



## USS4160T

Preliminary

**NPN SILICON TRANSISTOR**

### 1A, 60V NPN LOW $V_{CE(SAT)}$ TRANSISTOR

#### DESCRIPTION

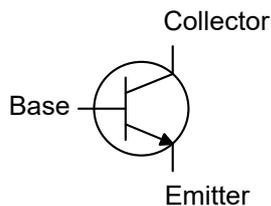
The **USS4160T** is NPN low  $V_{CE(SAT)}$  transistor in a medium power and flat lead SOT-23 Surface-Mounted Device (SMD) plastic package.

PNP complement: USS5160T.

#### FEATURES

- \* Very low collector-emitter saturation voltage  $V_{CE(SAT)}$
- \* High collector current capability  $I_C$  and  $I_{CM}$
- \* High collector current gain ( $h_{FE}$ ) at high  $I_C$
- \* High energy efficiency due to less heat generation

#### EQUIVALENT CIRCUIT



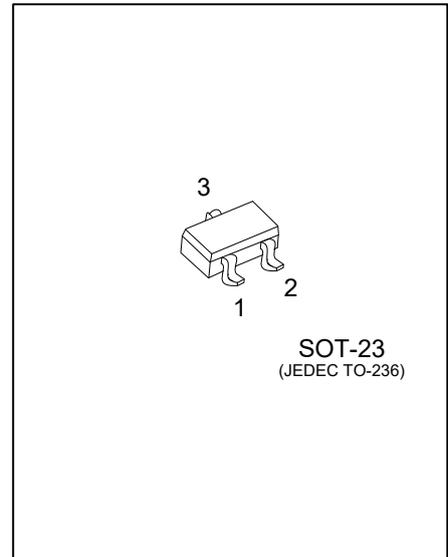
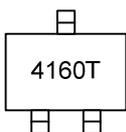
#### ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
USS4160TL-AE3-R	USS4160TG-AE3-R	SOT-23	B	E	C	Tape Reel

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

USS4160TG-AE3-R	(1) Packing Type	(1) R: Tape Reel
	(2) Package Type	(2) AE3: SOT-23
	(3) Green Package	(3) G: Halogen Free and Lead Free, L: Lead Free

#### MARKING



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

PARAMETER	SYMBOL	RATINGS	UNIT
Collector-Base Voltage	$V_{CBO}$	80	V
Collector-Emitter Voltage	$V_{CEO}$	60	V
Emitter-Base Voltage	$V_{EBO}$	5	V
Collector Current	$I_C$	1	A
Peak Collector Current	$I_{CM}$	2	A
Power Dissipation	$P_C$	270	mW
Junction Temperature	$T_J$	+150	$^{\circ}\text{C}$
Storage Temperature	$T_{STG}$	-55 ~ +150	$^{\circ}\text{C}$

Note: 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 an FR4 PCB, single-sided copper, tin-plated and standard footprint.

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	$\theta_{JA}$	465	$^{\circ}\text{C}/\text{W}$

Note: Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Collector-Base Breakdown Voltage	$BV_{CBO}$	$I_C=100\mu\text{A}$ , $I_E=0$	80			V
Collector-Emitter Breakdown Voltage	$BV_{CEO}$	$I_C=1\text{mA}$ , $I_B=0$	60			V
Emitter-Base Breakdown Voltage	$BV_{EBO}$	$I_E=100\mu\text{A}$ , $I_C=0$	5			V
Collector-Base Cut-off Current	$I_{CBO}$	$V_{CB}=60\text{V}$			100	nA
Collector-Emitter Cut-off Current	$I_{CES}$	$V_{CE}=60\text{V}$			100	nA
Emitter-Base Cut-off Current	$I_{EBO}$	$V_{EB}=5\text{V}$			100	nA
Base-Emitter Saturation Voltage	$V_{BE(SAT)}$	$I_C=1\text{A}$ , $I_B=50\text{mA}$			1.1	V
Base-Emitter Turn-On Voltage	$V_{BE(ON)}$	$V_{CE}=5\text{V}$ , $I_C=1\text{A}$			0.9	V
DC Current Gain	$h_{FE}$	$V_{CE}=5\text{V}$ , $I_C=100\text{mA}$	250			
		$V_{CE}=5\text{V}$ , $I_C=500\text{mA}$	200			
		$V_{CE}=5\text{V}$ , $I_C=1\text{A}$	100			
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	$I_C=100\text{mA}$ , $I_B=1\text{mA}$			110	mV
		$I_C=500\text{mA}$ , $I_B=50\text{mA}$			140	mV
		$I_C=1\text{A}$ , $I_B=100\text{mA}$			250	mV
Transition Frequency	$f_T$	$V_{CE}=10\text{V}$ , $I_C=50\text{mA}$ , $f=100\text{MHz}$	150			MHz

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