



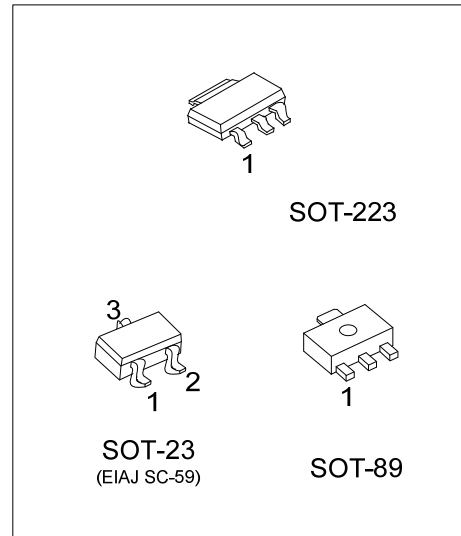
## USS5350

## PNP EPITAXIAL SILICON TRANSISTOR

-50V, -3A PNP LOW  $V_{CE(SAT)}$   
TRANSISTOR

### FEATURES

- \* Low collector-emitter saturation voltage  $V_{CE(SAT)}$
- \* High collector current capability:  $I_C$  and  $I_{CM}$
- \* Higher efficiency leading to less heat generation
- \* Reduced printed-circuit board requirements
- \* Complement: USS4350



### ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
USS5350L-AA3-R	USS5350G-AA3-R	SOT-223	B	C	E	Tape Reel
USS5350L-AB3-R	USS5350G-AB3-R	SOT-89	B	C	E	Tape Reel
USS5350L-AE3-R	USS5350G-AE3-R	SOT-23	B	E	C	Tape Reel

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

<p>USS5350G-AA3-R</p> <p>(1) Packing Type</p> <p>(2) Package Type</p> <p>(3) Green Package</p>	<p>(1) R: Tape Reel</p> <p>(2) AA3: SOT-223, AB3: SOT-89, AE3: SOT-23</p> <p>(3) G: Halogen Free and Lead Free, L: Lead Free</p>
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### MARKING

PACKAGE	MARKING
SOT-223	<p>USS5350□ □□□□ □</p> <p>L: Lead Free G: Halogen Free Date Code</p>
SOT-89	<p>□□□□ USS5350□ □</p> <p>Date Code L: Lead Free G: Halogen Free</p>
SOT-23	<p>ES□ □</p> <p>L: Lead Free G: Halogen Free</p>

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

PARAMETER		SYMBOL	RATINGS	UNIT
Collector-Base Voltage		$V_{CBO}$	-50	V
Collector-Emitter Voltage		$V_{CEO}$	-50	V
Emitter-Base Voltage		$V_{EBO}$	-5	V
Collector Current (Note 2)	DC	$I_C$	-3	A
	Peak	$I_{CM}$	-5	A
Base Current (DC)		$I_B$	-0.5	A
Power Dissipation ( $T_A \leq 25^\circ\text{C}$ )	SOT-89	$P_D$	0.55 (Note 3)	W
			1 (Note 4)	W
			1.4 (Note 5)	W
	SOT-223		0.65 (Note 3)	W
			1.35 (Note 4)	W
	SOT-23		2 (Note 5)	W
			0.35 (Note 3)	W
			0.5 (Note 4)	W
Junction Temperature		$T_J$	+150	$^\circ\text{C}$
Storage Temperature		$T_{STG}$	-65 ~ +150	$^\circ\text{C}$

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 test:  $t_p \leq 300\mu\text{s}$ ; Duty cycle  $\leq 2\%$ .
3. Device mounted on a FR4 printed-circuit board; single-sided copper; tin-plated; standard footprint.
4. Device mounted on a FR4 printed-circuit board; single-sided copper; tin-plated; mounting pad for collector  $1\text{ cm}^2$ .
5. Device mounted on a FR4 printed-circuit board; single-sided copper; tin-plated; mounting pad for collector  $6\text{ cm}^2$ .

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction To Ambient	SOT-89	$\theta_{JA}$	225 (Note 1)	$^\circ\text{C/W}$
			125 (Note 2)	$^\circ\text{C/W}$
			90 (Note 3)	$^\circ\text{C/W}$
	SOT-223		192 (Note 1)	$^\circ\text{C/W}$
			92 (Note 2)	$^\circ\text{C/W}$
	SOT-23		62.5 (Note 3)	$^\circ\text{C/W}$
			357 (Note 1)	$^\circ\text{C/W}$
			250 (Note 2)	$^\circ\text{C/W}$
			227 (Note 3)	$^\circ\text{C/W}$

Notes: 1. Device mounted on a FR4 printed-circuit board; single-sided copper; tin-plated; standard footprint.

2. Device mounted on a FR4 printed-circuit board; single-sided copper; tin-plated; mounting pad for collector  $1\text{ cm}^2$ .

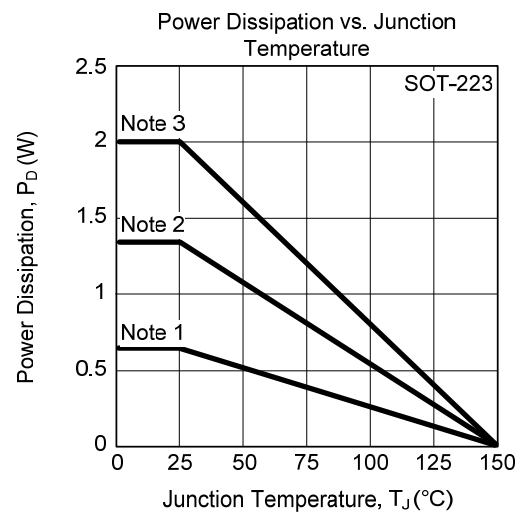
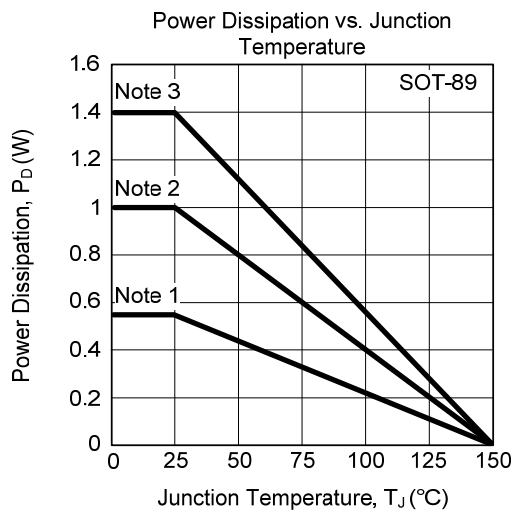
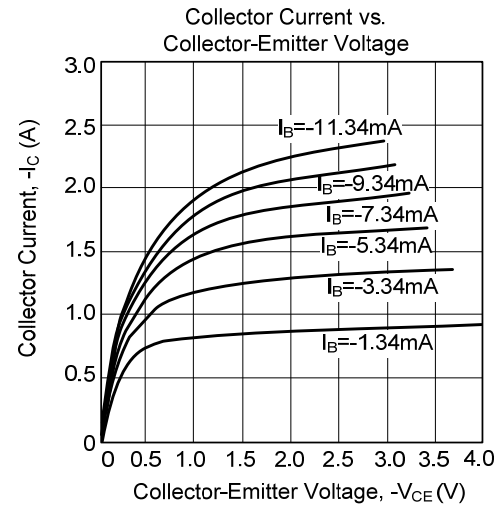
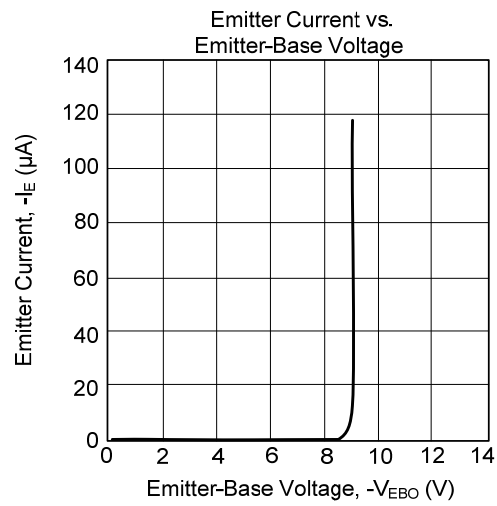
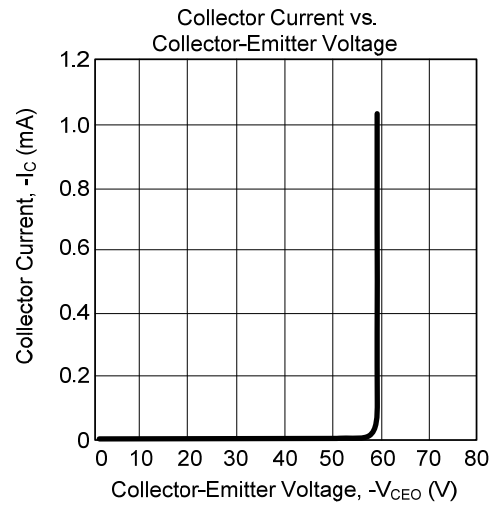
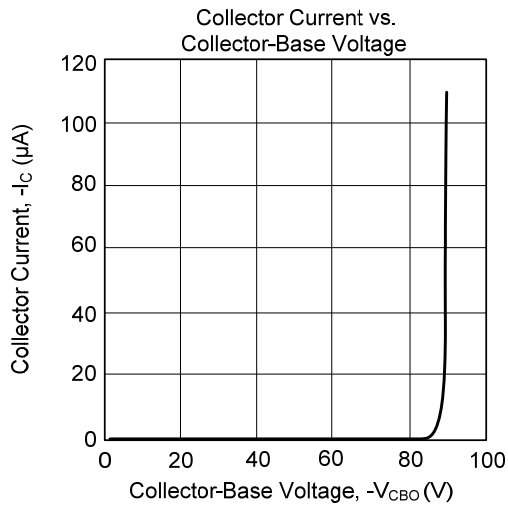
3. Device mounted on a FR4 printed-circuit board; single-sided copper; tin-plated; mounting pad for collector  $6\text{ cm}^2$ .

■ ELECTRICAL CHARACTERISTICS (T<sub>A</sub>=25°C, unless otherwise specified)

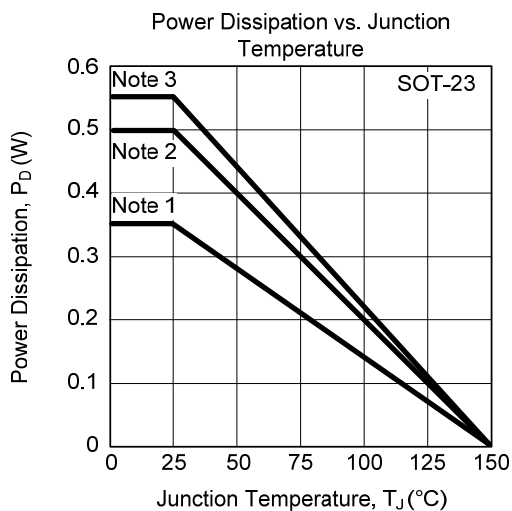
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Collector to Base Breakdown Voltage	BV <sub>CBO</sub>	I <sub>C</sub> =-100μA, I <sub>E</sub> =0	-50			V
Collector to Emitter Breakdown Voltage	BV <sub>CEO</sub>	I <sub>C</sub> =-1mA, I <sub>B</sub> =0	-50			V
Emitter to Base Breakdown Voltage	BV <sub>EBO</sub>	I <sub>E</sub> =-100μA, I <sub>C</sub> =0	-5			V
Collector Cut-Off Current	I <sub>CBO</sub>	V <sub>CB</sub> =-50V, I <sub>E</sub> =0			-100	nA
		V <sub>CB</sub> =-50V, I <sub>E</sub> =0, T <sub>J</sub> =150°C			-50	μA
Collector Cutoff Current	I <sub>CEO</sub>	V <sub>CE</sub> =-50V			-10	μA
Collector Cut-Off Current	I <sub>CES</sub>	V <sub>CE</sub> =-50V, V <sub>BE</sub> =0			-100	nA
Emitter Cut-Off Current	I <sub>EBO</sub>	V <sub>EB</sub> =-5V, I <sub>C</sub> =0			-100	nA
Collector-Emitter Saturation Voltage	V <sub>CE(SAT)</sub>	I <sub>C</sub> =-0.5A, I <sub>B</sub> =-50mA			-90	mV
		I <sub>C</sub> =-1A, I <sub>B</sub> =-50mA			-180	mV
		I <sub>C</sub> =-2A, I <sub>B</sub> =-100mA			-320	mV
		I <sub>C</sub> =-2A, I <sub>B</sub> =-200mA (Note)			-270	mV
		I <sub>C</sub> =-3A, I <sub>B</sub> =-300mA (Note)			-390	mV
Base-Emitter Saturation Voltage	V <sub>BE(SAT)</sub>	I <sub>C</sub> =-2A, I <sub>B</sub> =-100mA			-1.1	V
		I <sub>C</sub> =-3A, I <sub>B</sub> =-300mA (Note)			-1.2	V
Base-Emitter Turn-On Voltage	V <sub>BE(ON)</sub>	V <sub>CE</sub> =-2V, I <sub>C</sub> =-1A	-1.1			V
Dc Current Gain	h <sub>FE</sub>	V <sub>CE</sub> =-2V, I <sub>C</sub> =-0.1A	200			
		V <sub>CE</sub> =-2V, I <sub>C</sub> =-0.5A	200			
		V <sub>CE</sub> =-2V, I <sub>C</sub> =-1A (Note)	200		450	
		V <sub>CE</sub> =-2V, I <sub>C</sub> =-2A (Note)	130			
		V <sub>CE</sub> =-2V, I <sub>C</sub> =-3A (Note)	80			
Equivalent On-Resistance	R <sub>CE(SAT)</sub>	I <sub>C</sub> =-2A, I <sub>B</sub> =-200mA (Note)		90	135	mΩ
Transition Frequency	f <sub>T</sub>	V <sub>CE</sub> =-5V, I <sub>C</sub> =-100mA, f=100MHz	100			MHz
Collector Capacitance	C <sub>C</sub>	V <sub>CB</sub> =-10V, I <sub>E</sub> =I <sub>E</sub> =0, f=1MHz			35	pF

Note: Pulse test: t<sub>p</sub> ≤ 300μs, Duty cycle ≤ 2%.

## TYPICAL CHARACTERISTICS



### ■ TYPICAL CHARACTERISTICS (Cont.)



- Notes:
1. Device mounted on a FR4 printed-circuit board; single-sided copper; tin-plated; standard footprint.
  2. Device mounted on a FR4 printed-circuit board; single-sided copper; tin-plated; mounting pad for collector 1 cm<sup>2</sup>.
  3. Device mounted on a FR4 printed-circuit board; single-sided copper; tin-plated; mounting pad for collector 6 cm<sup>2</sup>.

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