



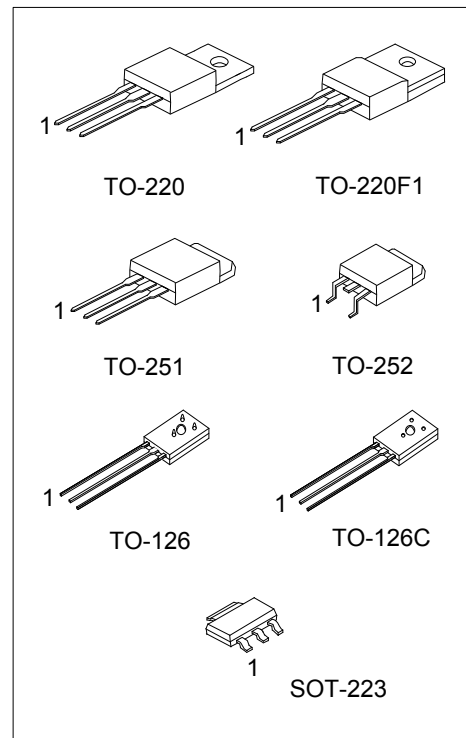
# 2SD1691

## NPN SILICON TRANSISTOR

LOW COLLECTOR  
SATURATION VOLTAGE  
LARGE CURRENT

■ FEATURES

- \*High Power Dissipation
- \*Complementary to 2SB1151



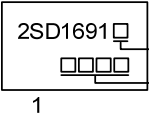
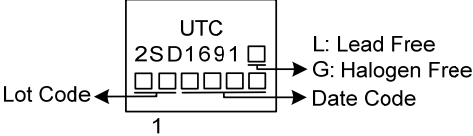
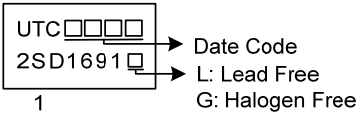
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
2SD1691L-x-AA3-R	2SD1691G-x-AA3-R	SOT-223	B	C	E	Tape Reel
2SD1691L-x-TA3-T	2SD1691G-x-TA3-T	TO-220	B	C	E	Tube
2SD1691L-x-TF1-T	2SD1691G-x-TF1-T	TO-220F1	B	C	E	Tube
2SD1691L-x-TM3-T	2SD1691G-x-TM3-T	TO-251	B	C	E	Tube
2SD1691L-x-TN3-T	2SD1691G-x-TN3-T	TO-252	B	C	E	Tape Reel
2SD1691L-x-T60-K	2SD1691G-x-T60-K	TO-126	E	C	B	Bulk
2SD1691L-x-T6C-K	2SD1691G-x-T6C-K	TO-126C	E	C	B	Bulk

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

<p>2SD1691G-x-AA3-R</p> <p>(1)Packing Type (2)Package Type (3)Rank (4)Green Package</p>	<p>(1) R: Tape Reel, T: Tube, K: Bulk (2) AA3: SOT-223, TA3: TO-220, TF1: TO-220F1, TN3: TO-252, TM3: TO-251, T60: TO-126, T6C: TO-126C (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
SOT-223	 <p>L: Lead Free G: Halogen Free Date Code</p>
TO-220 / TO-220F1 TO-251 / TO-252	 <p>UTC 2SD1691 L: Lead Free G: Halogen Free Date Code Lot Code</p>
TO-126 / TO-126C	 <p>UTC 2SD1691 Date Code L: Lead Free G: Halogen Free</p>

■ ABSOLUTE MAXIMUM RATINGS ( $T_A=25^\circ\text{C}$ , unless otherwise specified)

PARAMETER		SYMBOL	RATING	UNIT
Collector-Base Voltage		$V_{CBO}$	60	V
Collector-Emitter Voltage		$V_{CEO}$	60	V
Emitter-Base Voltage		$V_{EBO}$	7	V
Collector Current	DC	$I_C$	5	A
	Pulse ( $PW \leq 10\text{ms}$ , Duty Cycle $\leq 50\%$ )	$I_{CP}$	8	A
Base Current		$I_B$	1	A
Collector Power Dissipation ( $T_C=25^\circ\text{C}$ )	TO-220	$P_C$	54	W
	TO-220F1		23	W
	SOT-223		9	W
	TO-251/TO-252		36	W
	TO-126/ TO-126C		20	W
Junction Temperature		$T_J$	+150	$^\circ\text{C}$
Storage Temperature Range		$T_{STG}$	-55 ~ +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)

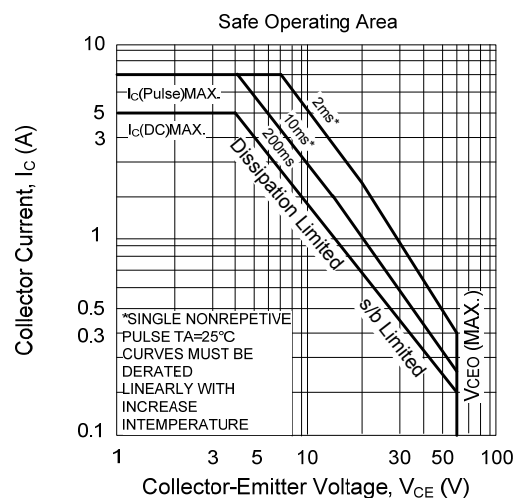
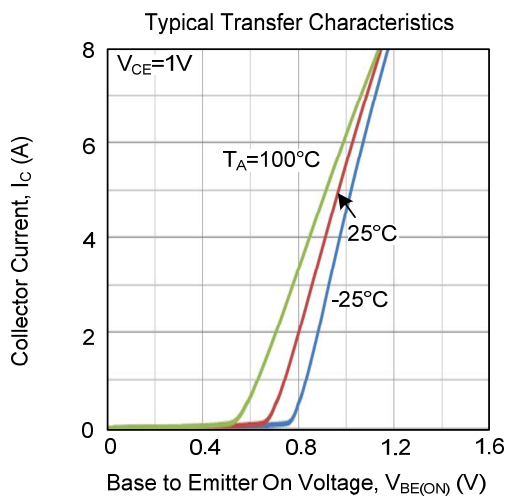
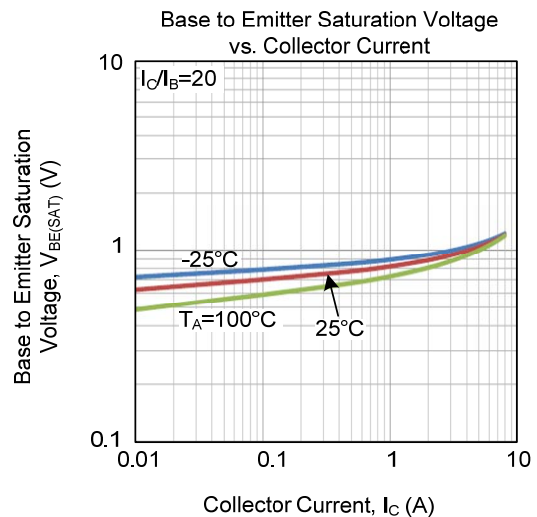
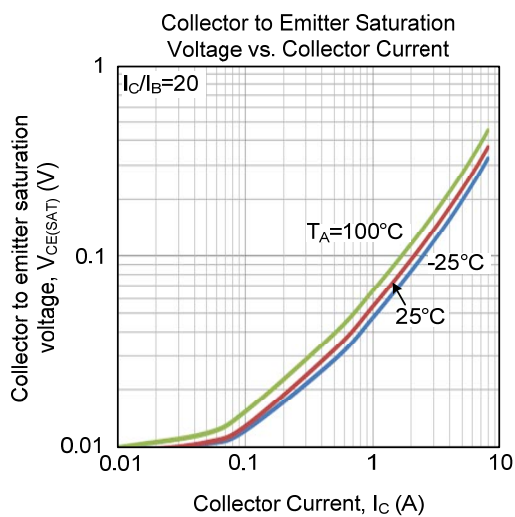
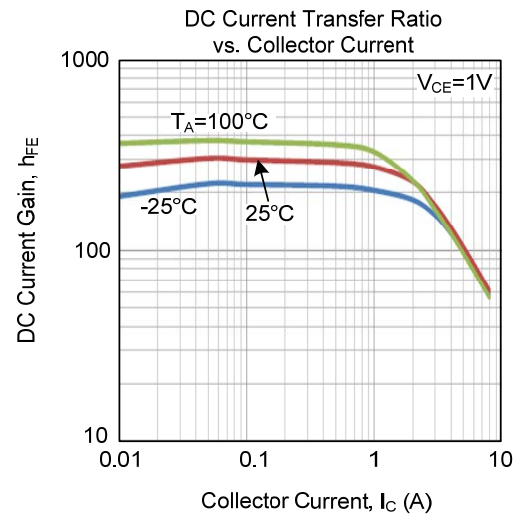
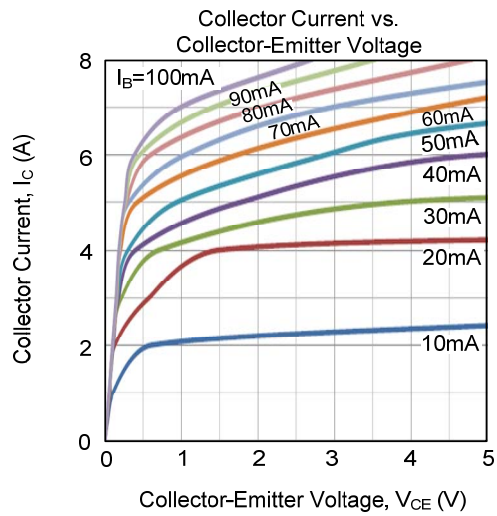
CHARACTERISTIC		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Collector Cut-off Current		$I_{CBO}$	$V_{CB}=50\text{V}, I_E=0$			10	$\mu\text{A}$
Emitter Cut-off Current		$I_{EBO}$	$V_{EB}=7\text{V}, I_C=0$			10	$\mu\text{A}$
DC Current Gain		$h_{FE1}$	$V_{CE}=1\text{V}, I_C=0.1\text{A}$	60			
		$h_{FE2}$	$V_{CE}=1\text{V}, I_C=2\text{A}$	160		400	
		$h_{FE3}$	$V_{CE}=2\text{V}, I_C=5\text{A}$	50			
Collector-Emitter Saturation Voltage		$V_{CE(SAT)}$ (Note)	$I_C=2\text{A}, I_B=0.2\text{A}$		0.1	0.3	V
Base-Emitter Saturation Voltage		$V_{BE(SAT)}$ (Note)	$I_C=2\text{A}, I_B=0.2\text{A}$		0.9	1.2	V
Switching Time	Turn On Time	$T_{ON}$			0.2	1	$\mu\text{s}$
	Storage Time	$T_{STG}$			1.1	2.5	
	Fall Time	$T_F$			0.2	1	

Note: Pulse test:  $P_W \leq 50\mu\text{s}$ , Duty Cycle  $\leq 2\%$  Pulse

■ CLASSIFICATION OF  $h_{FE2}$

RANK	O	Y
RANGE	160-320	200-400

## TYPICAL CHARACTERISTICS



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