SOLID STATE OPTRONICS

SDT800-F8

DC Input
80V
Dual Channel Optocoupler

Description

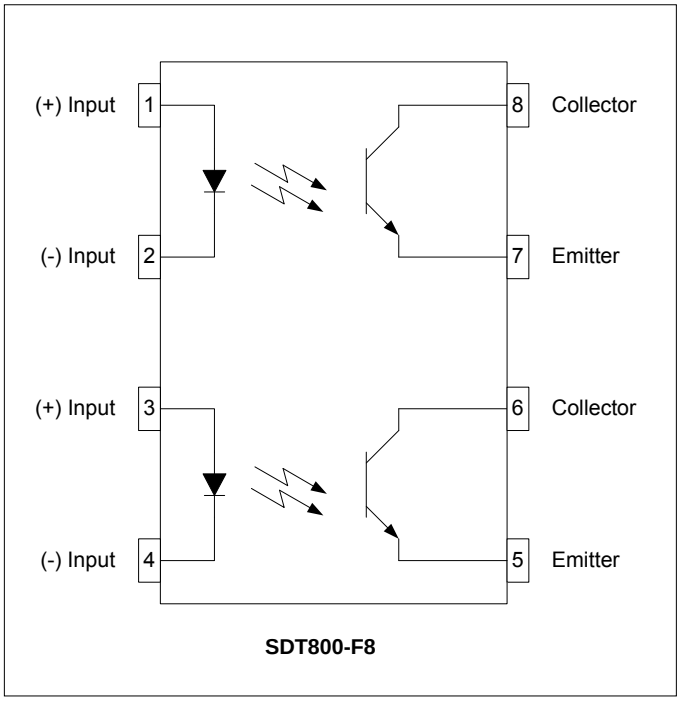
The SDT800-F8 consists of two phototransistors optically coupled to two light emitting diodes. Optical coupling between the input IR LEDs and output phototransistors allows for high isolation levels while maintaining low-level DC signal control capability. The SDT800-F8 provides an optically isolated method of controlling many interface applications such as telecommunications, industrial control and instrumentation circuitry.

The SDT800-F8 comes standard in a miniature 8 pin SSOP package.

Applications

- Registers, Copiers, Automatic Vending Machines
- System Appliances, Measuring Instruments
- Feedback Control Circuits
- Telecommunication Equipment, Telephones
- Home Appliances
- Digital Logic Inputs
- Microprocessor Inputs
- Switching Power Supplies

Schematic Diagram



SDT800-F8

Features

- V_{CEO} = 80V
- Small 8 pin SSOP package (0.050" lead pitch)
- Low input power consumption
- High stability
- CTR Range 20 – 320% (Binning Optional)
- High Isolation Voltage (3,750V_{RMS})
- Long Life / High Reliability
- RoHS / Pb-Free / REACH Compliant

Agency Approvals

UL / C-UL:	File # E201932
VDE:	File # 40035191 (EN 60747-5-2)

Absolute Maximum Ratings

The values indicated are absolute stress ratings. Functional operation of the device is not implied at these or any conditions in excess of those defined in electrical characteristics section of this document. Exposure to absolute Maximum Ratings may cause permanent damage to the device and may adversely affect reliability.

Storage Temperature	-55 to +150°C
Operating Temperature	-55 to +110°C
Continuous Input Current	30mA
Reverse Input Control Voltage	5V
Input Power Dissipation	50mW
Output Power Dissipation	125mW
Total Power Dissipation	300mW
Solder Temperature – Wave (10sec)	260°C
Solder Temperature – IR Reflow (10sec)	260°C

Ordering Information

Part Number	Description
SDT800-F8	8 pin SSOP, Tape and Reel (2000/Reel)

NOTE: Suffixes listed above are not included in marking on device for part number identification

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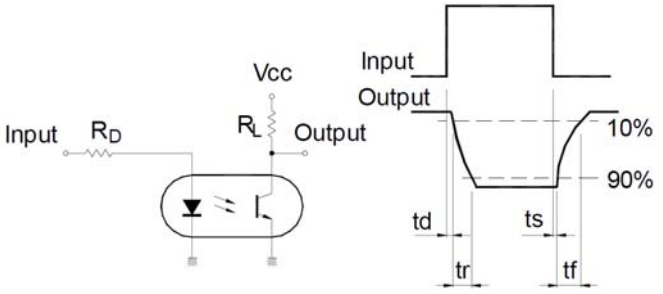
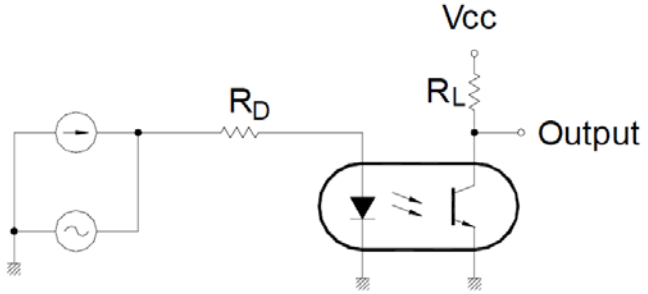
Electrical Characteristics, T_A = 25°C (unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Units	Test Conditions
Input Specifications						
LED Forward Voltage	V_F	-	1.2	1.55	V	I_F = 10mA
LED Reverse Voltage	BV_R	5	-	-	V	I_R = 10µA
Terminal Capacitance	C_t	-	25	-	pF	V=0, f=1KHz
Input Reverse Current	I_R	-	0.1	100	µA	V_R=6V
Output Specifications						
Collector-Emitter Voltage	V_{CEO}	80	-	-	V	I_C=10µA
Emitter-Collector Voltage	V_{COE}	7	-	-	V	I_E=10µA
Collector Dark Current	I_{CEO}	-	5	50	nA	V_{CE}=10V
Collector Emitter Capacitance	C_{CE}	-	10	-	pF	V_{CE}=0, f=1MHz
Saturation Voltage	$V_{CE(sat)}$	-	0.2	0.4	V	I_F=10mA, I_C=2.5mA
Coupled Specifications						
Rise Time	T_R	-	5.0	-	µS	I_C=2mA, V_{CC}=2V, R_L=100Ω
Fall Time	T_F	-	4.0	-	µS	I_C=2mA, V_{CC}=2V, R_L=100Ω
Current Transfer Ratio						
- A	CTR	40	-	80	%	I_F=10mA, V_{CE}=5V
		13	-	-	%	I_F=1mA, V_{CE}=5V
- B	CTR	63	-	125	%	I_F=10mA, V_{CE}=5V
		22	-	-	%	I_F=1mA, V_{CE}=5V
- C	CTR	100	-	200	%	I_F=10mA, V_{CE}=5V
		34	-	-	%	I_F=1mA, V_{CE}=5V
- D	CTR	160	-	320	%	I_F=10mA, V_{CE}=5V
		48	-	-	%	I_F=1mA, V_{CE}=5V
- E	CTR	20	-	-	%	I_F=10mA, V_{CE}=5V
Isolation Specifications						
Isolation Voltage	V_{ISO}	3750	-	-	V_{RMS}	RH ≤ 50%, t=1min
Input-Output Resistance	R_{I-O}	-	10^{12}	-	Ω	V_{I-O} = 500V_{DC}

Test Circuit: *Response Time*



Test Circuit: *Frequency Response*



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SDT800-F8 Performance & Characteristics Plots, T_A = 25°C (unless otherwise specified)

Figure 1: *Forward Current (I_F) vs. Forward Voltage (V_F)*

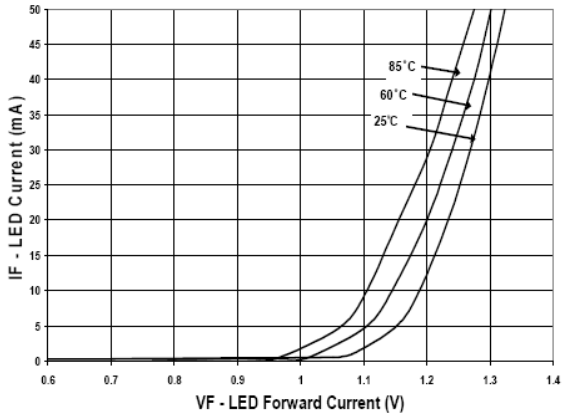


Figure 2: *Package Power Dissipation (P_T) vs. Temperature (°C)*

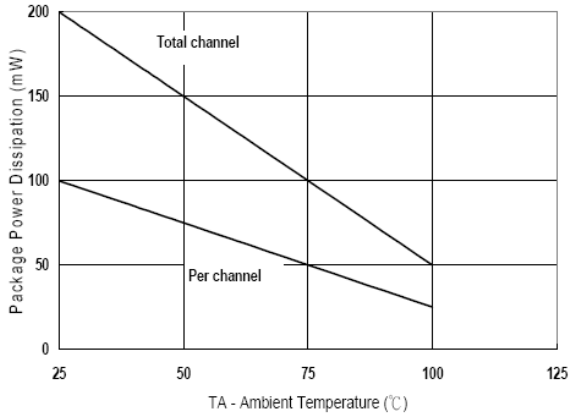


Figure 3: *Switching Speed (T_R) vs. Load Resistor (R_L)*

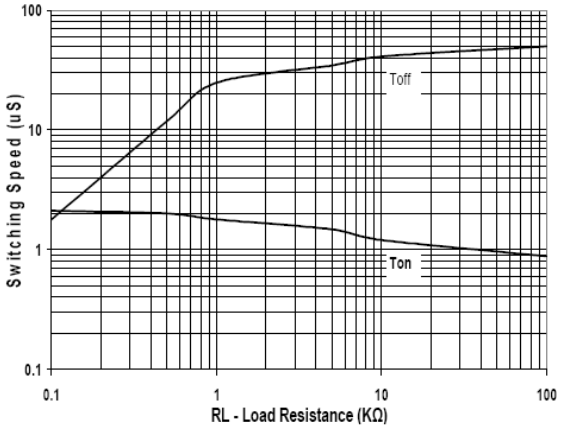


Figure 4: *Current Transfer Ratio (CTR) vs. Temperature (°C)*

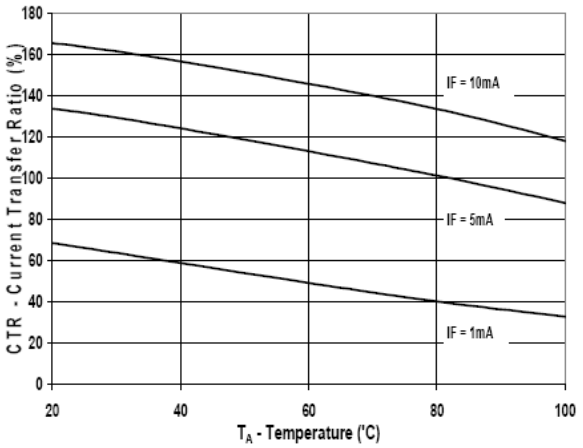


Figure 5: *Collector-Emitter Voltage (V_{CE}) vs. Collector Current (I_C)*

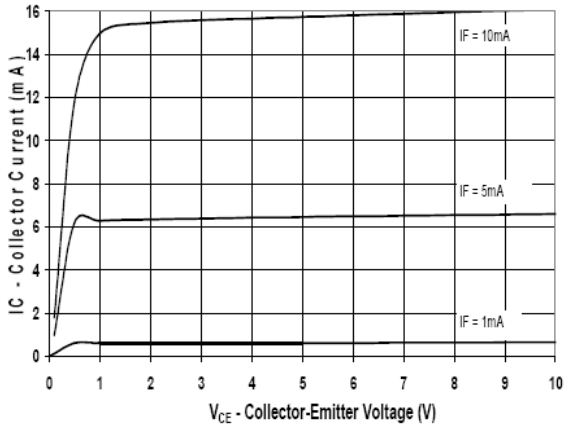
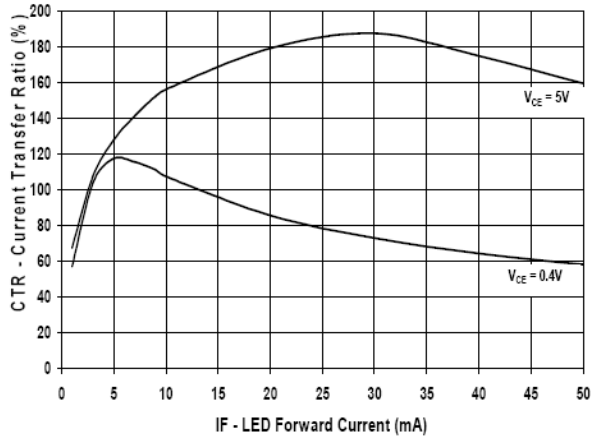


Figure 6: *Current Transfer Ratio (CTR) vs. Forward Current (I_F)*



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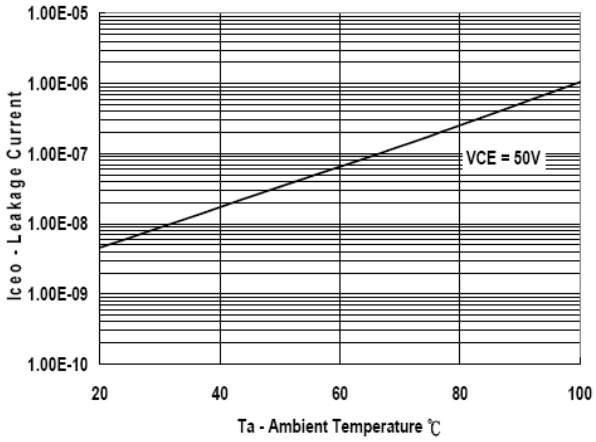
SDT800-F8 Performance & Characteristics Plots, T_A = 25°C (unless otherwise specified)

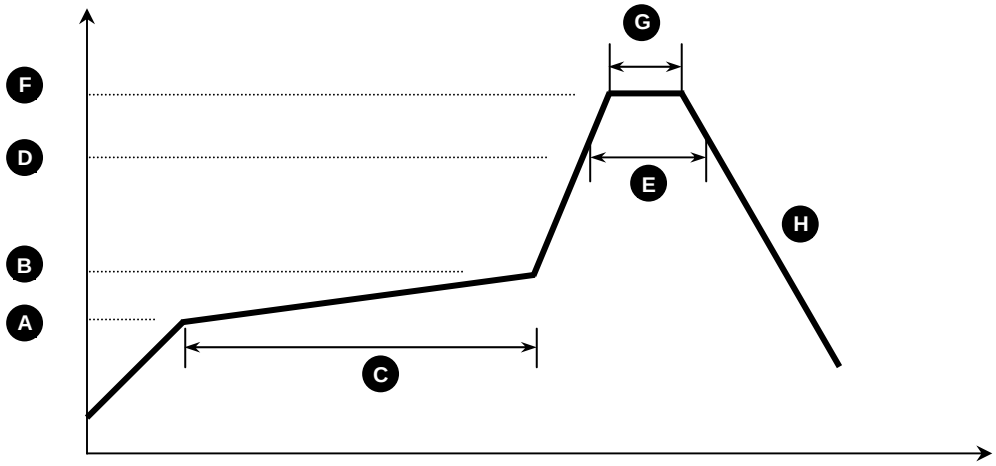
Figure 7: *Collector Dark Current (I_{CEO}) vs. Temperature (°C)*



SDT800-F8 Solder Reflow Temperature Profile Recommendations

(1) *Infrared Reflow:*

Refer to the following figure as an example of an optimal temperature profile for single occurrence infrared reflow. Soldering process should not exceed temperature or time limits expressed herein. Surface temperature of device package should not exceed 250ºC:



Process Step	Description	Parameter
A	Preheat Start Temperature (ºC)	150ºC
B	Preheat Finish Temperature (ºC)	180ºC
C	Preheat Time (s)	90 - 120s
D	Melting Temperature (ºC)	230ºC
E	Time above Melting Temperature (s)	30s
F	Peak Temperature, at Terminal (ºC)	260ºC
G	Dwell Time at Peak Temperature (s)	10s
H	Cool-down (ºC/s)	<6ºC/s

(2) *Wave Solder:*

Maximum Temperature:	260ºC (at terminal)
Maximum Time:	10s
Pre-heating:	100 - 150ºC (30 - 90s)
Single Occurrence	

(3) *Hand Solder:*

Maximum Temperature:	350ºC (at tip of soldering iron)
Maximum Time:	3s
Single Occurrence	

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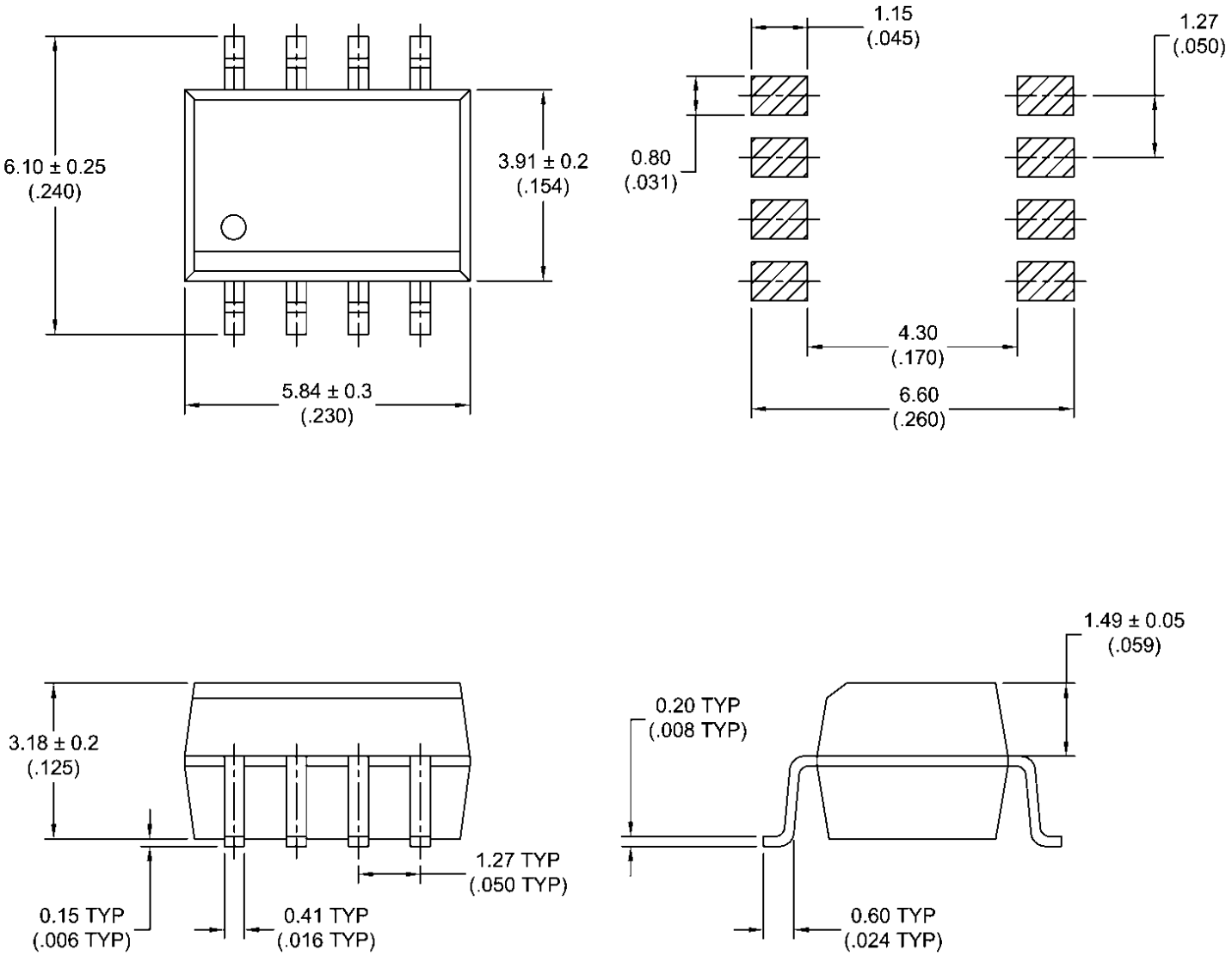
SDT800-F8 Package Dimensions

8 PIN SSOP Package

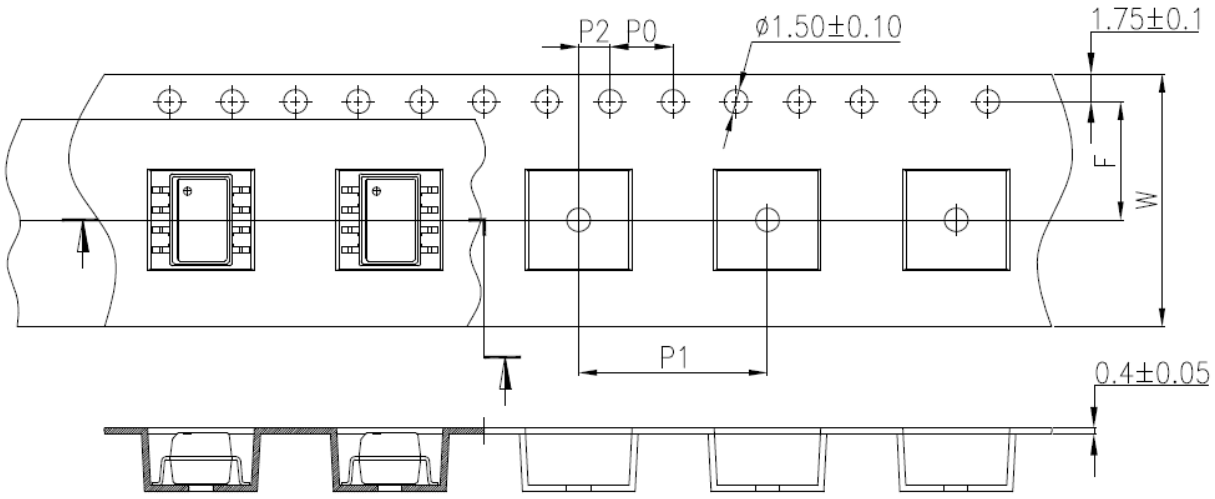
Note: *All dimensions in millimeters [mm] with inches in parenthesis ()*



SDT800-F8 Packaging Specifications

Tape & Reel Specifications (T&R)

Note: *All dimensions in millimeters [mm] with inches in parenthesis ()*



Specification	Symbol	Dimensions, mm (inches)
Tape Width	W	16 ± 0.3 (0.63)
Sprocket Hole Pitch	P0	4 ± 0.1 (0.15)
Compartment Location	F P2	7.5 ± 0.1 (0.295) 2 ± 0.1 (0.079)
Compartment Pitch	P1	12 ± 0.1 (0.472)

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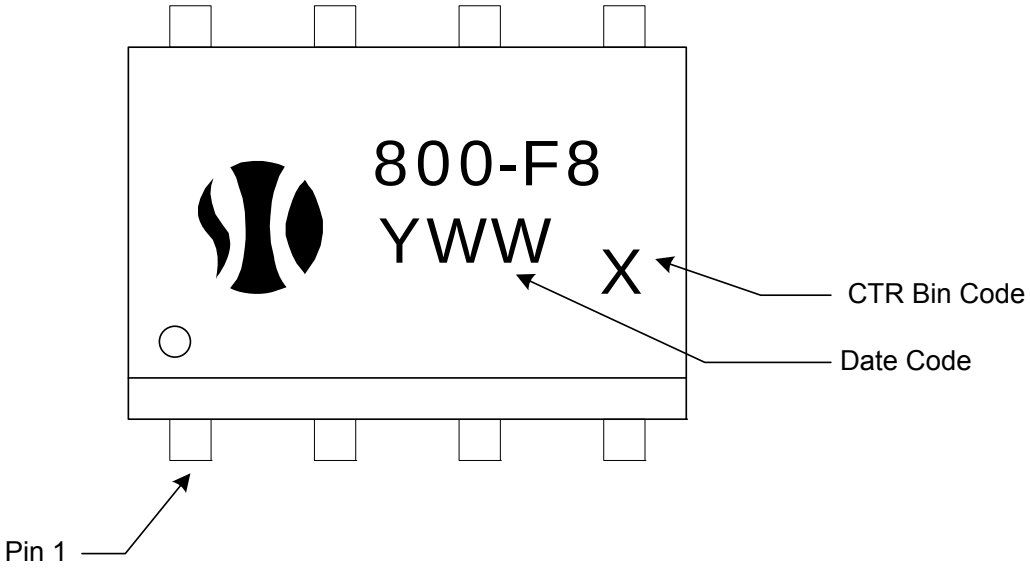
SDT800-F8 Package Marking



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