



**UTX440156**

Preliminary

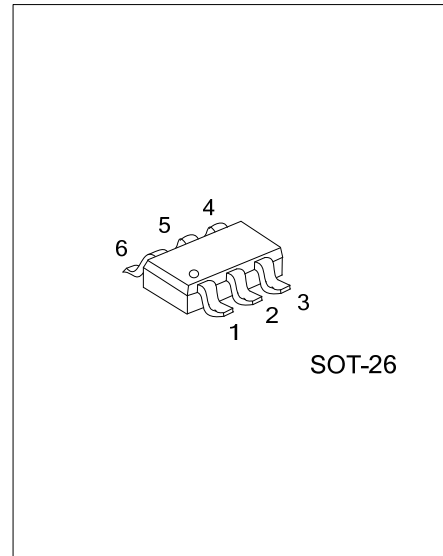
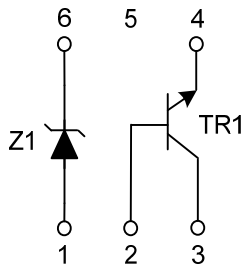
**NPN EPITAXIAL SILICON TRANSISTOR**

**NPN TRANSISTOR WITH ZENER DIODE**

■ FEATURES

- \* Driving Circuit
- \* Switching Applications

■ EQUIVALENT CIRCUIT



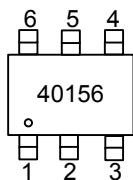
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment						Packing
Lead Free	Halogen Free		1	2	3	4	5	6	
UTX440156L-AG6-R	UTX440156G-AG6-R	SOT-26	A	B	C	E	NC	K	Tape Reel

Note: Pin Assignment: A: Anode B: Base C: Collector E: Emitter NC: Connection K: Cathode

<p>UTX440156G-AG6-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) AG6: SOT-26</li> <li>(3) G: Halogen Free and Lead Free, L: Lead Free</li> </ul>
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■ MARKING



■ ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub>=25°C, unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
<b>NPN TRANSISTOR</b>			
Collector-Base Voltage	V <sub>CBO</sub>	60	V
Collector-Emitter Voltage	V <sub>CEO</sub>	40	V
Emitter-Base Voltage	V <sub>EBO</sub>	6	V
Collector Current - Continuous	I <sub>C</sub>	600	mA
Power Dissipation	P <sub>D</sub>	380	mW
Junction Temperature	T <sub>J</sub>	+150	°C
Storage Temperature	T <sub>STG</sub>	-55 ~ +150	°C
<b>ZENER DIODE</b>			
Forward Voltage (I <sub>F</sub> =10mA)	V <sub>F</sub>	0.9	V

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 <sub>JA</sub>	328	°C/W

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

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>NPN TRANSISTOR</b>						
<b>OFF CHARACTERISTICS</b>						
Collector-Base Breakdown Voltage	V <sub>(BR)CBO</sub>	I <sub>C</sub> =0.1mA, I <sub>E</sub> =0	60			V
Collector-Emitter Breakdown Voltage	V <sub>(BR)CEO</sub>	I <sub>C</sub> =1.0mA, I <sub>B</sub> =0	40			V
Emitter-Base Breakdown Voltage	V <sub>(BR)EBO</sub>	I <sub>E</sub> =0.1mA, I <sub>C</sub> =0	6			V
Base Cutoff Current	I <sub>BEV</sub>	V <sub>CE</sub> =35V, V <sub>EB</sub> =0.4V			0.1	μA
Collector Cut-off Current	I <sub>CEX</sub>	V <sub>CE</sub> =35V, V <sub>EB</sub> =0.4V			0.1	μA
<b>ON CHARACTERISTICS</b>						
DC Current Gain	h <sub>FE</sub>	I <sub>C</sub> =0.1mA, V <sub>CE</sub> =1.0V	20			
		I <sub>C</sub> =1.0mA, V <sub>CE</sub> =1.0V	40			
		I <sub>C</sub> =10mA, V <sub>CE</sub> =1.0V	80			
		I <sub>C</sub> =150mA, V <sub>CE</sub> =1.0V	100	300		
		I <sub>C</sub> =500mA, V <sub>CE</sub> =2.0V	40			
Collector-Emitter Saturation Voltage	V <sub>CE(SAT)</sub>	I <sub>C</sub> =150mA, I <sub>B</sub> =15mA			0.4	V
		I <sub>C</sub> =500mA, I <sub>B</sub> =50mA			0.75	V
Base-Emitter Saturation Voltage	V <sub>BE(SAT)</sub>	I <sub>C</sub> =150mA, I <sub>B</sub> =15mA	0.75		0.95	V
		I <sub>C</sub> =500mA, I <sub>B</sub> =50mA			1.2	V
<b>SMALL SIGNAL CHARACTERISTICS</b>						
Current Gain-Bandwidth Product	f <sub>T</sub>	V <sub>CE</sub> =20V, I <sub>C</sub> =10mA, f=100MHz		250		MHz
Collector-Base Capacitance	C <sub>cb</sub>	V <sub>CB</sub> =5.0V, I <sub>E</sub> =0, f=1.0MHz		4.2		pF
Emitter-Base Capacitance	C <sub>eb</sub>	V <sub>EB</sub> =0.5V, I <sub>C</sub> =0, f=1.0MHz		43		pF
Delay Time	t <sub>d</sub>	V <sub>CC</sub> =30V, V <sub>EB</sub> =2.0V, I <sub>C</sub> =150mA,			15	ns
Rise Time	t <sub>r</sub>	I <sub>B1</sub> =15mA			20	ns
Storage Time	t <sub>s</sub>	V <sub>CC</sub> =30V, I <sub>C</sub> =150mA,			225	ns
Fall Time	t <sub>f</sub>	I <sub>B1</sub> = I <sub>B2</sub> =15mA			30	ns

Note: Pulse test: Pulse width ≤ 300μs, Duty Cycle ≤ 2.0%.

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

(V<sub>F</sub> = 0.9V Max @ I<sub>F</sub> = 10mA for all types.)

Part Number	Nominal Zener Voltage				Max Zener Impedance				Max Reverse Leakage Current (Note)	
	V <sub>Z</sub> @ I <sub>ZT</sub> (V)			I <sub>ZT</sub>	Z <sub>ZT</sub> @ I <sub>ZT</sub>		Z <sub>ZK</sub> @ I <sub>ZK</sub>		I <sub>R</sub>	@V <sub>R</sub>
	MIN	TYP	MAX	mA	(Ω)	mA	(Ω)	mA	(μA)	(V)
UTX440156	5.49	5.6	5.71	5.0	40	5.0	400	1.00	0.1	1.0

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