



USS4160PANP

Advance

DUAL TRANSISTOR

COMPLEMENTARY NPN/PNP LOW $V_{CE(SAT)}$ TRANSISTOR

DESCRIPTION

The UTC **USS4160PANP** is an NPN and PNP low $V_{CE(SAT)}$ transistor in a leadless medium power DFN2020-6C Surface-Mounted Device (SMD) plastic package.

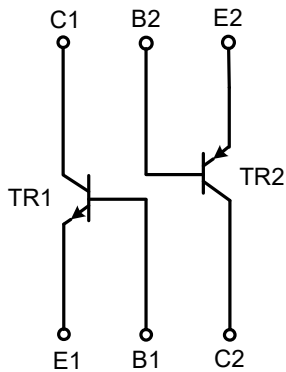
NPN/PNP complement: USS4160PAN

PNP/PNP complement: USS5160PAP

FEATURES

- * NPN/PNP silicon transistor $V_{CE(SAT)}$
- * High collector current capability I_C and I_{CM}
- * High collector current gain h_{FE} at high I_C
- * Reduced Printed-Circuit Board (PCB) requirements
- * High efficiency due to less heat generation
- * Green & Pb Free

EQUIVALENT CIRCUIT

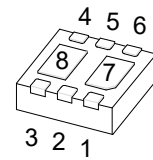


ORDERING INFORMATION

Ordering Number	Package	Pin Assignment								Packing
		1	2	3	4	5	6	7	8	
USS4160PANPG-K06C-2020-R	DFN2020-6C	E1	B1	C2	E2	B2	C1	C1	C2	Tape Reel

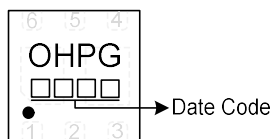
Note: Pin Assignment: E: Emitter B: Base C: Collector

USS4160PANPG-K06C-2020-R	(1)Packing Type	(1) R: Tape Reel
	(2)Package Type	(2) K06C-2020: DFN2020-6C
	(3)Green Package	(3) G: Halogen Free and Lead Free



DFN2020-6C

■ MARKING



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

PARAMETER	SYMBOL	RATINGS		UNIT
		TR1 (NPN)	TR2 (PNP)	
Collector-Base Voltage	V_{CBO}	60	-60	V
Collector-Emitter Voltage	V_{CEO}	60	-60	V
Emitter-Base Voltage	V_{EBO}	7	-7	V
Collector Current	I_C	1	-1	A
Peak Collector Current	I_{CM}	1.5	-1.5	A
Base Current	I_B	0.3	-0.3	A
Collector Power Dissipation	P_C	370		mW
Junction Temperature	T_J	+150		$^{\circ}\text{C}$
Storage Temperature	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.

■ **THERMAL DATA**

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	338	$^{\circ}\text{C/W}$

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

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

TR1 (NPN)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Collector-Base Breakdown Voltage	BV_{CBO}	$I_C=100\mu\text{A}$, $I_E=0$	60			V
Collector-Emitter Breakdown Voltage	BV_{CEO}	$I_C=1\text{mA}$, $I_B=0$	60			V
Emitter-Base Breakdown Voltage	BV_{EBO}	$I_E=100\mu\text{A}$, $I_C=0$	7			V
Collector-Base Cut-off Current	I_{CBO}	$V_{CB}=48\text{V}$, $I_E=0$			100	nA
Emitter-Base Cut-off Current	I_{EBO}	$V_{EB}=5\text{V}$, $I_C=0$			100	nA
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	$I_C=500\text{mA}$, $I_B=50\text{mA}$			120	mV
		$I_C=1\text{A}$, $I_B=50\text{mA}$			240	mV
		$I_C=1\text{A}$, $I_B=100\text{mA}$			220	mV
Base-Emitter Saturation Voltage	$V_{BE(SAT)}$	$I_C=500\text{mA}$, $I_B=50\text{mA}$			1	V
		$I_C=1\text{A}$, $I_B=50\text{mA}$			1.1	V
		$I_C=1\text{A}$, $I_B=100\text{mA}$			1.1	V
Base-Emitter Turn-On Voltage	$V_{BE(ON)}$	$V_{CE}=2\text{V}$, $I_C=0.5\text{A}$			0.9	V
DC Current Gain	h_{FE}	$V_{CE}=2\text{V}$, $I_C=100\text{mA}$	290			
		$V_{CE}=2\text{V}$, $I_C=500\text{mA}$	150			
		$V_{CE}=2\text{V}$, $I_C=1\text{A}$	70			

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

TR2 (PNP)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Collector-Base Breakdown Voltage	BV_{CBO}	$I_C=-100\mu\text{A}$, $I_E=0$	-60			V
Collector-Emitter Breakdown Voltage	BV_{CEO}	$I_C=-1\text{mA}$, $I_B=0$	-60			V
Emitter-Base Breakdown Voltage	BV_{EBO}	$I_E=-100\mu\text{A}$, $I_C=0$	-7			V
Collector-Base Cut-off Current	I_{CBO}	$V_{CB}=-48\text{V}$, $I_E=0$			-100	nA
Emitter-Base Cut-off Current	I_{EBO}	$V_{EB}=-5\text{V}$, $I_C=0$			-100	nA
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	$I_C=-500\text{mA}$, $I_B=-50\text{mA}$			-180	mV
		$I_C=-1\text{A}$, $I_B=-50\text{mA}$			-550	mV
		$I_C=-1\text{A}$, $I_B=-100\text{mA}$			-340	mV
Base-Emitter Saturation Voltage	$V_{BE(SAT)}$	$I_C=-500\text{mA}$, $I_B=-50\text{mA}$			-1	V
		$I_C=-1\text{A}$, $I_B=-50\text{mA}$			-1	V
		$I_C=-1\text{A}$, $I_B=-100\text{mA}$			-1.1	V
Base-Emitter Turn-On Voltage	$V_{BE(ON)}$	$V_{CE}=-2\text{V}$, $I_C=-0.5\text{A}$			-0.9	V
DC Current Gain	h_{FE}	$V_{CE}=-2\text{V}$, $I_C=-100\text{mA}$	170			
		$V_{CE}=-2\text{V}$, $I_C=-500\text{mA}$	120			
		$V_{CE}=-2\text{V}$, $I_C=-1\text{A}$	70			

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