



# CAT25010, CAT25020, CAT25040

1K/2K/4K SPI Serial CMOS EEPROM

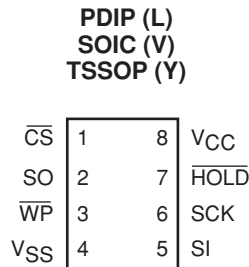
## FEATURES

- 10 MHz SPI compatible
- 1.8 to 5.5 volt operation
- 16-byte page write buffer
- Hardware and software protection
- Block write protection
  - Protect 1/4, 1/2 or all of EEPROM array
- Low power CMOS technology
- SPI modes (0,0 & 1,1)
- Industrial temperature range
- 1,000,000 program/erase cycles
- 100 year data retention
- Self-timed write cycle
- RoHS compliant “Green” & “Gold”  
8-pin PDIP, SOIC and TSSOP packages

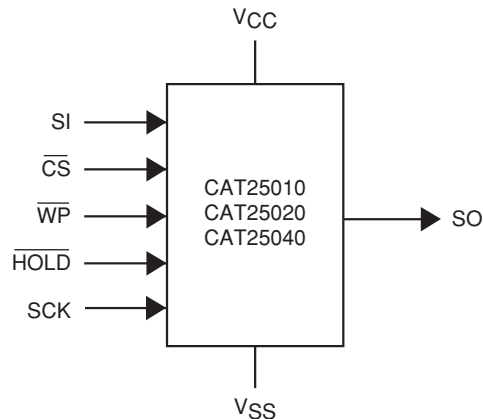
## DESCRIPTION

The CAT25010/20/40 is a 1K/2K/4K Bit SPI Serial CMOS EEPROM internally organized as 128x8/256x8/512x8 bits. Catalyst’s advanced CMOS Technology substantially reduces device power requirements. The CAT25010/20/40 features a 16-byte page write buffer. The device operates via the SPI bus serial interface and is enabled through a Chip Select ( $\overline{CS}$ ). In addition to the Chip Select, the clock input (SCK), data in (SI) and data out (SO) are required to access the device. The  $\overline{HOLD}$  pin may be used to suspend any serial communication without resetting the serial sequence. The CAT25010/20/40 is designed with software and hardware write protection features including Block Write protection. The device is available in 8-pin DIP, 8-pin SOIC and 8-pin TSSOP packages.

## PIN CONFIGURATION



## FUNCTIONAL SYMBOL



## PIN FUNCTIONS

Pin Name	Function
SO	Serial Data Output
SCK	Serial Clock
$\overline{WP}$	Write Protect
VCC	+1.8V to +5.5V Power Supply
VSS	Ground
$\overline{CS}$	Chip Select
SI	Serial Data Input
$\overline{HOLD}$	Suspends Serial Input

**ABSOLUTE MAXIMUM RATINGS\***

Storage Temperature	-65°C to +150°C
Voltage on Any Pin with Respect to Ground <sup>(1)</sup>	-0.5 V to +6.5 V

\* Stresses above 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 outside of those listed in the operational sections of this specification is not implied. Exposure to any absolute maximum rating for extended periods may affect device performance and reliability.

**RELIABILITY CHARACTERISTICS<sup>(2)</sup>**

Symbol	Parameter	Min	Units
N <sub>END</sub> (*)	Endurance	1,000,000	Program/ Erase Cycles
T <sub>DR</sub>	Data Retention	100	Years

(\*) Page Mode, V<sub>CC</sub> = 5 V, 25°C

**D.C. OPERATING CHARACTERISTICS**

V<sub>CC</sub> = 1.8 V to 5.5 V, T<sub>A</sub> = -40°C to 85°C, unless otherwise specified.

Symbol	Parameter	Test Conditions	Min	Max	Units
I <sub>CC</sub>	Supply Current	Read, Write, V <sub>CC</sub> = 5.0V, f <sub>SCK</sub> = 10MHz, SO open		2	mA
I <sub>SB1</sub>	Standby Current	V <sub>IN</sub> = GND or V <sub>CC</sub> , $\overline{CS}$ = V <sub>CC</sub> , $\overline{WP}$ = V <sub>CC</sub> , V <sub>CC</sub> = 5V		2	μA
I <sub>SB2</sub>	Standby Current	V <sub>IN</sub> = GND or V <sub>CC</sub> , $\overline{CS}$ = V <sub>CC</sub> , $\overline{WP}$ = GND, V <sub>CC</sub> = 5V		4	μA
I <sub>L</sub>	Input Leakage Current	V <sub>IN</sub> = GND or V <sub>CC</sub>	-2	2	μA
I <sub>LO</sub>	Output Leakage Current	$\overline{CS}$ = V <sub>CC</sub> , V <sub>OUT</sub> = GND or V <sub>CC</sub>	-1	1	μA
V <sub>IL</sub> <sup>(3)</sup>	Input Low Voltage		-0.5	0.3V <sub>CC</sub>	V
V <sub>IH</sub> <sup>(3)</sup>	Input High Voltage		0.7V <sub>CC</sub>	V <sub>CC</sub> + 0.5	V
V <sub>OL1</sub>	Output Low Voltage	V <sub>CC</sub> > 2.5V, I <sub>OL</sub> = 3.0mA		0.4	V
V <sub>OH1</sub>	Output High Voltage	V <sub>CC</sub> > 2.5V, I <sub>OH</sub> = -1.6mA	V <sub>CC</sub> - 0.8V		V
V <sub>OL2</sub>	Output Low Voltage	V <sub>CC</sub> > 1.8V, I <sub>OL</sub> = 150μA		0.2	V
V <sub>OH2</sub>	Output High Voltage	V <sub>CC</sub> > 1.8V, I <sub>OH</sub> = -100μA	V <sub>CC</sub> - 0.2V		V

**PIN CAPACITANCE<sup>(2)</sup>**

T<sub>A</sub> = 25°C, f = 1 MHz, V<sub>CC</sub> = 5V

Symbol	Test Conditions	Max	Conditions	Units
C <sub>OUT</sub>	Output Capacitance (SO)	8	V <sub>OUT</sub> = 0 V	pF
C <sub>IN</sub>	Input Capacitance ( $\overline{CS}$ , SCK, SI, $\overline{WP}$ , HOLD)	6	V <sub>IN</sub> = 0 V	pF

Note:

- (1) The DC input voltage on any pin should not be lower than -0.5V or higher than V<sub>CC</sub> + 0.5V. During transitions, the voltage on any pin may undershoot to no less than -1.5 V or overshoot to no more than V<sub>CC</sub> + 1.5V, for periods of less than 20ns.
- (2) These parameters are tested initially and after a design or process change that affects the parameter according to appropriate AEC-Q100 and JEDEC test methods.
- (3) V<sub>IL</sub> and V<sub>IH</sub> are reference values and are not tested.

**A.C. CHARACTERISTICS**

SYMBOL	PARAMETER	CAT250XX-1.8		CAT250XX		Test Conditions	UNITS
		1.8V-5.5V		2.5V-5.5V			
		Min.	Max.	Min.	Max.		
t <sub>SU</sub>	Data Setup Time	30		20		C <sub>L</sub> = 50pF (note 2)	ns
t <sub>H</sub>	Data Hold Time	30		20			ns
t <sub>WH</sub>	SCK High Time	75		40			ns
t <sub>WL</sub>	SCK Low Time	75		40			ns
f <sub>SCK</sub>	Clock Frequency	DC	5	DC	10		MHz
t <sub>LZ</sub>	$\overline{\text{HOLD}}$ to Output Low Z		50		50		ns
t <sub>RI</sub> <sup>(1)</sup>	Input Rise Time		2		2		μs
t <sub>FI</sub> <sup>(1)</sup>	Input Fall Time		2		2		μs
t <sub>HD</sub>	$\overline{\text{HOLD}}$ Setup Time	0		0			ns
t <sub>CD</sub>	$\overline{\text{HOLD}}$ Hold Time	10		10			ns
t <sub>WC</sub> <sup>(4)</sup>	Write Cycle Time		5		5		ms
t <sub>V</sub>	Output Valid from Clock Low		75		40		ns
t <sub>HO</sub>	Output Hold Time	0		0			ns
t <sub>DIS</sub>	Output Disable Time		50		20		ns
t <sub>HZ</sub>	$\overline{\text{HOLD}}$ to Output High Z		100		25		ns
t <sub>CS</sub>	$\overline{\text{CS}}$ High Time	50		15			ns
t <sub>CSS</sub>	$\overline{\text{CS}}$ Setup Time	50		15			ns
t <sub>CSH</sub>	$\overline{\text{CS}}$ Hold Time	50		15			ns
t <sub>WPS</sub>	$\overline{\text{WP}}$ Setup Time	10		10			ns
t <sub>WPH</sub>	$\overline{\text{WP}}$ Hold Time	10		10		ns	

**Power-Up Timing<sup>(1)(3)</sup>**

Symbol	Parameter	Max.	Units
t <sub>PUR</sub>	Power-up to Read Operation	1	ms
t <sub>PUW</sub>	Power-up to Write Operation	1	ms

**NOTE:**

- (1) This parameter is tested initially and after a design or process change that affects the parameter.
- (2) AC Test Conditions:  
 Input Pulse Voltages: 0.3V<sub>CC</sub> to 0.7V<sub>CC</sub>  
 Input rise and fall times: ≤10ns  
 Input and output reference voltages: 0.5V<sub>CC</sub>  
 Output load: current source IOL max/IOH max; C<sub>L</sub>=50pF
- (3) t<sub>PUR</sub> and t<sub>PUW</sub> are the delays required from the time V<sub>CC</sub> is stable until the specified operation can be initiated.
- (4) t<sub>WC</sub> is the time from the rising edge of  $\overline{\text{CS}}$  after a valid write sequence to the end of the internal write cycle.

## FUNCTIONAL DESCRIPTION

The CAT25010/20/40 supports the SPI bus data transmission protocol. The synchronous Serial Peripheral Interface (SPI) helps the CAT25010/20/40 to interface directly with many of today's popular microcontrollers. The CAT25010/20/40 contains an 8-bit instruction register. (The instruction set and the operation codes are detailed in the instruction set table)

After the device is selected with  $\overline{CS}$  going low, the first byte will be received. The part is accessed via the SI pin, with data being clocked in on the rising edge of SCK. The first byte contains one of the six op-codes that define the operation to be performed.

## PIN DESCRIPTION

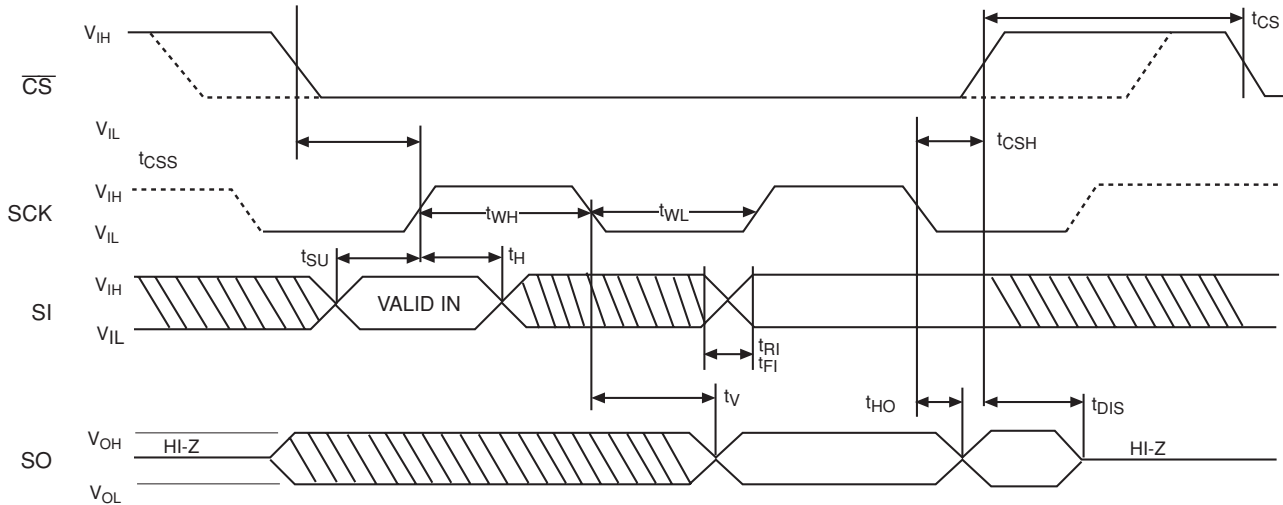
### SI: Serial Input

SI is the serial data input pin. This pin is used to input all opcodes, byte addresses, and data to be written to the CAT25010/20/40. Input data is latched on the rising edge of the serial clock for SPI modes (0, 0 & 1, 1).

### SO: Serial Output

SO is the serial data output pin. This pin is used to transfer data out of the CAT25010/20/40. During a read cycle, data is shifted out on the falling edge of the serial clock for SPI modes (0,0 & 1,1).

**Figure 1. Synchronous Data Timing**



Note: Dashed Line= mode (1, 1) - - - - -

## INSTRUCTION SET

Instruction	Opcode	Operation
WREN	0000 0110	Enable Write Operations
WRDI	0000 0100	Disable Write Operations
RDSR	0000 0101	Read Status Register
WRSR	0000 0001	Write Status Register
READ	0000 X011 <sup>(1)</sup>	Read Data from Memory
WRITE	0000 X010 <sup>(1)</sup>	Write Data to Memory

Note:

(1) X=0 for CAT25010, CAT25020. X=A8 for CAT25040

**SCK:** Serial Clock

SCK is the serial clock pin. This pin is used to synchronize the communication between the microcontroller and the CAT25010/20/40. Opcodes, byte addresses, or data present on the SI pin are latched on the rising edge of the SCK. Data on the SO pin is updated on the falling edge of the SCK for SPI modes (0,0 & 1,1) .

**$\overline{CS}$ :** Chip Select

$\overline{CS}$  is the Chip select pin.  $\overline{CS}$  low enables the CAT25010/20/40 and  $\overline{CS}$  high disables the CAT25010/20/40.  $\overline{CS}$  high takes the SO output pin to high impedance and forces the devices into a Standby Mode (unless an internal write operation is underway). A high to low transition on  $\overline{CS}$  is required prior to any sequence being initiated. A low to high transition on  $\overline{CS}$  after a valid write sequence is what initiates an internal write cycle.

**$\overline{WP}$ :** Write Protect

$\overline{WP}$  is the Write Protect pin. The Write Protect pin will allow normal read/write operations when held high. When  $\overline{WP}$  is tied low all write operations are inhibited.  $\overline{WP}$  held low while  $\overline{CS}$  is low will interrupt a write to the CAT25010/20/40. If the internal write cycle has already been initiated,  $\overline{WP}$  going low will have no effect on any write operation. Figure 10 illustrates the  $\overline{WP}$  timing sequence during a write operation.

**$\overline{HOLD}$ :** Hold

The  $\overline{HOLD}$  pin is used to pause transmission to the CAT25010/20/40 while in the middle of a serial sequence without having to re-transmit entire sequence at a later time. To pause,  $\overline{HOLD}$  must be brought low while SCK is low. The SO pin is in a high impedance state during the time the part is paused, and transitions on the SI pins will be ignored. To resume communication,  $\overline{HOLD}$  is brought high, while SCK is low. ( $\overline{HOLD}$  should be held high any time this function is not being used.)  $\overline{HOLD}$  may be tied high directly to  $V_{CC}$  or tied to  $V_{CC}$  through a resistor. Figure 9 illustrates hold timing sequence.

**STATUS REGISTER**

7	6	5	4	3	2	1	0
1	1	1	1	BP1	BP0	WEL	$\overline{RDY}$

**BLOCK PROTECTION BITS**

Status Register Bits		Array Address Protected	Protection
BP1	BP0		
0	0	None	No Protection
0	1	CAT25010: 60-7F CAT25020: C0-FF CAT25040: 180-1FF	Quarter Array Protection
1	0	CAT25010: 40-7F CAT25020: 80-FF CAT25040: 100-1FF	Half Array Protection
1	1	CAT25010: 00-7F CAT25020: 00-FF CAT25040: 000-1FF	Full Array Protection

## STATUS REGISTER

The Status Register indicates the status of the device. The RDY (Ready) bit indicates whether the CAT25010/20/40 is busy with a write operation. When set to 1 a write cycle is in progress and when set to 0 the device indicates it is ready. This bit is read only.

The WEL (Write Enable) bit indicates the status of the write enable latch. When set to 1, the device is in a Write Enable state and when set to 0 the device is in a Write Disable state. The WEL bit can only be set by the WREN instruction and can be reset by the WRDI instruction.

The BP0 and BP1 (Block Protect) bits indicate which blocks are currently protected. These bits are set by the user issuing the WRSR instruction. The user is allowed to protect quarter of the memory, half of the memory or the entire memory by setting these bits. Once protected, the user may only read from the protected portion of the array. These bits are non-volatile.

## DEVICE OPERATION

### Write Enable and Disable

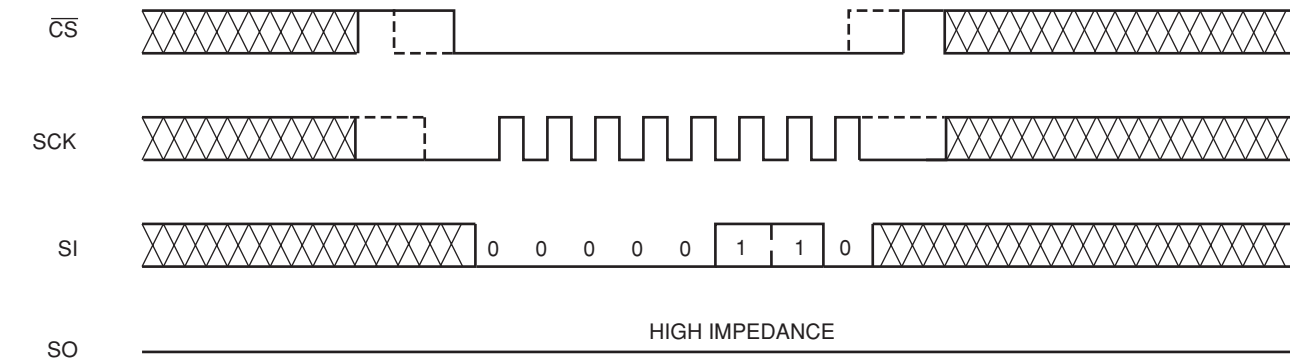
The CAT25010/20/40 contains a write enable latch. This latch must be set before any write operation. The device powers up in a write disable state when  $V_{CC}$  is applied. WREN instruction will enable writes (set the latch) to the device. If  $\overline{WP}$  pin is held low, the write enable latch is reset to the write disable state, regardless of the WREN Instruction. WRDI instruction will disable writes (reset the latch) to the device. Disabling writes will protect the device against inadvertent writes.

### READ Sequence

The part is selected by pulling  $\overline{CS}$  low. The 8-bit read instruction is transmitted to the CAT25010/20/40, followed by the 8-bit address for CAT25010/20/40 (for the 25040, bit 3 of the read data instruction contains address A8).

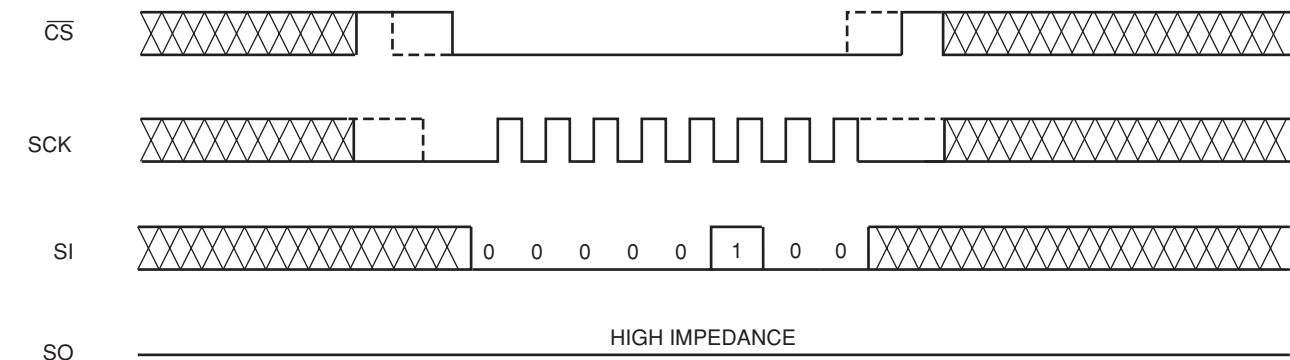
After the correct read instruction and address are sent, the data stored in the memory at the selected address is shifted out on the SO pin. The data stored in the memory at the next address can be read sequentially by continuing

Figure 2. WREN Instruction Timing



Note: Dashed Line = mode (1, 1) -----

Figure 3. WRDI Instruction Timing



Note: Dashed Line = mode (1, 1) -----

to provide clock pulses. The internal address pointer is automatically incremented to the next higher address after each byte of data is shifted out. When the highest address is reached, the address counter rolls over to 0000h allowing the read cycle to be continued indefinitely. The read operation is terminated by pulling the CS high. Read sequence is illustrated in Figure 4.

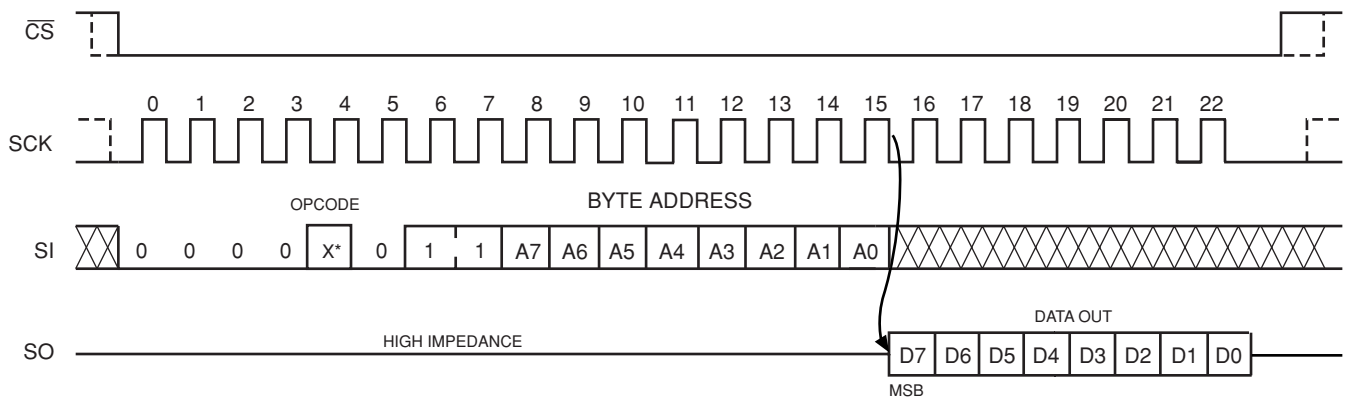
To read the status register, RDSR instruction should be sent. The contents of the status register are shifted out on the SO line. The status register may be read at any time even during a write cycle. Reading status register

is illustrated in Figure 5.

**WRITE Sequence**

The CAT25010/20/40 powers up in a Write Disable state. Prior to any write instructions, the WREN instruction must be sent to CAT25010/20/40. The device goes into Write enable state by pulling the CS low and then clocking the WREN instruction into CAT25010/20/40. The CS must be brought high after the WREN instruction to enable writes to the device. If the write operation is initiated immediately after the WREN instruction without CS being brought high, the data will not be written to the

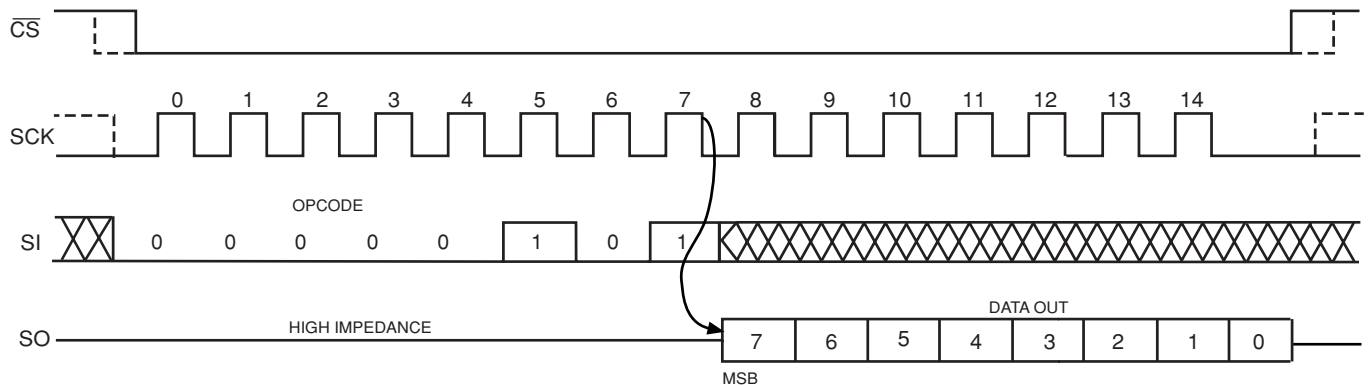
**Figure 4. Read Instruction Timing**



\*Please check the instruction set table for address  
X=0 for 25010, 25020 ; X=A8 for 25040

Note: Dashed line = mode (1,1)----

**Figure 5. RDSR Instruction Timing**



Note: Dashed Line= mode (1, 1) -----

array because the write enable latch will not have been properly set. Also, for a successful write operation the address of the memory location(s) to be programmed must be outside the protected address field location selected by the block protection level.

**Byte Write**

Once the device is in a Write Enable state, the user may proceed with a write sequence by setting the  $\overline{CS}$  low, issuing a write instruction via the SI line, followed by the 8-bit address for 25010/20/40 (for the 25040, bit 3 of the read data instruction contains address A8). Programming will start after the  $\overline{CS}$  is brought high. Figure 6 illustrates byte write sequence.

During an internal write cycle, all commands will be ignored except the RDSR (Read Status Register) instruction.

The Status Register can be read to determine if the write cycle is still in progress. If Bit 0 of the Status Register is set at 1, write cycle is in progress. If Bit 0 is set at 0, the

device is ready for the next instruction

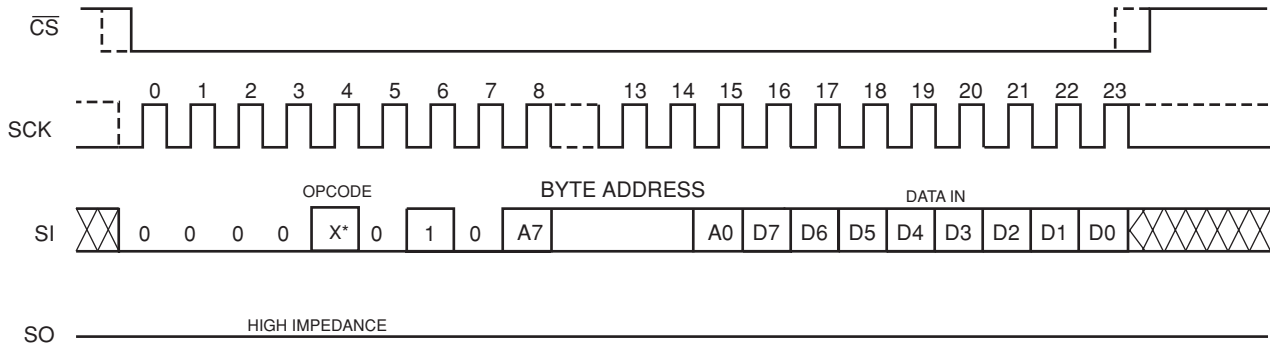
**Page Write**

The CAT25010/20/40 features page write capability. After the initial byte, the host may continue to write up to 16 bytes of data to the CAT25010/20/40. After each byte of data received, lower order address bits are internally incremented by one; the high order bits of address will remain constant. The only restriction is that the X (X=16 for CAT25010/20/40) bytes must reside on the same page. If the address counter reaches the end of the page and clock continues, the counter will “roll over” to the first address of the page and overwrite any data that may have been written. The CAT25010/20/40 is automatically returned to the write disable state at the completion of the write cycle. Figure 8 illustrates the page write sequence.

**Status Register Write**

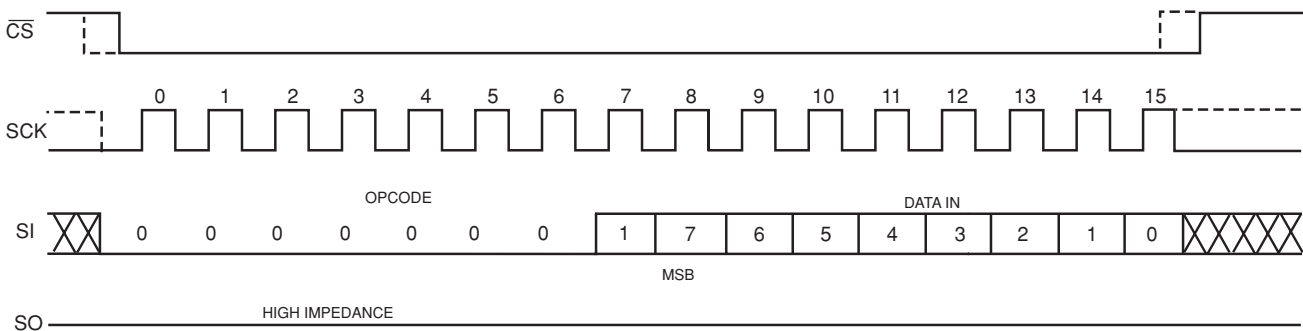
To write to the status register, the WRSR instruction should be sent. Only Bit 2 and Bit 3 of the status register can be written using the WRSR instruction. Figure 7 illustrates the sequence of writing to status register.

**Figure 6. Write Instruction Timing**



Note: Dashed Line= mode (1, 1) -----  
 \*X=0 for 25010, 25020 ; X=A8 for 25040

**Figure 7. WRSR Timing**



Note: Dashed Line= mode (1, 1) -----

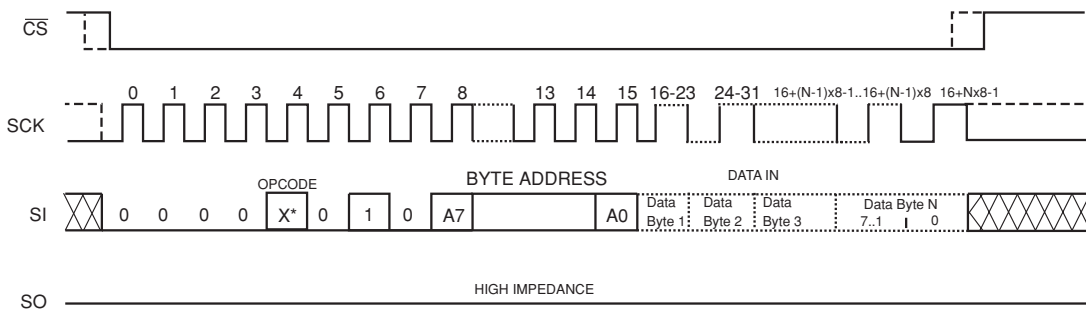


**DESIGN CONSIDERATIONS**

The CAT25010/20/40 powers up in a write disable state and in a low power standby mode. A WREN instruction must be issued to perform any writes to the device after power up. After power up,  $\overline{CS}$  must be brought low to enter a ready state and receive an instruction. After a successful byte/page write or status register write, the CAT25010/20/40 goes into a write disable mode.  $\overline{CS}$  must be set high after the proper

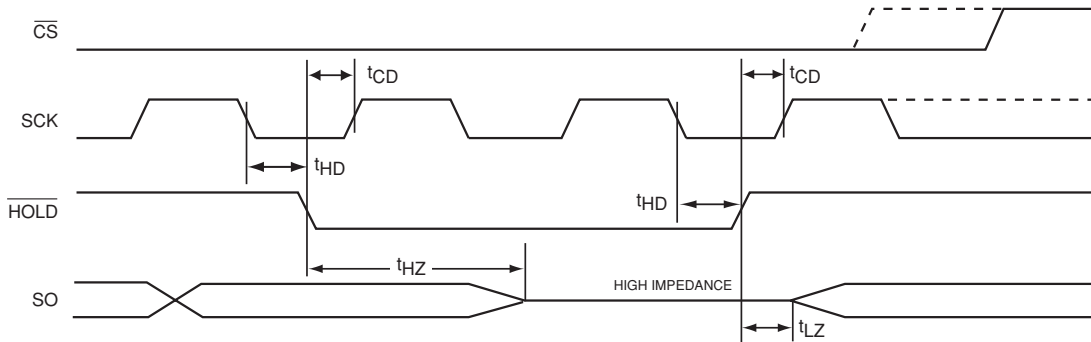
number of clock cycles to start an internal write cycle. Access to the array during an internal write cycle is ignored and programming is continued. On power up, SO is in a high impedance. If an invalid opcode is received, no data will be shifted into the CAT25010/20/40, and the serial output pin (SO) will remain in a high impedance state until the falling edge of  $\overline{CS}$  is detected again.

**Figure 8. Page Write Instruction Timing**



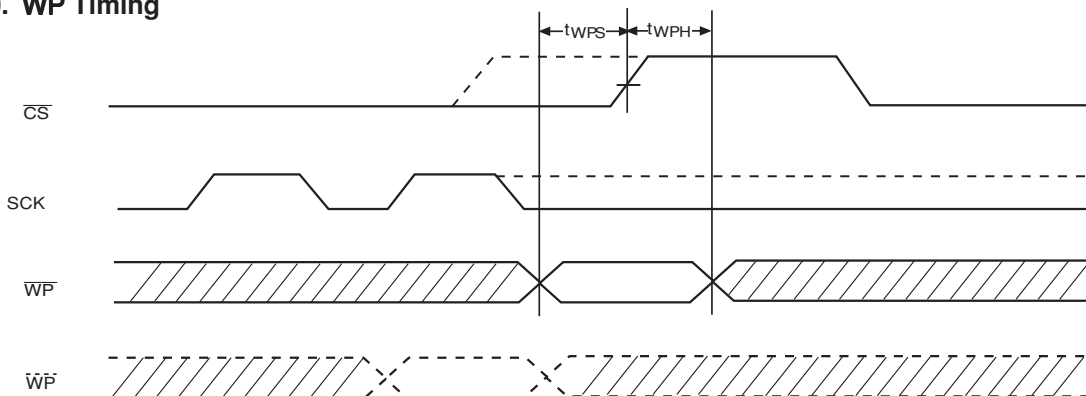
Note: Dashed Line= mode (1, 1) ----- \*X=0 for 25010, 25020 ; X=A8 for 25040

**Figure 9. HOLD Timing**



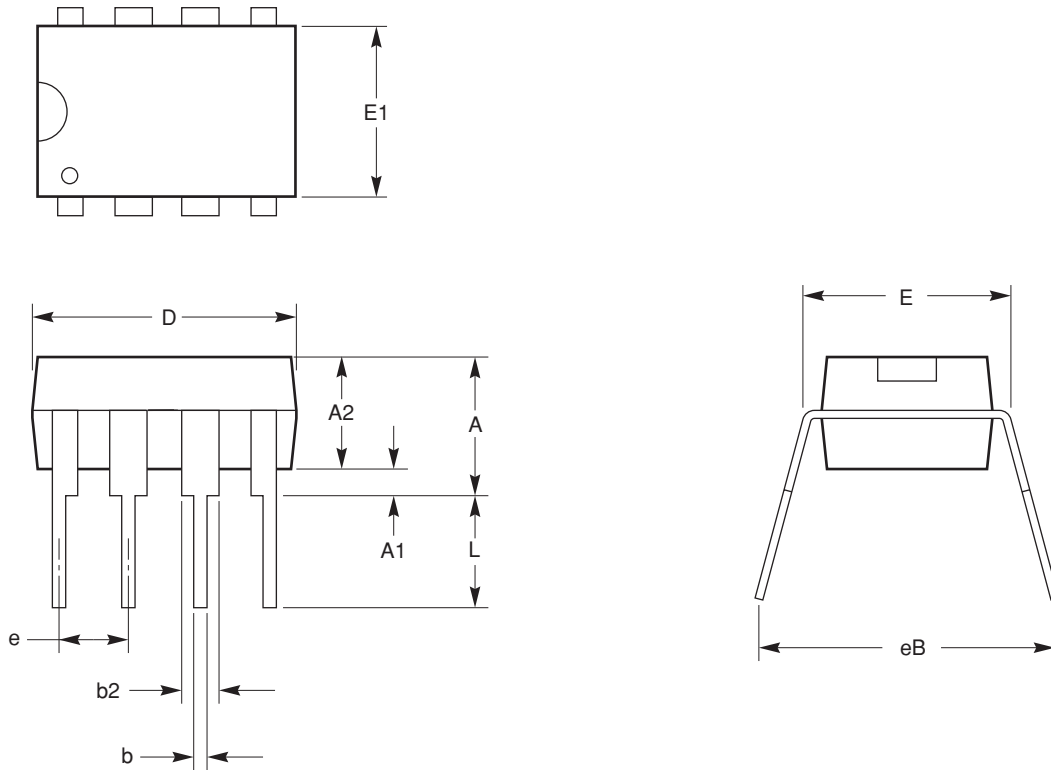
Note: Dashed Line= mode (1, 1) -----

**Figure 10.  $\overline{WP}$  Timing**



Note: Dashed Line= mode (1, 1) -----

**8-LEAD 300 MIL WIDE PLASTIC DIP (L)**

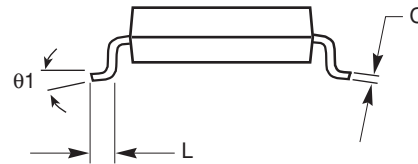
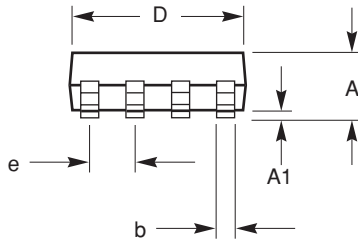
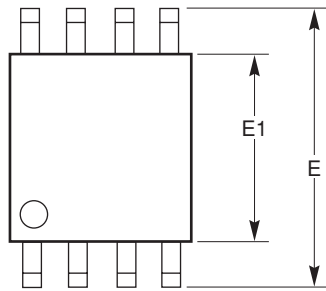


SYMBOL	MIN	NOM	MAX
A	0.120		0.210
A1	0.015		
A2	0.115	0.130	0.195
b	0.014	0.018	0.022
b2	0.045	0.060	0.070
D	0.355	0.365	0.400
D2	0.300		0.325
E	0.300	0.310	0.325
E1	0.240	0.250	0.280
e		0.100 BSC	
eB			0.430
L	0.115	0.130	0.150

Notes:

1. Complies with JEDEC Standard MS001.
2. All dimensions are in inches.
3. Dimensioning and tolerancing per ANSI Y14.5M-1982

### 8-LEAD 150 MIL WIDE SOIC (V)

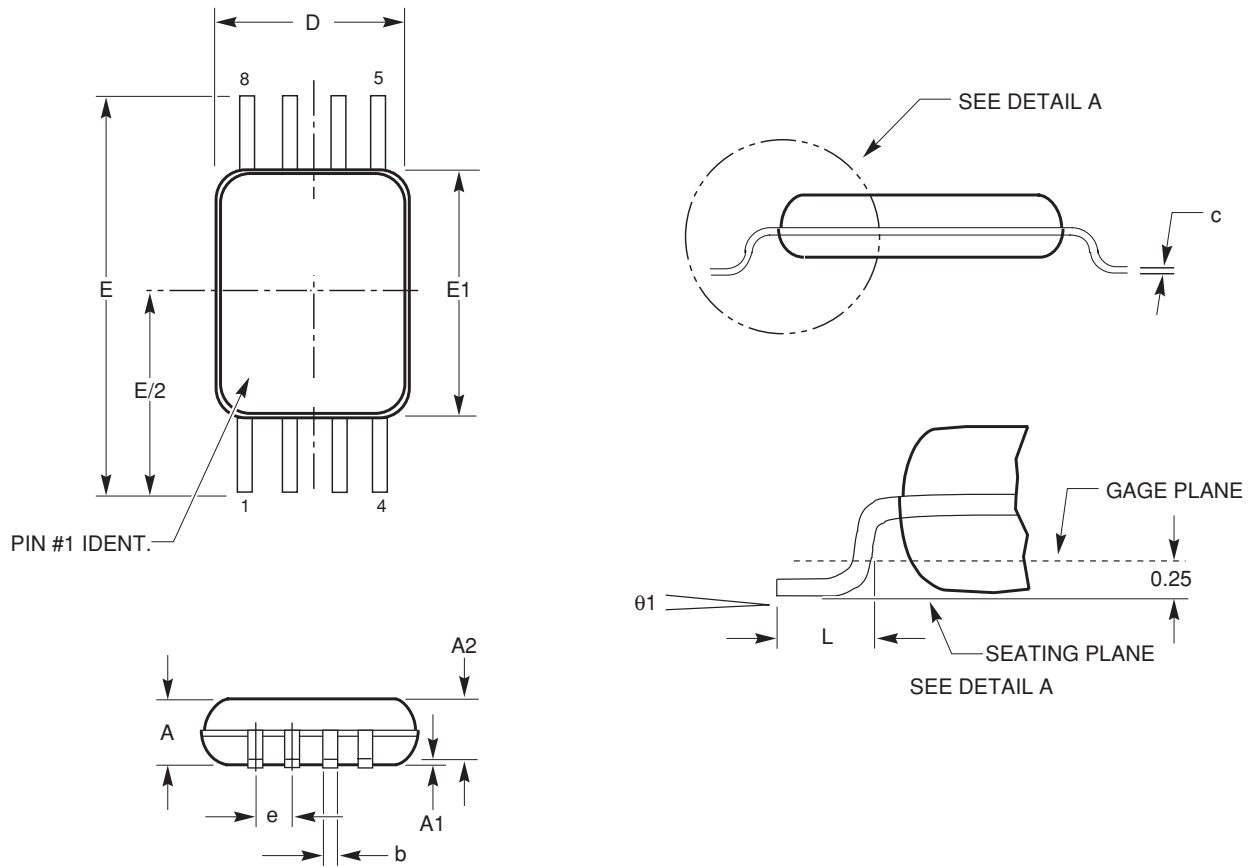


SYMBOL	MIN	NOM	MAX
A1	0.0040		0.0098
A2	0.0532		0.0688
b	0.013		0.020
C	0.0075		0.0098
D	0.1890		0.1968
E	0.2284		0.2440
E1	0.149		0.1574
e		0.050 BSC	
f	0.0099		0.0196
θ1	0°		8°

**Notes:**

1. Complies with JEDEC specification MS-012 dimensions.
2. All linear dimensions in millimeters.

**8-LEAD TSSOP (Y)**



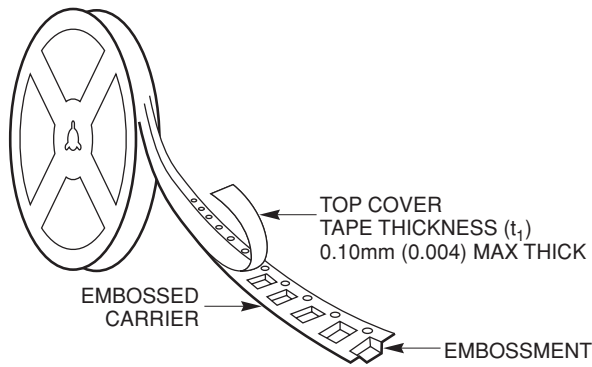
SYMBOL	MIN	NOM	MAX
A			1.20
A1	0.05		0.15
A2	0.80	0.90	1.05
b	0.19		0.30
c	0.09		0.20
D	2.90	3.00	3.10
E	6.30	6.4	6.50
E1	4.30	4.40	4.50
e		0.65 BSC	
L	0.50	0.60	0.75
$\theta 1$	0.00		8.00

Notes:

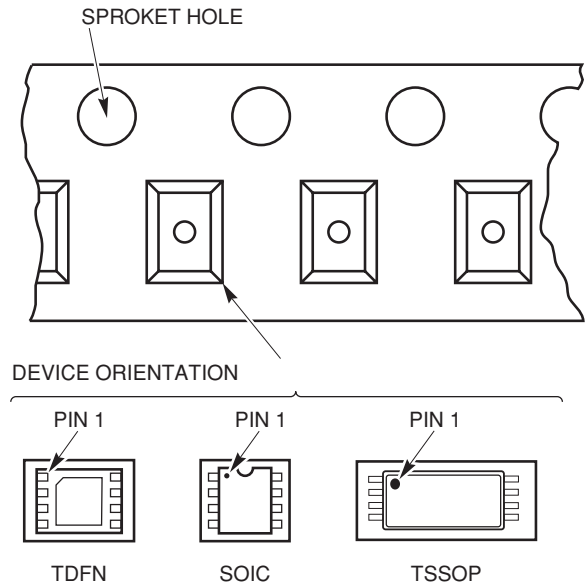
1. All dimensions in millimeters.

## TAPE AND REEL

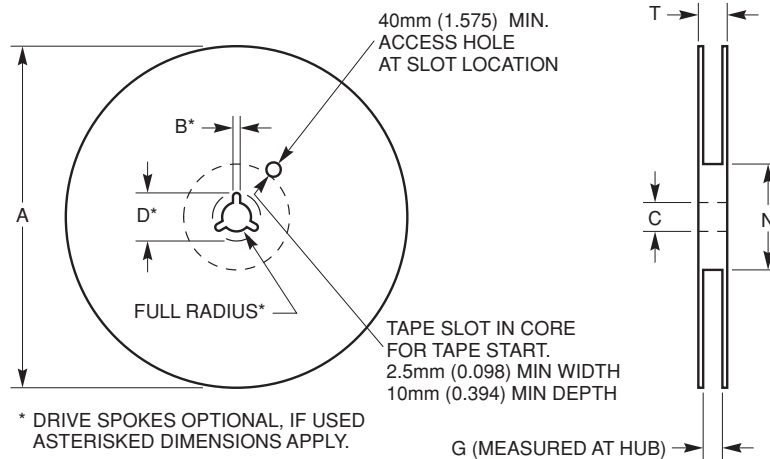
### Direction of Feed



### Device Orientation



### Reel Dimensions<sup>(1)</sup>



### Embossed Carrier Dimensions

TAPE SIZE	A		B MIN	C	D* MIN	N MIN	G	T MAX
	MAX	QTY/REEL						
12MM	330 (13.00)	3000	1.5 (0.059)	12.80 (0.504) 13.20 (0.5200)	20.2 (0.795)	50 (1.969)	12.4 (0.488) 14.4 (0.558)	18.4 (0.724)

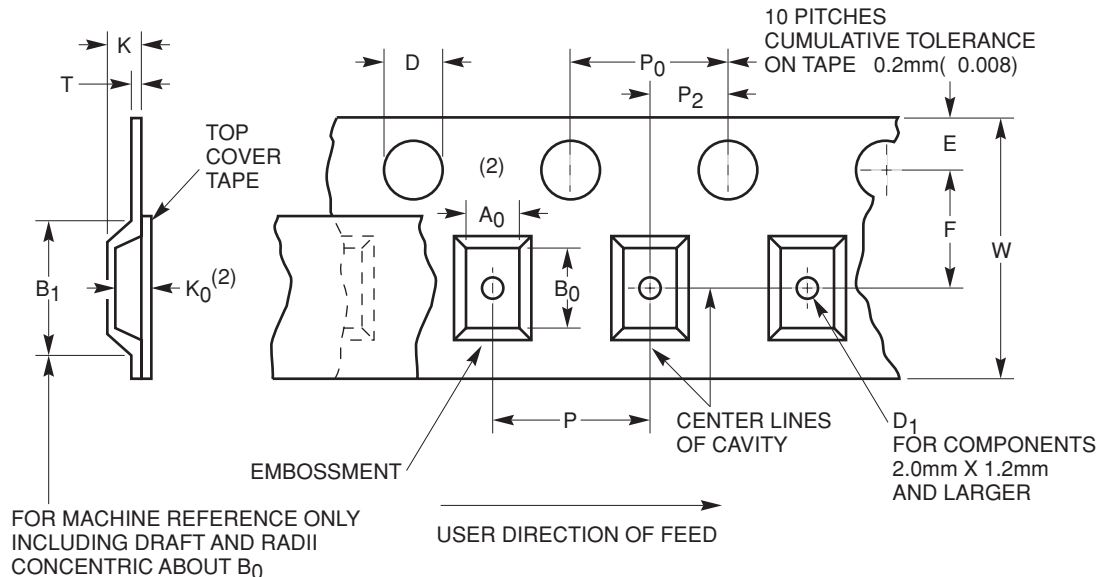
### Component/Tape Size Cross-Reference

Component	Package Type	Tape Size (W)	Part Pitch (P)
8L SOIC, TSSOP	V, Y	12mm	8mm

#### Notes:

(1) Metric dimensions will govern; English measurements rounded, for reference only and in parentheses.

**Embossed Carrier Dimensions (12 Pape Only)**



**Embossed Tape—Constant Dimensions<sup>(1)</sup>**

Tape Sizes	D	E	P <sub>0</sub>	T Max.	D1 Min.	A <sub>0</sub> B <sub>0</sub> K <sub>0</sub> <sup>(2)</sup>
12mm	1.5 (0.059)	1.65 (0.065)	3.9 (0.153)	400 (0.016)	1.5 (0.059)	
	1.6 (0.063)	1.85 (0.073)	4.1 (0.161)			

**Embossed Tape—Variable Dimensions<sup>(1)</sup>**

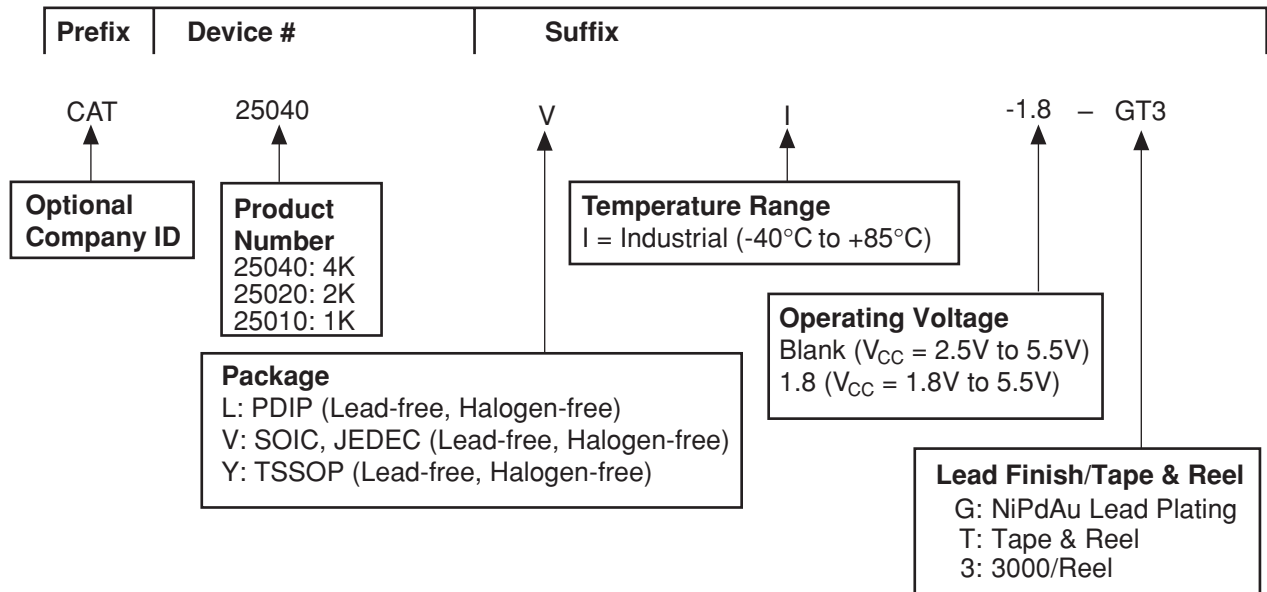
Tape Sizes	B <sub>1</sub> Max.	F	K Max.	P <sub>2</sub>	R Min.	W	P
12mm	8.2 (0.0323)	5.45 (0.0215)	4.5 (0.177)	1.95 (0.077)	30 (1.181)	11.7 (0.460)	7.9 (0.275)
		5.55 (0.0219)		2.05 (0.081)		12.3 (0.484)	8.1 (0.355)

Note:

(1) Metric dimensions will govern; English measurements rounded, for reference only and in parentheses.

(2) A<sub>0</sub> B<sub>0</sub> K<sub>0</sub> are determined by component size. The clearance between the component and the cavity must be within 0.05 (0.002) min. to 0.65 (0.026) max. for 12mm tape, 0.05 (0.002) min. to 0.90 (0.035) max. for 16mm tape, and 0.05 (0.002) min. to 1.00 (0.039) max. for 24mm tape and larger. The component cannot rotate more than 20° within the determined cavity, see Component Rotation.

**ORDERING INFORMATION**

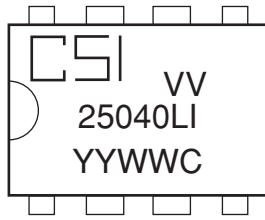


**Notes:**

(1) The device used in the above example is a CAT25040VI-1.8GT3 (SOIC, Industrial Temperature, 1.8 Volt to 5.5 Volt Operating Voltage, Tape & Reel)

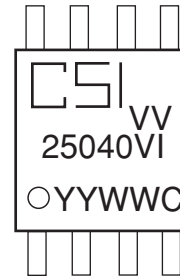
**PACKAGE MARKING**

**8-Lead PDIP**



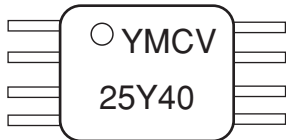
CSI = Catalyst Semiconductor, Inc.  
 25040L = Device Code:  
     25010L  
     25020L  
     25040L  
 I = Temperature Range  
 YY = Production Year  
 WW = Production Week  
 C = Product Revision  
 VV = Voltage Range  
     1.8V - 5.5V = 18  
     2.5V - 5.5V = Blank

**8-Lead SOIC**



CSI = Catalyst Semiconductor, Inc.  
 25040V = Device Code:  
     25010V  
     25020V  
     25040V  
 I = Temperature Range  
 YY = Production Year  
 WW = Production Week  
 C = Product Revision  
 VV = Voltage Range  
     1.8V - 5.5V = 18  
     2.5V - 5.5V = Blank

**8-Lead TSSOP**



Y = Production Year  
 M = Production Month  
 C = Die Revision  
 25Y40 = Device Code:  
     25Y01  
     25Y02  
     25Y04  
 I = Industrial Temperature Range  
 V = Voltage Range  
     1.8V - 5.5V = 8  
     2.5V - 5.5V = Blank

Notes:

(1) The circle on the package marking indicates the location of Pin 1.



## REVISION HISTORY

Date	Rev.	Reason
10/13/05	N	Update D.C. Operating Characteristics Update Ordering Information
12/09/05	O	Update Pin Configuration Update D.C. Operating Characteristics Update Pin Impedance Characteristics Update Figure 2, 3, 4, 6, 8 Add Tape and Reel Update Ordering Information
03/21/06	P	Update D.C. Operating Characteristics Update A.C. Characteristics Update Pin Description

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