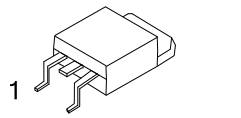
USS4450

NPN SILICON TRANSISTOR

50V, 5A NPN LOW $V_{CE(SAT)}$ TRANSISTOR



TO-252

■ DESCRIPTION

The UTC **USS4450** is a NPN transistor with low $V_{CEsat.}$ It has high collector current I_C, I_{CM} performance. This device can be used in power management applications, such as DC/DC converters, supply line switching, battery charger and linear voltage regulation (LDO) and peripheral drivers, such as driver in low supply voltage applications and inductive load driver.

■ FEATURES

* Less heat dissipation due to high efficiency
* Low collector-emitter saturation voltage
* High collector current capability
* High collector current gain under high collector current condition

■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
USS4450L-TN3-R	USS4450G-TN3-R	TO-252	B	C	E	Tape Reel

USS4450L-TN3-R (1)Packing Type (2)Package Type (3)Lead Free	(1) R: Tape Reel (2) TN3: TO-252 (3) L: Lead Free G: Halogen Free

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

PARAMETER		SYMBOL	RATINGS	UNIT
Collector-Base Voltage		V_{CBO}	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°C) (Note 2)		P_D	1.4	W
Junction Temperature		T_J	150	°C
Operating Temperature		T_{OPR}	+150	°C
Storage Temperature		T_{STG}	-65 ~ +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. Device mounted on a printed-circuit board; single sided copper; tinplated; mounting pad for collector 6 cm^2

■ THERMAL CHARACTERISTICS

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient (Note)	θ_{JA}	62.5	°C/W

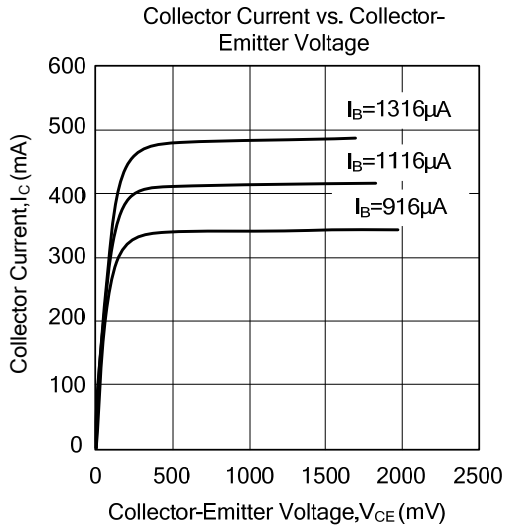
Notes Device mounted on a printed-circuit board; single sided copper; tinplated; mounting pad for collector 6 cm^2. For other mounting conditions see “Thermal considerations for TO-252 in the General Part of associated Handbook”.

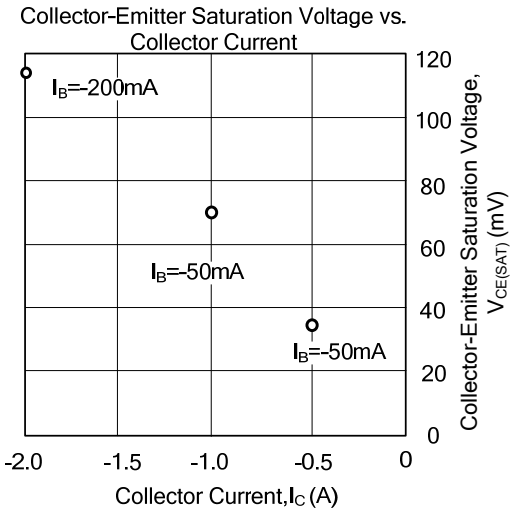
■ ELECTRICAL CHARACTERISTICS T_A = 25 °C unless otherwise specified.

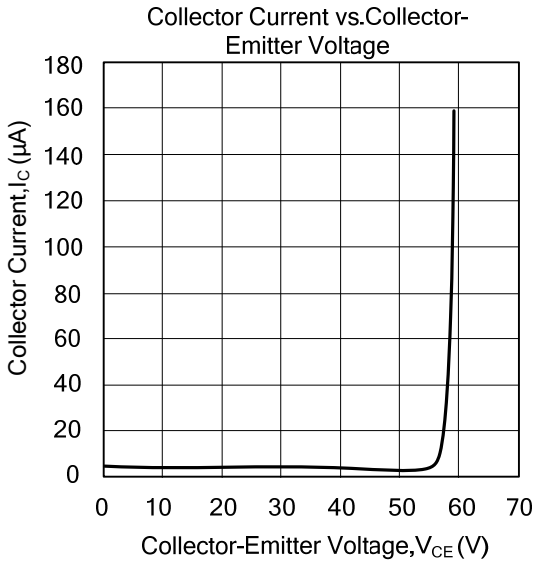
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Collector-Base Cut-Off Current	I_{CBO}	V_{CB} = 50 V, I_E =0			100	nA
		V_{CB} = 50 V, I_E = 0, T_J = 150 °C			50	μA
Emitter-Base Cut-Off Current	I_{EBO}	V_{EB} =5V, I_C =0			100	nA
DC Current Gain	h_{FE}	V_{CE} =2V, I_C = 500 mA	200			
		V_{CE} =2V, I_C = 1 A, (Note 1)	200			
		V_{CE} =2V, I_C = 2 A, (Note 1)	100			
Collector-Emitter Saturation voltage	V_{CEsat}	I_C = 500 mA, I_B =50mA			90	mV
		I_C = 1 A, I_B =50mA			170	mV
		I_C = 2 A, I_B = 200 mA, (Note 1)			290	mV
Equivalent On-Resistance	R_{CEsat}	I_C = 2 A, I_B = 200 mA, (Note 1)		110	145	mΩ
Base-Emitter Saturation voltage	V_{BEsat}	I_C = 2 A, I_B = 200 mA, (Note 1)			1.2	V
Base-Emitter Turn-On Voltage	V_{BEon}	V_{CE} =2V, I_C = 1 A, (Note 1)			1.1	V
Transition Frequency	f_T	I_C = 100 mA, V_{CE} = 5 V, f = 100 MHz	100			MHz
Collector Capacitance	C_c	V_{CB} = 10 V, I_E =Ie = 0, f = 1 MHz			30	pF

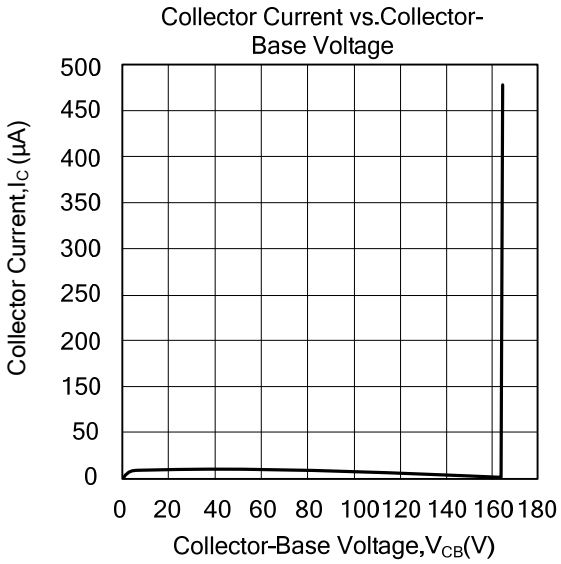
Note 1. Pulse test: $t_p \leqslant 300$ μs, $\delta \leqslant 0.02$.

■ TYPICAL CHARACTERISTICS


Collector Current vs. Collector-Emitter Voltage
Collector Current,I_C (mA)
600
500
400
300
200
100
0
I_B=1316μA
I_B=1116μA
I_B=916μA
0 500 1000 1500 2000 2500
Collector-Emitter Voltage,V_{CE} (mV)


Collector-Emitter Saturation Voltage vs. Collector Current
I_B=-200mA
I_B=-50mA
I_B=-50mA
120
100
80
60
40
20
0
Collector-Emitter Saturation Voltage, $V_{CE(SAT)}$ (mV)
-2.0 -1.5 -1.0 -0.5 0
Collector Current,I_C (A)


Collector Current vs.Collector-Emitter Voltage
Collector Current,I_C (μA)
180
160
140
120
100
80
60
40
20
0
0 10 20 30 40 50 60 70
Collector-Emitter Voltage,V_{CE} (V)


Collector Current vs.Collector-Base Voltage
Collector Current,I_C (μA)
500
450
400
350
300
250
200
150
50
0
0 20 40 60 80 100120 140 160180
Collector-Base Voltage,V_{CB}(V)