- **Power-On Reset Generator**
- **Automatic Reset Generation After Voltage Drop**
- **Low Standby Current . . . 20 μA**
- **$\overline{\text{RESET}}$ Output Defined When V_{CC} Exceeds 1 V**
- **Precision Threshold Voltage 4.55 V $\pm$120 mV**
- **High Output Sink Capability . . . 20 mA**
- **Comparator Hysteresis Prevents Erratic Resets**

D PACKAGE
(TOP VIEW)

$\overline{\text{RESET}}$	1	8 NC
V_{CC}	2	7 NC
NC	3	6 NC
GND	4	5 NC

NC – No internal connection

LP PACKAGE
(TOP VIEW)

GND
V_{CC}
$\overline{\text{RESET}}$

PK PACKAGE
(TOP VIEW)

$\overline{\text{RESET}}$
GND
V_{CC}

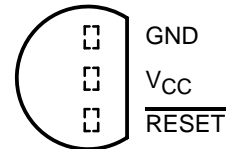GND is in electrical contact with the tab.

description/ordering information

The TL7757 is a supply-voltage supervisor designed for use in microcomputer and microprocessor systems. The supervisor monitors the supply voltage for undervoltage conditions. During power up, when the supply voltage, V_{CC}, attains a value approaching 1 V, the $\overline{\text{RESET}}$ output becomes active (low) to prevent undefined operation. If the supply voltage drops below threshold voltage level (V_{IT-}), the $\overline{\text{RESET}}$ output goes to the active (low) level until the supply undervoltage fault condition is eliminated.

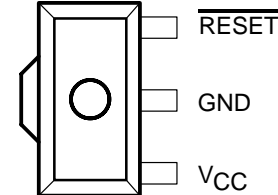### ORDERING INFORMATION

T_A	PACKAGE†		ORDERABLE PART NUMBER	TOP-SIDE MARKING
0°C to 70°C	SOIC (D)	Tube of 75	TL7757CD	7757C
		Reel of 2500	TL7757CDR	
	SOT (PK)	Reel of 1000	TL7757CPK	T7
	TO-92 (LP)	Bulk of 1000	TL7757CLP	TL7757C
		Reel of 2000	TL7757CLPR	
−40°C to 85°C	SOIC (D)	Tube of 75	TL7757ID	7757I
		Reel of 2500	TL7757IDR	
	SOT (PK)	Reel of 1000	TL7757IPK	7I
	TO-92 (LP)	Bulk of 1000	TL7757ILP	TL7757I
		Reel of 2000	TL7757ILPR	

† Package drawings, standard packing quantities, thermal data, symbolization, and PCB design guidelines are available at www.ti.com/sc/package.

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equivalent schematic

ACTUAL DEVICE COMPONENT COUNT	
Transistors	27
Resistors	20
Capacitors	2

absolute maximum ratings over operating free-air temperature (unless otherwise noted)†

Supply voltage range, V_{CC} (see Note 1) . . . . −0.3 V to 20 V

Off-state output voltage range (see Note 1) . . . . −0.3 V to 20 V

Output current, I_O . . . . 30 mA

Package thermal impedance, θ_{JA} (see Notes 2 and 3): D package . . . . 97°C/W

LP package . . . . 156°C/W

PK package . . . . 52°C/W

Lead temperature 1,6 mm (1/16 inch) from case for 10 seconds . . . . 260°C

Storage temperature range, T_{stg} . . . . −65°C to 150°C

† Stresses beyond those listed under "absolute maximum ratings" may cause permanent damage to the device. These are stress ratings only, and
functional operation of the device at these or any other conditions beyond those indicated under "recommended operating conditions" is not
implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

NOTES: 1. All voltage values are with respect to network terminal ground.
2. Maximum power dissipation is a function of $T_J(max)$, θ_{JA}, and T_A. The maximum allowable power dissipation at any allowable
ambient temperature is $P_D = (T_J(max) - T_A)/\theta_{JA}$. Operating at the absolute maximum T_J of 150°C can affect reliability.
3. The package thermal impedance is calculated in accordance with JESD 51-7.

recommended operating conditions

			MIN	MAX	UNIT
Supply voltage, V_{CC}			1	7	V
High-level output voltage, V_{OH}				15	V
Low-level output current, I_{OL}				20	mA
Operating free-air temperature, T_A		TL7757C	0	70	°C
		TL7757I	−40	85	

electrical characteristics at specified free-air temperature

PARAMETER		TEST CONDITIONS	T_A	TL7757C			UNIT
				MIN	TYP	MAX	
V_{IT-}	Negative-going input threshold voltage at V_{CC}		25°C	4.43	4.55	4.67	V
			0°C to 70°C	4.4		4.7	
V_{hys}†	Hysteresis at V_{CC}		25°C	40	50	60	mV
			0°C to 70°C	30		70	
V_{OL}	Low-level output voltage	I_{OL} = 20 mA, V_{CC} = 4.3 V	25°C		0.4	0.8	V
			0°C to 70°C			0.8	
I_{OH}	High-level output current	V_{CC} = 7 V, V_{OH} = 15 V, See Figure 1	25°C			1	µA
			0°C to 70°C			1	
V_{res}‡	Power-up reset voltage	R_L = 2.2 kΩ, V_{CC} slew rate ≤ 5 V/µs	25°C		0.8	1	V
			0°C to 70°C			1.2	
I_{CC}	Supply current	V_{CC} = 4.3 V	25°C		1400	2000	µA
			0°C to 70°C			2000	
		V_{CC} = 5.5 V	0°C to 70°C			40	

† This is the difference between positive-going input threshold voltage, V_{IT+}, and negative-going input threshold voltage, V_{IT-}.
‡ This is the lowest voltage at which $\overline{RESET}$ becomes active.

switching characteristics at specified free-air temperature

PARAMETER		TEST CONDITIONS	T_A	TL7757C			UNIT
				MIN	TYP	MAX	
t_{PLH}	Propagation delay time, low-to-high-level output	V_{CC} slew rate ≤ 5 V/µs, See Figures 2 and 3	25°C		3.4	5	µs
			0°C to 70°C			5	
t_{PHL}	Propagation delay time, high-to-low-level output	See Figures 2 and 3	25°C		2	5	µs
			0°C to 70°C			5	
t_r	Rise time	V_{CC} slew rate ≤ 5 V/µs, See Figures 2 and 3	25°C		0.4	1	µs
			0°C to 70°C			1	
t_f	Fall time	See Figures 2 and 3	25°C		0.05	1	µs
			0°C to 70°C			1	
$t_{w(min)}$	Minimum pulse duration at V_{CC} for output response		25°C			5	µs
			0°C to 70°C			5	

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electrical characteristics at specified free-air temperature

	PARAMETER	TEST CONDITIONS	T_A	TL7757I			UNIT
				MIN	TYP	MAX	
V_{IT-}	Negative-going input threshold voltage at V_{CC}		25°C	4.43	4.55	4.67	V
			−40°C to 85°C	4.4		4.7	
V_{hys}†	Hysteresis at V_{CC}		25°C	40	50	60	mV
			−40°C to 85°C	30		70	
V_{OL}	Low-level output voltage	I_{OL} = 20 mA, V_{CC} = 4.3 V	25°C		0.4	0.8	V
			−40°C to 85°C			0.8	
I_{OH}	High-level output current	V_{CC} = 7 V, V_{OH} = 15 V, See Figure 1	25°C			1	µA
			−40°C to 85°C			1	
V_{res}‡	Power-up reset voltage	R_L = 2.2 kΩ, V_{CC} slew rate ≤ 5 V/µs	25°C		0.8	1	V
			−40°C to 85°C			1.2	
I_{CC}	Supply current	V_{CC} = 4.3 V	25°C		1400	2000	µA
			−40°C to 85°C			2100	
		V_{CC} = 5.5 V	−40°C to 85°C			40	

† This is the difference between positive-going input threshold voltage, V_{IT+}, and negative-going input threshold voltage, V_{IT-}.
‡ This is the lowest voltage at which $\overline{RESET}$ becomes active.

switching characteristics at specified free-air temperature

	PARAMETER	TEST CONDITIONS	T_A	TL7757I			UNIT
				MIN	TYP	MAX	
t_{PLH}	Propagation delay time, low-to-high-level output	V_{CC} slew rate ≤ 5 V/µs, See Figures 2 and 3	25°C		3.4	5	µs
			−40°C to 85°C			5	
t_{PHL}	Propagation delay time, high-to-low-level output	See Figures 2 and 3	25°C		2	5	µs
			−40°C to 85°C			5	
t_r	Rise time	V_{CC} slew rate ≤ 5 V/µs, See Figures 2 and 3	25°C		0.4	1	µs
			−40°C to 85°C			1	
t_f	Fall time	See Figures 2 and 3	25°C		0.05	1	µs
			−40°C to 85°C			1	
$t_{w(min)}$	Minimum pulse duration at V_{CC} for output response		25°C			5	µs
			−40°C to 85°C			5	

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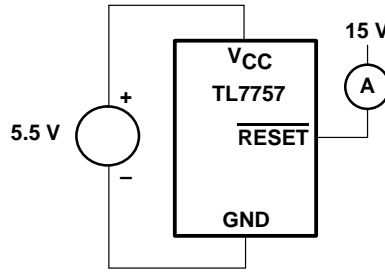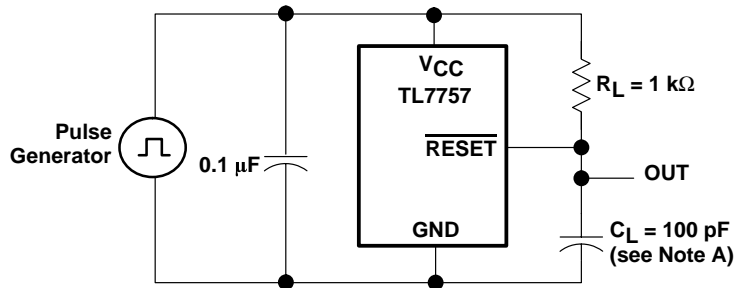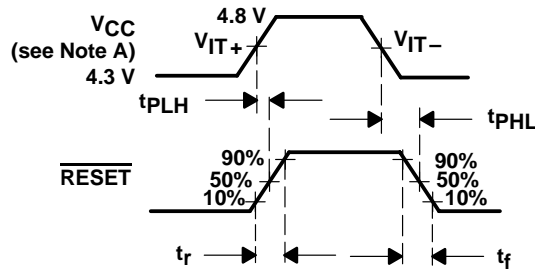
PARAMETER MEASUREMENT INFORMATION

Figure 1. Test Circuit for Output Leakage Current

NOTE A: Includes jig and probe capacitance

Figure 2. Test Circuit for $\overline{\text{RESET}}$ Output Switching Characteristics

NOTE A: V_{CC} slew rate ≤ 5 µs

Figure 3. Switching Diagram

TYPICAL CHARACTERISTICS†

Table of Graphs

		FIGURE
V_{CC}	Supply voltage vs $\overline{\text{RESET}}$ output voltage	4
I_{CC}	Supply current vs Supply voltage	5
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V_{OL}	Low-level output voltage vs Low-level output current	7
V_{OL}	Low-level output voltage vs Free-air temperature	8
I_{OL}	Output current vs Supply voltage	9
V_{IT-}	Input threshold voltage (negative-going V_{CC}) vs Free-air temperature	10
V_{res}	Power-up reset voltage vs Free-air temperature	11
V_{res}	Power-up reset voltage and supply voltage vs Time	12
	Propagation delay time	13

SUPPLY VOLTAGE
vs
$\overline{\text{RESET}}$ OUTPUT VOLTAGE
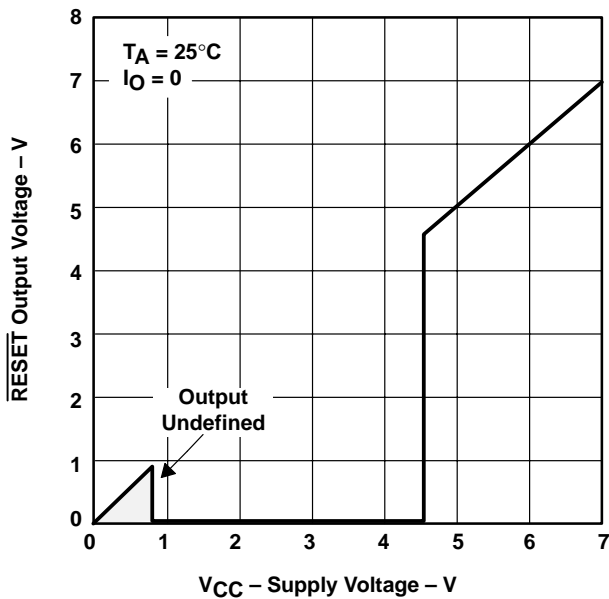
Figure 4

SUPPLY CURRENT
vs
SUPPLY VOLTAGE
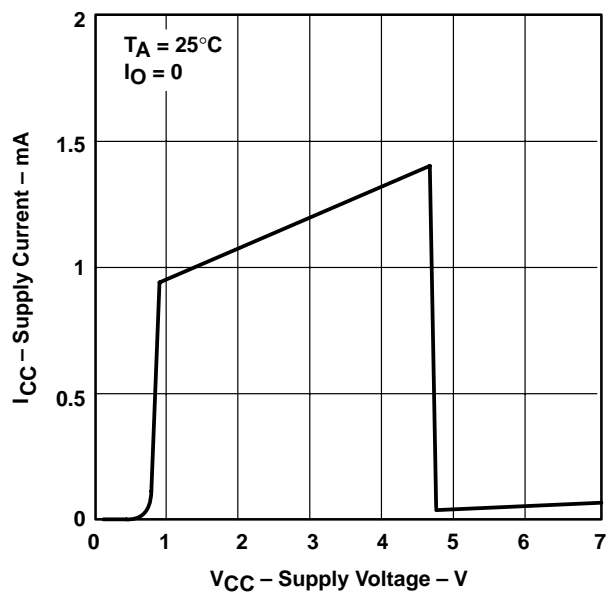
Figure 5

† Data at high and low temperatures are applicable only within the rated operating free-air temperature ranges of the various devices.
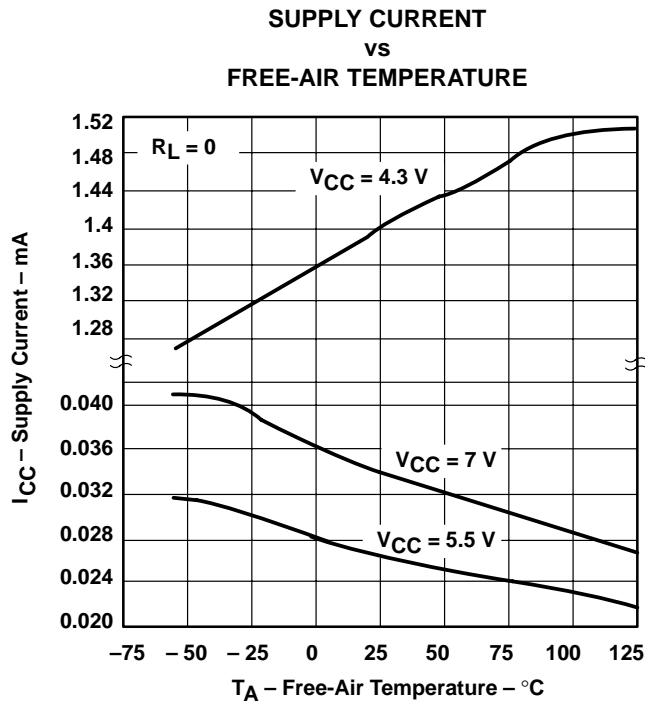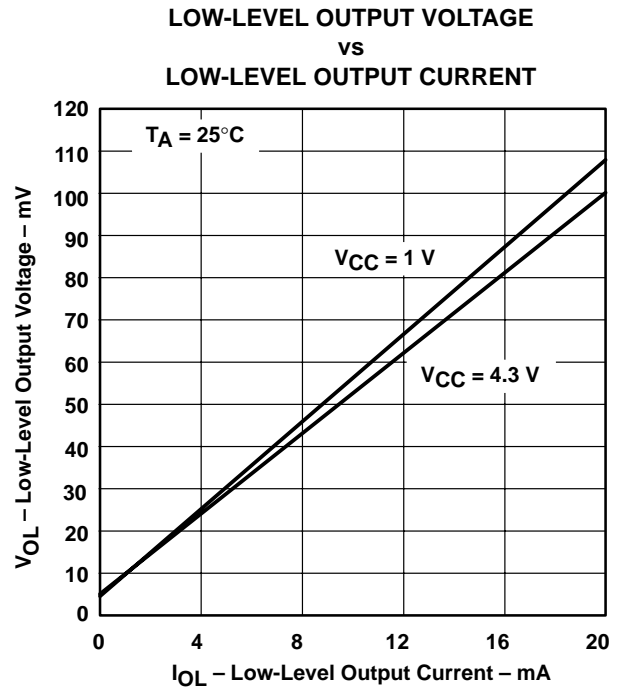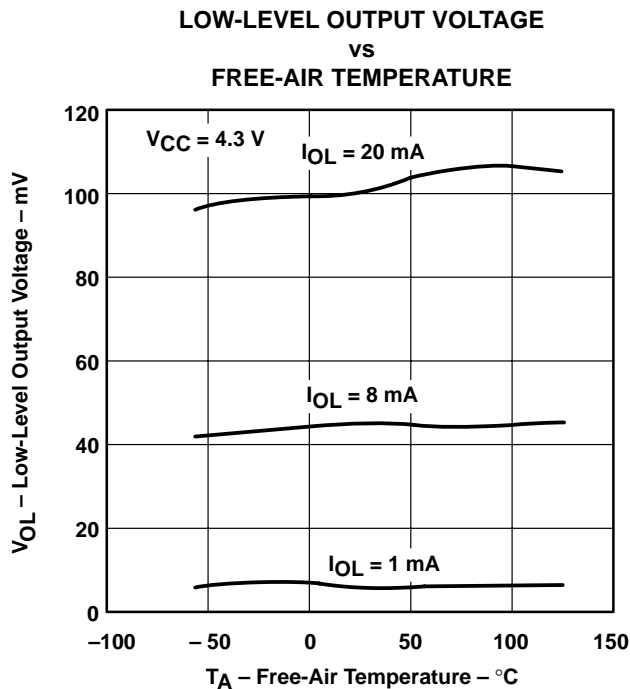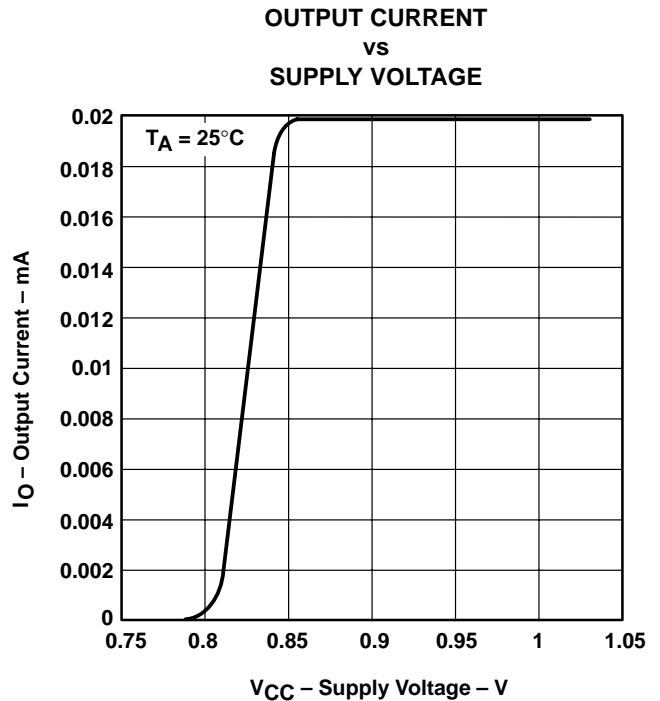
TYPICAL CHARACTERISTICS†

SUPPLY CURRENT
vs
FREE-AIR TEMPERATURE

Figure 6

LOW-LEVEL OUTPUT VOLTAGE
vs
LOW-LEVEL OUTPUT CURRENT

Figure 7

LOW-LEVEL OUTPUT VOLTAGE
vs
FREE-AIR TEMPERATURE

Figure 8

OUTPUT CURRENT
vs
SUPPLY VOLTAGE

Figure 9

† Data at high and low temperatures are applicable only within the rated operating free-air temperature ranges of the various devices.

TYPICAL CHARACTERISTICS†

INPUT THRESHOLD VOLTAGE
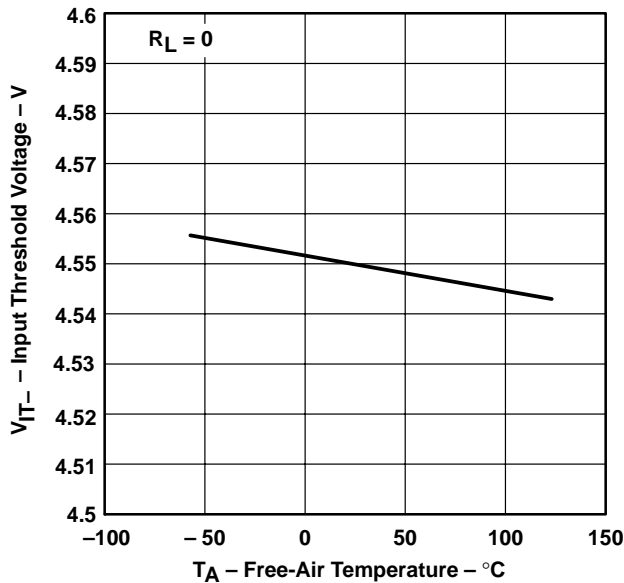(NEGATIVE-GOING V_{CC})
vs
FREE-AIR TEMPERATURE

Figure 10

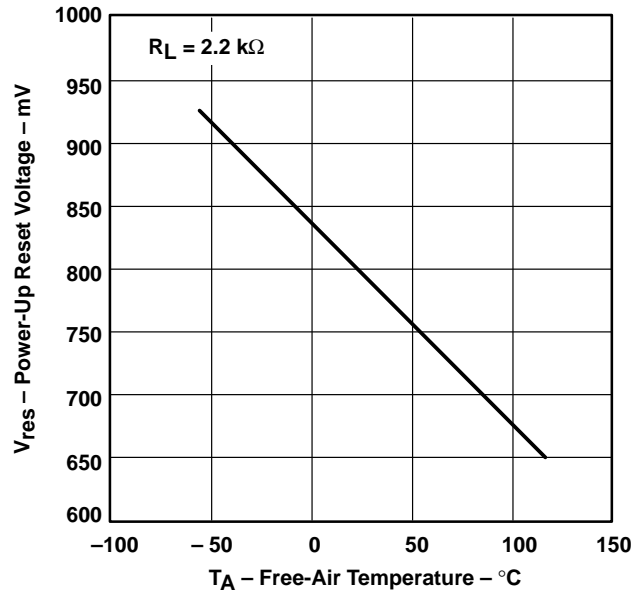POWER-UP RESET VOLTAGE
vs
FREE-AIR TEMPERATURE

Figure 11

POWER-UP RESET VOLTAGE
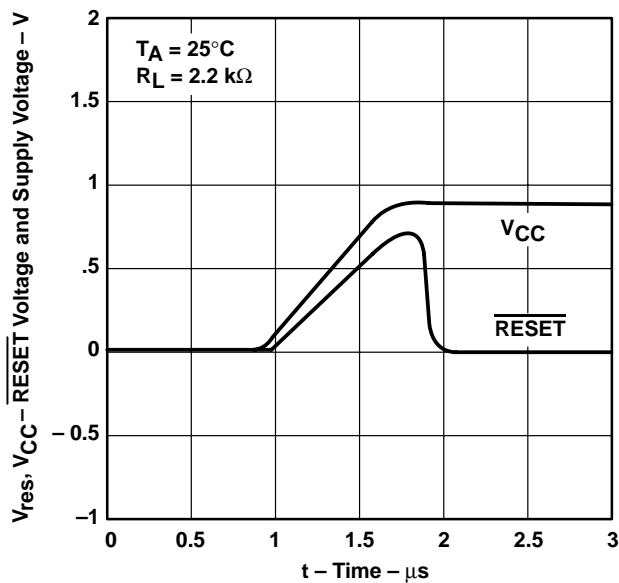AND SUPPLY VOLTAGE
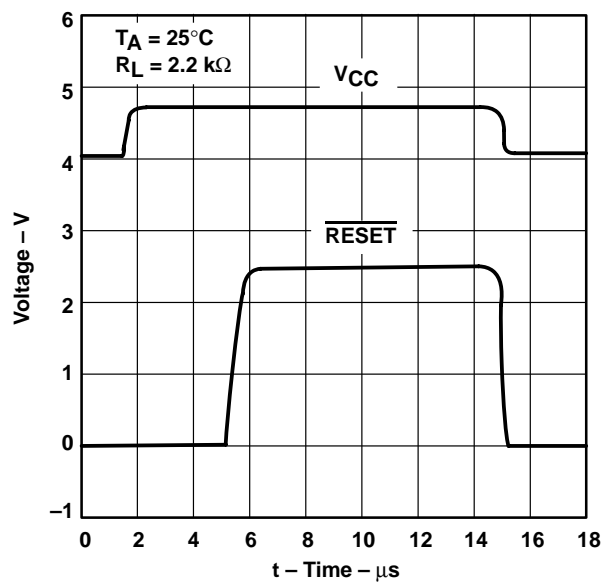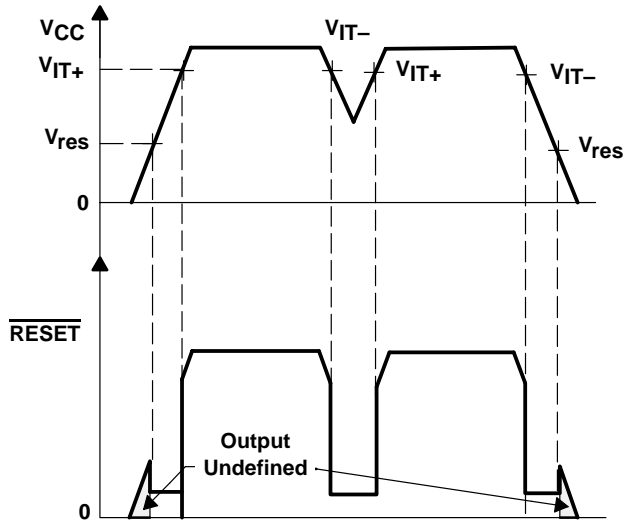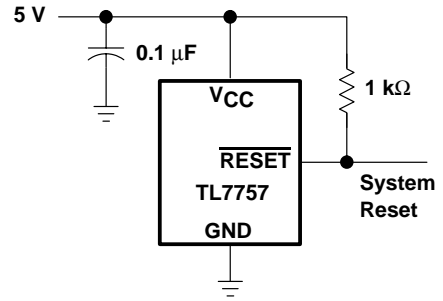vs
TIME

Figure 12

PROPAGATION DELAY TIME

Figure 13

† Data at high and low temperatures are applicable only within the rated operating free-air temperature ranges of the various devices.

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APPLICATION INFORMATION

TYPICAL TIMING DIAGRAM

TYPICAL APPLICATION DIAGRAM

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