SIP-3		400	mW
	TO-92/TO-92SP		750	mW
Junction Temperature		T_J	+150	°C
Storage Temperature		T_{STG}	-55 ~ +150	°C

Notes: 1. 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.
2. Pulse width≤10ms, Duty cycle<50%.

■ ELECTRICAL CHARACTERISTICS (T_A=25°C, unless otherwise specified)

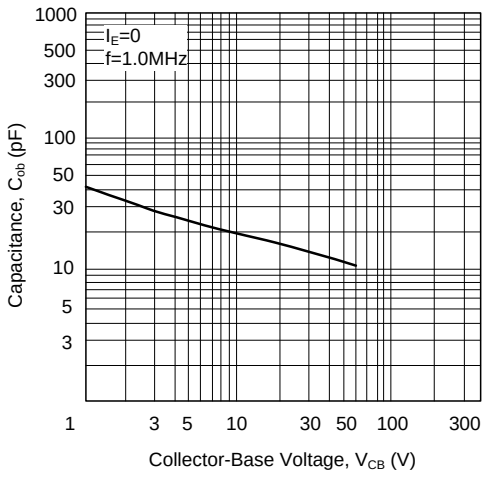
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Collector to Base Breakdown Voltage	2SD1616	BV_{CBO}	I_C=100μA, I_E=0	60			V
	2SD1616A			120			V
Collector to Emitter Breakdown Voltage	2SD1616	BV_{CEO}	I_C=10mA, I_B=0	50			V
	2SD1616A			60			V
Emitter to Base Breakdown Voltage		BV_{EBO}	I_E=10mA, I_C=0	6			V
Collector-Emitter Saturation Voltage		$V_{CE\ (SAT)}$	I_C=1A, I_B=50mA		0.15	0.3	V
Base-Emitter Saturation Voltage		$V_{BE\ (SAT)}$	I_C=1A, I_B=50mA		0.9	1.2	V
Base Emitter On Voltage		$V_{BE\ (ON)}$	V_{CE} =2V, I_C =50mA	600	640	720	mV
Collector Cut-Off Current		I_{CBO}	V_{CB}=60V			100	nA
Emitter Cut-Off Current		I_{EBO}	V_{EB}= 6V			100	nA
DC Current Gain		h_{FE1}	V_{CE} =2V, I_C =100mA	135		600	
		h_{FE2}	V_{CE} =2V, I_C=1A	81			
Transition Frequency		f_T	V_{CE} =2V, I_C =100mA	100	160		MHz
Output Capacitance		C_{ob}	V_{CB} =10V, f =1MHz			19	pF
Turn On Time		t_{ON}	V_{CE} =10V, I_C =100mA		0.07		μs
Storage Time		t_{STG}	I_{B1} = -I_{B2} =10mA		0.95		μs
Fall Time		t_F	$V_{BE(OFF)}$ = -2 ~ -3V		0.07		μs

■ CLASSIFICATION OF h_{FE1}

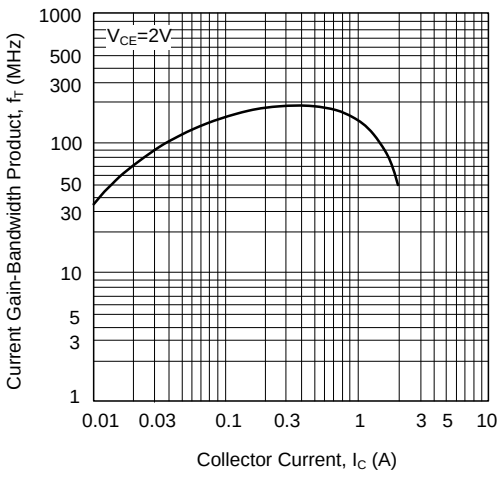
RANK	Y	G	L
h_{FE1}	135 ~ 270	200 ~ 400	300 ~ 600

■ TYPICAL CHARACTERISTICS

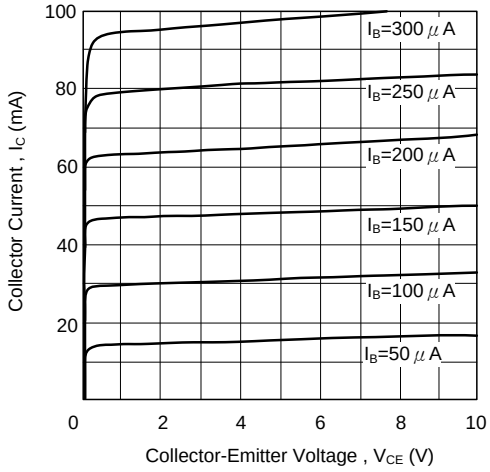
Collector Output Capacitance



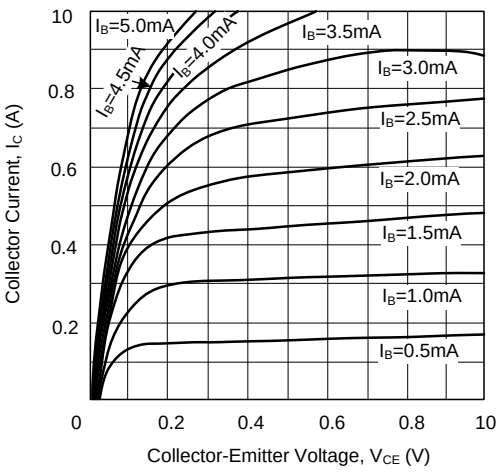
Current Gain-Bandwidth Product



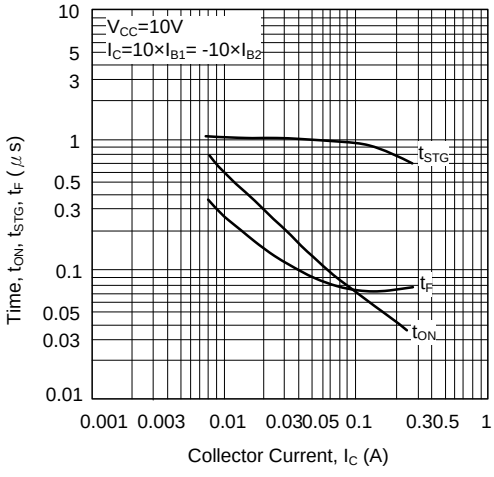
Static Characteristic



Static Characteristic

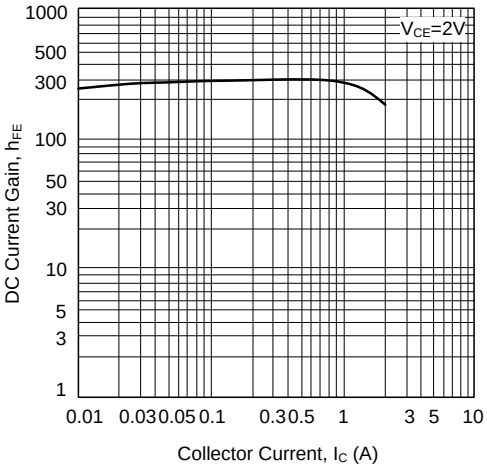


Switching Time

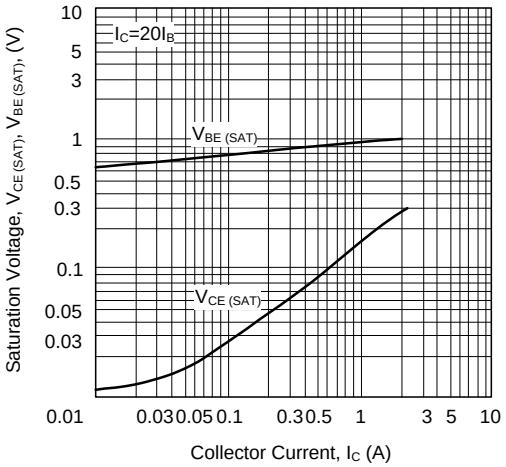


■ TYPICAL CHARACTERISTICS (Cont.)

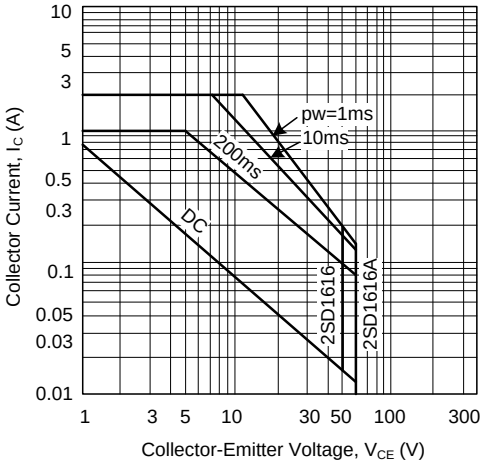
DC Current Gain



Base-Emitter Saturation Voltage
Collector-Emitter Saturation Voltage



Safe Operating Area



Power Derating