

**Table 14: Application Example—Push-Button Control**

Control Step	Function	Action
1	Select record/playback mode	$P/\bar{R}$ = As desired
2A	Begin playback	$P/\bar{R}$ = HIGH, $\overline{CE}$ = Pulsed LOW
2B	Begin record	$P/\bar{R}$ = LOW, $\overline{CE}$ = Pulsed LOW
3	Pause record or playback	$\overline{CE}$ = Pulsed LOW
4A	End playback	Automatic at $\overline{EOM}$ marker or PD = Pulsed HIGH
4B	End record	PD = Pulsed HIGH

**Table 15: Application Example—Passive Component Functions**

Part	Function	Comments
R2	Release time constant	Sets release time for AGC
R4	Series limiting resistor	Reduces level to prevent distortion at higher supply voltages
R6, R7	Pull-up and pull-down resistors	Defines static state of inputs
C1, C4, C5	Power supply capacitors	Filters and bypass of power supply
C2	Attack/Release time constant	Sets attack/release time for AGC
C3	Low-frequency cutoff capacitor	Provides additional pole for low-frequency cutoff

**Table 16: Push-Button Parameters**

Symbol	Characteristic	Min	Typ (1)	Max	Units	Conditions
$T_{CE}$	$\overline{CE}$ Pulse Width [Start/Pause]		300		nsec	
$T_{SET}$	Control/Address Setup Time		300		nsec	
$T_{PUD}$	Power-Up Delay		25 31.25 37.25 50.0		msec msec msec msec	
$T_{PD}$	PD Pulse Width [Stop/Reset]		300		nsec	
$T_{RUN}$	$\overline{CE}$ to EOM HIGH	25		400	nsec	
$T_{PAUSE}$	$\overline{CE}$ to EOM LOW	50		400	nsec	
$T_{DB}$	$\overline{CE}$ HIGH Debounce		70 85 105 135	105 135 160 215	msec msec msec msec	



DEVICE PHYSICAL DIMENSIONS

Figure 9: 28-Lead 8x13.4mm Plastic Thin Small Outline Package (TSOP) Type I (E)

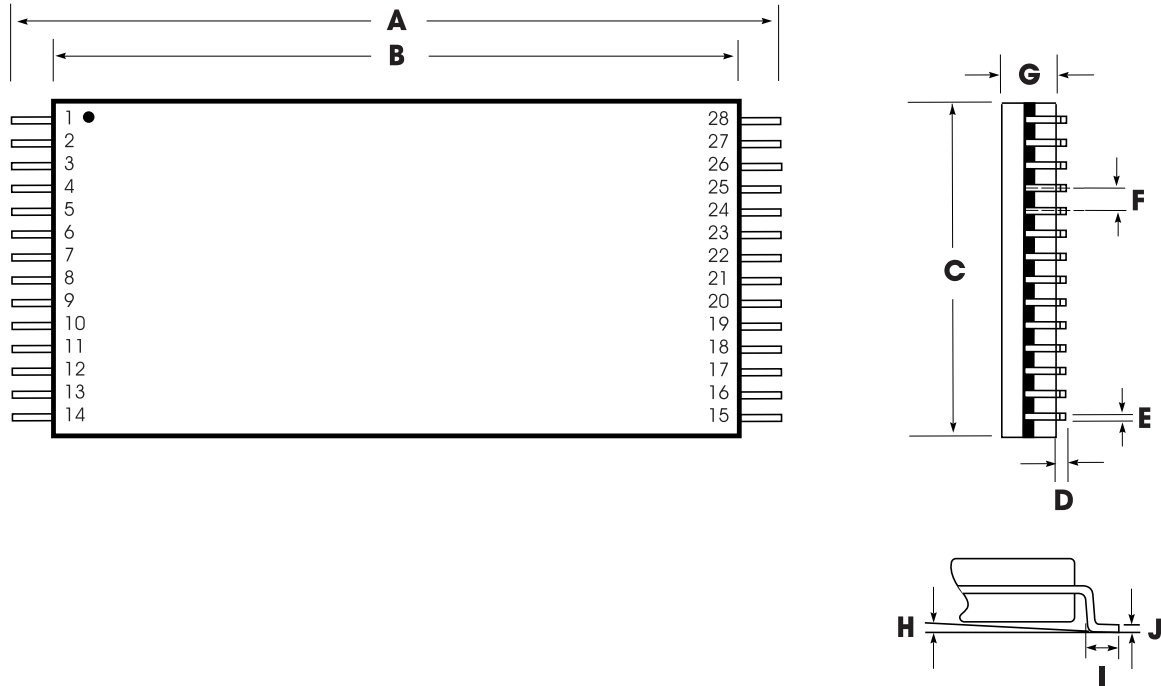


Table 17: Plastic Thin Small Outline Package (TSOP) Type I (E) Dimensions

	INCHES			MILLIMETERS		
	Min	Nom	Max	Min	Nom	Max
A	0.520	0.528	0.535	13.20	13.40	13.60
B	0.461	0.465	0.469	11.70	11.80	11.90
C	0.311	0.315	0.319	7.90	8.00	8.10
D	0.002		0.006	0.05		0.15
E	0.007	0.009	0.011	0.17	0.22	0.27
F		0.0217			0.55	
G	0.037	0.039	0.041	0.95	1.00	1.05
H	0°	3°	6°	0°	3°	6°
I	0.020	0.022	0.028	0.50	0.55	0.70
J	0.004		0.008	0.10		0.21

**NOTE:** Lead coplanarity to be within 0.004 inches.

Figure 10: 28-Lead 0.600-Inch Plastic Dual Inline Package (PDIP) (P)

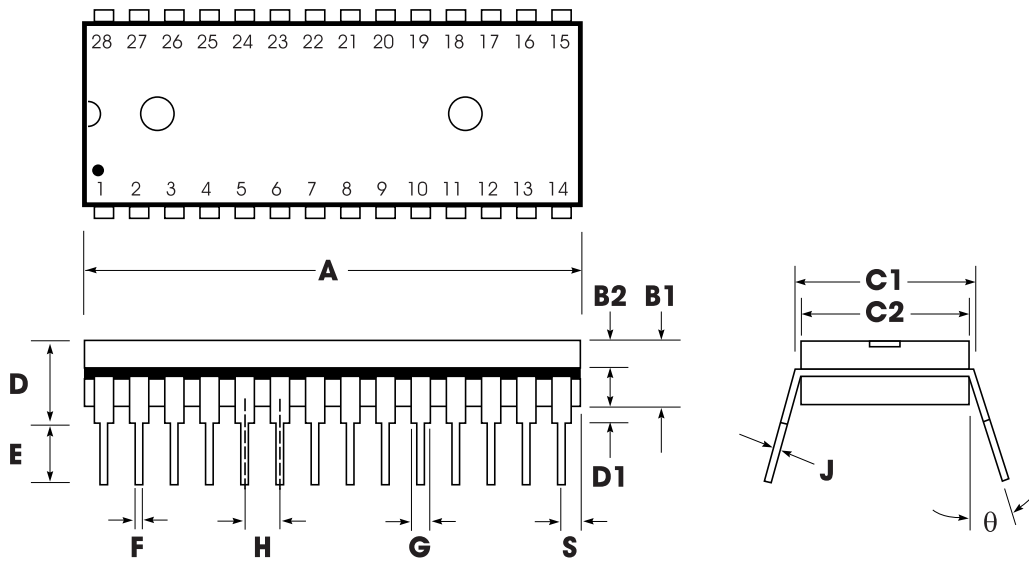


Table 18: Plastic Dual Inline Package (PDIP) (P) Dimensions

	INCHES			MILLIMETERS		
	Min	Nom	Max	Min	Nom	Max
A	1.445	1.450	1.455	36.70	36.83	36.96
B1		0.150			3.81	
B2	0.065	0.070	0.075	1.65	1.78	1.91
C1	0.600		0.625	15.24		15.88
C2	0.530	0.540	0.550	13.46	13.72	13.97
D			0.19			4.83
D1	0.015			0.38		
E	0.125		0.135	3.18		3.43
F	0.015	0.018	0.022	0.38	0.46	0.56
G	0.055	0.060	0.065	1.40	1.52	1.65
H		0.100			2.54	
J	0.008	0.010	0.012	0.20	0.25	0.30
S	0.070	0.075	0.080	1.78	1.91	2.03
q	0°		15°	0°		15°

**NOTE:** Lead coplanarity to be within 0.004 inches.

Figure 11: 32-Lead 8x20mm Plastic Thin Small Outline Package (TSOP) Type I (T)

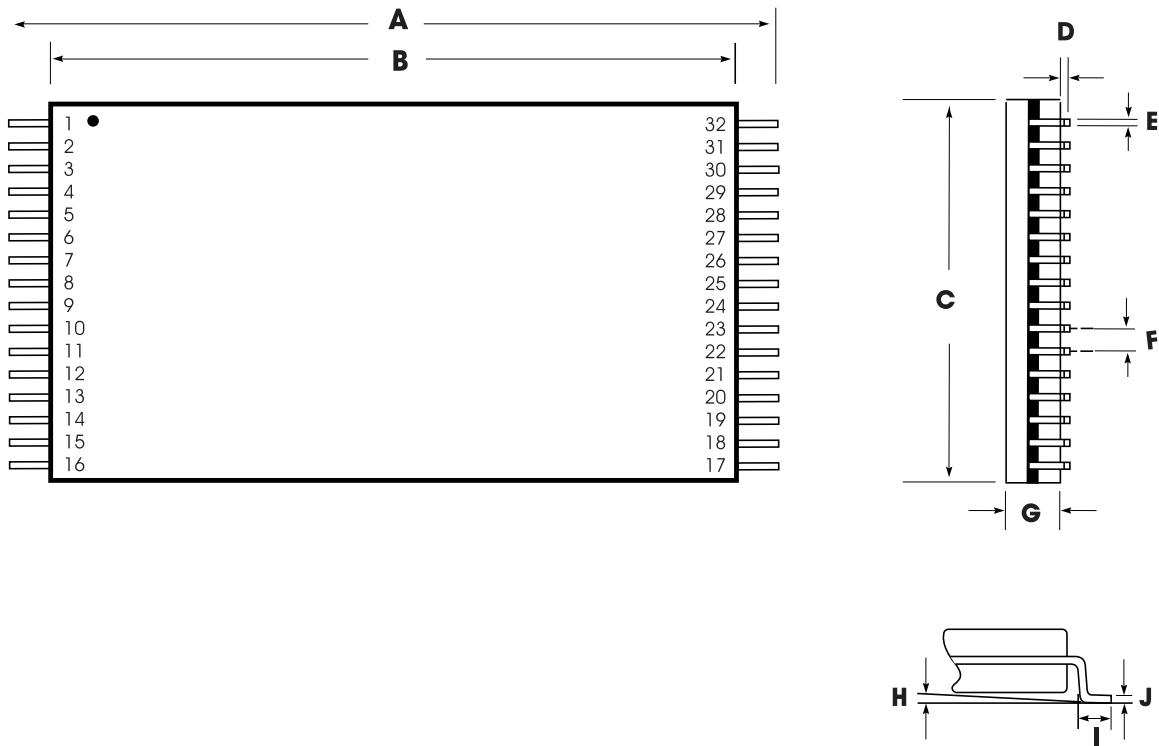


Table 19: Plastic Thin Small Outline Package (TSOP) Type I (T) Dimensions

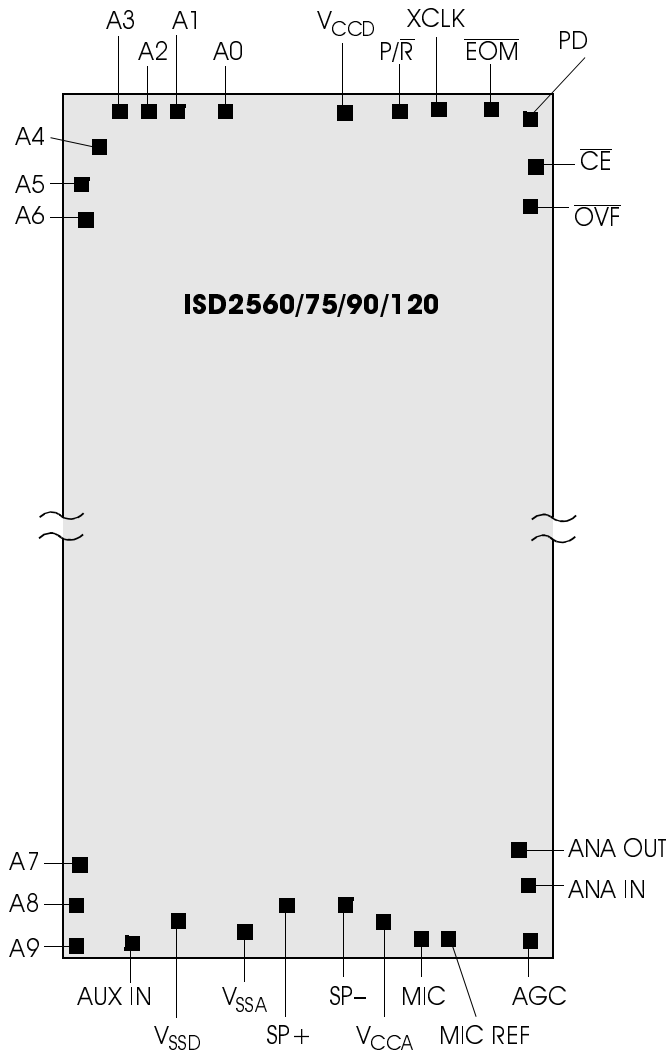
	INCHES			MILLIMETERS		
	Min	Nom	Max	Min		Max
A	0.780	0.787	0.795	19.80	20.00	20.20
B	0.720	0.724	0.728	18.30	18.40	18.50
C	0.311	0.315	0.319	7.90	8.00	8.10
D	0.002		0.006	0.05		0.15
E	0.006	0.009	0.011	0.17	0.22	0.27
F		0.0197			0.50	
G	0.037	0.039	0.041	0.95	1.00	1.05
H	0°	3°	5°	0°	3°	5°
I	0.020	0.024	0.028	0.50	0.60	0.70
J	0.004		0.008	0.10		0.21

**NOTE:** Lead coplanarity to be within 0.002 inches.

Figure 12: ISD2560/75/90/120 Products *Current Bonding Physical Layout*<sup>1</sup> (Unpackaged Die)

**ISD2560/75/90/120<sup>2</sup>**

- I. Die Dimensions  
 X: 187 ± 1 mils  
 Y: 399 ± 1 mils
- II. Die Thickness<sup>2</sup>  
 17.5 ± 1 mils
- III. Pad Opening  
 109 x 109 microns  
 4.3 x 4.3 mils



1. The backside of die is internally connected to V<sub>SS</sub>. It **MUST NOT** be connected to any other potential or damage may occur.
2. Die thickness is subject to change, please contact ISD factory for status.

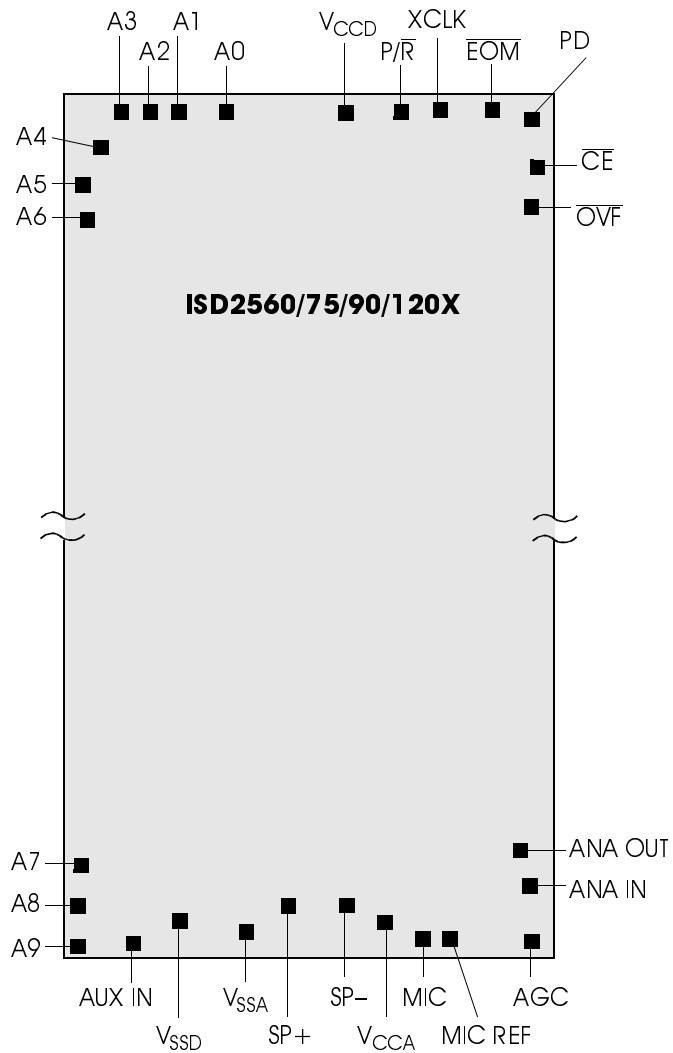
**Table 20: ISD2560/75/90/120 Products *Current* PIN/PAD Designations, with Respect to Die Center ( $\mu\text{m}$ )**

Pin	Pin Name	X Axis	Y Axis
A0	Address 0	-1148.9	4898.2
A1	Address 1	-1406.9	4898.2
A2	Address 2	-1661.9	4898.2
A3	Address 3	-1916.9	4898.2
A4	Address 4	-2069.9	4608.2
A5	Address 5	-2194.9	4358.2
A6	Address 6	-2194.9	4108.2
A7	Address 7	-2194.9	-4212.3
A8	Address 8	-2194.9	-4456.3
A9	Address 9	-2076.4	-4897.3
AUX IN	Auxiliary Input	-1607.9	-4868.3
V <sub>SSD</sub>	V <sub>SS</sub> Digital Power Supply	-1343.9	-4850.8
V <sub>SSA</sub>	V <sub>SS</sub> Analog Power Supply	-551.9	-4884.8
SP+	Speaker Output +	-111.4	-4790.8
SP-	Speaker Output -	425.6	-4790.8
V <sub>CCA</sub>	V <sub>CC</sub> Analog Power Supply	865.1	-4848.32
MIC	Microphone Input	1320.7	-4897.3
MIC REF	Microphone Reference	1605.1	-4897.3
AGC	Automatic Gain Control	1877.6	-4871.3
ANA IN	Analog Input	2202.11	-4269.8
ANA OUT	Analog Output	2123.1	-3910.8
$\overline{\text{OVF}}$	Overflow Output	2142.6	4154.7
$\overline{\text{CE}}$	Chip Enable Input	2202.1	4558.7
PD	Power Down Input	2048.1	4898.2
EOM	End of Message	1648.1	4865.7
XCLK	No Connect (optional)	1221.1	4898.2
P/ $\overline{\text{R}}$	Playback/Record	965.6	4898.2
V <sub>CCD</sub>	V <sub>CC</sub> Digital Power Supply	646.1	4895.7

Figure 13: ISD2560/75/90/120 Products *Future Bonding Physical Layout*<sup>1</sup> (Unpackaged Die)

**ISD2560/75/90/120X<sup>2</sup>**

- I. Die Dimensions  
 X: 149.5 ±1 mils  
 Y: 262.0 ±1 mils
- II. Die Thickness<sup>2</sup>  
 11.8 ±.4 mils
- III. Pad Opening  
 111 x 111 microns  
 4.4 x 4.4 mils



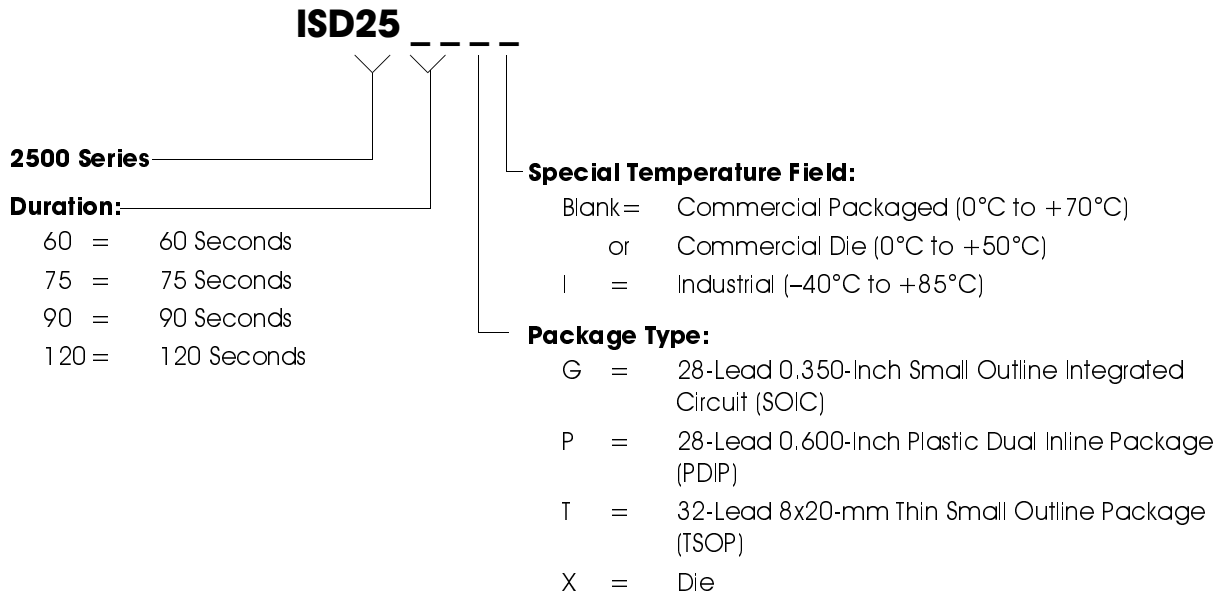
1. The backside of die is internally connected to V<sub>SS</sub>. It **MUST NOT** be connected to any other potential or damage may occur.
2. Die thickness is subject to change, please contact ISD factory for status and availability.

**Table 21: ISD2560/75/90/120 Products *Future* PIN/PAD Designations, with Respect to Die Center ( $\mu\text{m}$ )**

Pin	Pin Name	X Axis	Y Axis
A0	Address 0	-897.9	3135.2
A1	Address 1	-1115.4	3135.2
A2	Address 2	-1331.0	3135.2
A3	Address 3	-1544.0	3135.2
A4	Address 4	-1640.4	2888.9
A5	Address 5	-1698.2	2671.0
A6	Address 6	-1698.2	2441.5
A7	Address 7	-1731.2	-2583.2
A8	Address 8	-1731.2	-2768.4
A9	Address 9	-1731.2	-3050.8
AUX IN	Auxiliary Input	-1410.1	-3115.7
V <sub>SSD</sub>	V <sub>SS</sub> Digital Power Supply	-1112.8	-3096.2
V <sub>SSA</sub>	V <sub>SS</sub> Analog Power Supply	-407.8	-3138.5
SP+	Speaker Output +	-47.4	-3067.7
SP-	Speaker Output -	386.9	-3067.7
V <sub>CCA</sub>	V <sub>CC</sub> Analog Power Supply	746.5	-3110.4
MIC	Microphone Input	1101.2	-3146.0
MIC REF	Microphone Reference	1294.7	-3146.0
AGC	Automatic Gain Control	1666.4	-3130.3
ANA IN	Analog Input	1728.6	-2654.0
ANA OUT	Analog Output	1700.9	-2411.0
$\overline{\text{OVF}}$	Overflow Output	1340.9	3121.7
$\overline{\text{CE}}$	Chip Enable Input	1726.7	2824.4
PD	Power Down Input	1730.5	3094.0
EOM	End of Message	1340.9	3121.7
XCLK	No Connect (optional)	986.5	3160.7
P/ $\overline{\text{R}}$	Playback/Record	807.2	3163.4
V <sub>CCD</sub>	V <sub>CC</sub> Digital Power Supply	544.7	3159.2

## ORDERING INFORMATION

### Product Number Descriptor Key



When ordering ISD2560/75/90/120 products, please refer to the following valid part numbers.

Part Number	Part Number	Part Number	Part Number
ISD2560G	ISD2575G	ISD2590G	ISD25120G
ISD2560GI	ISD2575GI	ISD2590P	ISD25120P
ISD2560P	ISD2575P	ISD2590T	ISD25120X
ISD2560PI	ISD2575PI	ISD2590X	
ISD2560T	ISD2575T		
ISD2560TI	ISD2575TI		
ISD2560X	ISD2575X		

For the latest product information, access ISD's worldwide website at <http://www.isd.com>.



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