



# USS4350

## NPN SILICON TRANSISTOR

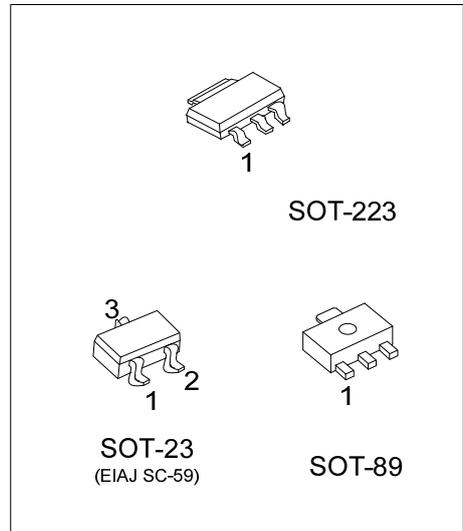
### 50V, 3A NPN LOW $V_{CE(SAT)}$ TRANSISTOR

■ DESCRIPTION

The **UTC USS4350** is a low  $V_{CE(SAT)}$  NPN transistor designed for applications, such as: DC/DC converter, supply line switching, battery charger, linear voltage regulation, driver in low supply voltage applications and inductive load driver.

■ FEATURES

- \* Collector-emitter saturation voltage:50V
- \* High collector current gain ( $h_{FE}$ ) under high  $I_C$  conditions
- \* High collector current capability
- \* Higher efficiency resulting in less heat generation
- \* Complementary to UTC USS5350



■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
USS4350L-AA3-R	USS4350G-AA3-R	SOT-223	B	C	E	Tape Reel
USS4350L-AB3-R	USS4350G-AB3-R	SOT-89	B	C	E	Tape Reel
USS4350L-AE3-R	USS4350G-AE3-R	SOT-23	B	E	C	Tape Reel

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

<p>USS4350G-AA3-R</p> <ul style="list-style-type: none"> <li>(1)Packing Type</li> <li>(2)Package Type</li> <li>(3)Green Package</li> </ul>	<ul style="list-style-type: none"> <li>(1) R: Tape Reel</li> <li>(2) AA3: SOT-223, AB3: SOT-89, AE3: SOT-23</li> <li>(3) G: Halogen Free and Lead Free, L: Lead Free</li> </ul>
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■ MARKING

PACKAGE	MARKING
SOT-223	<ul style="list-style-type: none"> <li>L: Lead Free</li> <li>G: Halogen Free</li> <li>□□□: Date Code</li> </ul>
SOT-89	<ul style="list-style-type: none"> <li>□□□: Data Code</li> <li>L: Lead Free</li> <li>G: Halogen Free</li> </ul>
SOT-23	<ul style="list-style-type: none"> <li>L: Lead Free</li> <li>G: Halogen Free</li> </ul>

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

PARAMETER		SYMBOL	RATINGS	UNIT
Collector-Base Voltage		$V_{CB0}$	60	V
Collector-Emitter Voltage		$V_{CEO}$	50	V
Emitter-Base Voltage		$V_{EBO}$	6	V
Collector Current	DC	$I_C$	3	A
	Peak	$I_{CM}$	5	A
Peak Base Current		$I_{BM}$	1	A
Power Dissipation ( $T_C=25^\circ\text{C}$ ) (Note 2)	SOT-89	$P_D$	1.4	W
	SOT-223		2	
	SOT-23		0.35	
Junction Temperature		$T_J$	150	$^\circ\text{C}$
Operating Temperature		$T_{OPR}$	-65 ~ +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. Device mounted on a printed-circuit board; single sided copper; tinplated; mounting pad for collector 6 cm<sup>2</sup>

■ THERMAL DATA (Note)

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	SOT-89	$\theta_{JA}$	90	$^\circ\text{C/W}$
	SOT-223		62.5	
	SOT-23		357.1	

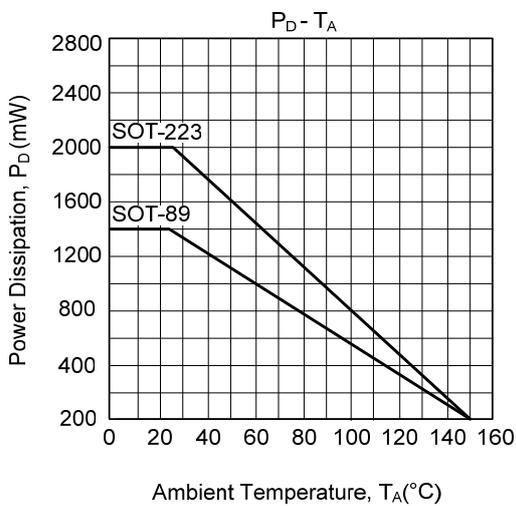
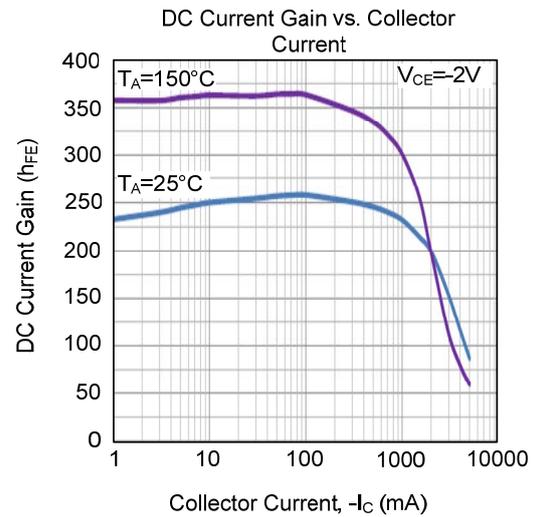
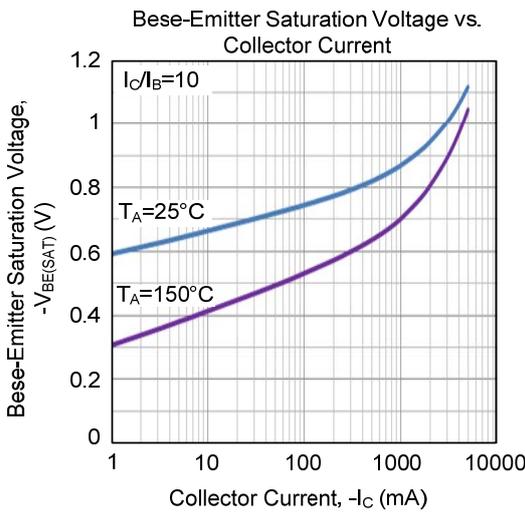
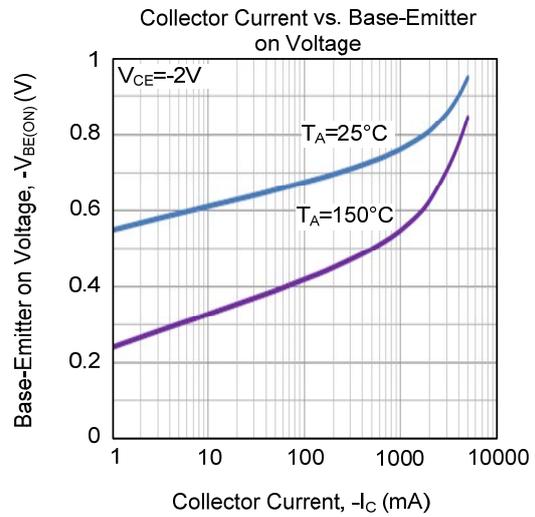
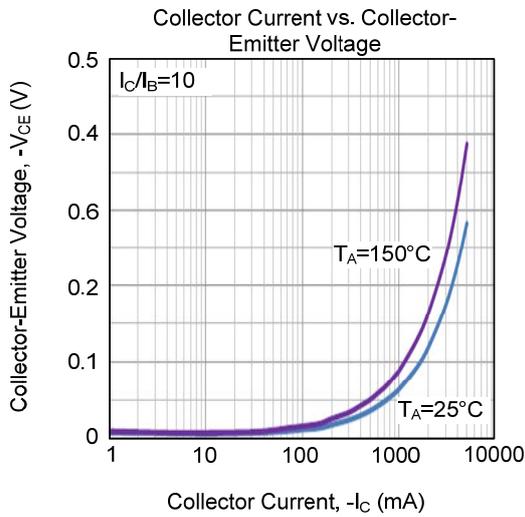
Note: Device mounted on FR-4 substrate  $P_C$  board, 2oz copper, with 1inch square copper plate.

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Collector Cut-off Current	$I_{CB0}$	$V_{CB}=50\text{V}$ , $I_E=0$			100	nA
Emitter Cut-off Current	$I_{EBO}$	$V_{EB}=5\text{V}$ , $I_C=0$			100	nA
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	$I_C=500\text{mA}$ , $I_B=50\text{mA}$			90	mV
		$I_C=1.0\text{A}$ , $I_B=50\text{mA}$			170	mV
		$I_C=2.0\text{A}$ , $I_B=200\text{mA}$ (Note)			290	mV
Base-Emitter Saturation Voltage	$V_{BE(SAT)}$	$I_C=2.0\text{A}$ , $I_B=200\text{mA}$ (Note)			1.2	V
Base-Emitter Turn-On Voltage	$V_{BE(ON)}$	$V_{CE}=2.0\text{V}$ , $I_C=1.0\text{A}$ (Note)			1.1	V
DC Current Gain	$h_{FE1}$	$V_{CE}=2.0\text{V}$ , $I_C=500\text{mA}$	200			
	$h_{FE2}$	$V_{CE}=2.0\text{V}$ , $I_C=1.0\text{A}$ (Note)	200			
	$h_{FE3}$	$V_{CE}=2.0\text{V}$ , $I_C=2.0\text{A}$ (Note)	100			
Equivalent On-Resistance	$R_{CE(SAT)}$	$I_C=2.0\text{A}$ , $I_B=200\text{mA}$ (Note)		110	<145	m $\Omega$
Transition Frequency	$f_T$	$I_C=100\text{mA}$ , $V_{CE}=5.0\text{V}$ , $f=100\text{MHz}$	100			MHz
Collector Capacitance	$C_C$	$V_{CB}=10\text{V}$ , $I_E=I_C=0$ , $f=1\text{MHz}$			30	pF

Note: Pulse test:  $t_p \leq 300\mu\text{s}$ ; Duty cycle  $\leq 2\%$ .

## TYPICAL CHARACTERISTICS



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