GLOBALTECH SEMICONDUCTOR

GS75232

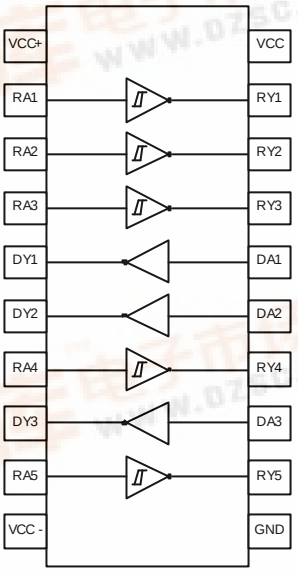
Multiple RS-232 Drivers & Receivers

Product Description

The GS75232 are monolithic device containing 3 independent drives and 5 receivers. These are designed to interface between date terminal equipment and date communication equipment as designed by EIA-232-D.

Features

- Meets standard EIA-232-D (Revision of RS-232-C)
- Drivers
  - Current Limited Output : 10 mA Typical
  - Power-off Output Impedance : 300 Ω Min
  - Slew Rate Control by Load Capacitor
  - Flexible Supply Voltage Range
  - Input Compatible with Most TTL and DTL Circuits
- Receivers
  - Input Resistance : 3 kΩ to 7 kΩ
  - Input Signal Range : ± 30 V
  - Built-in Input Hysteresis (Double Threshold)

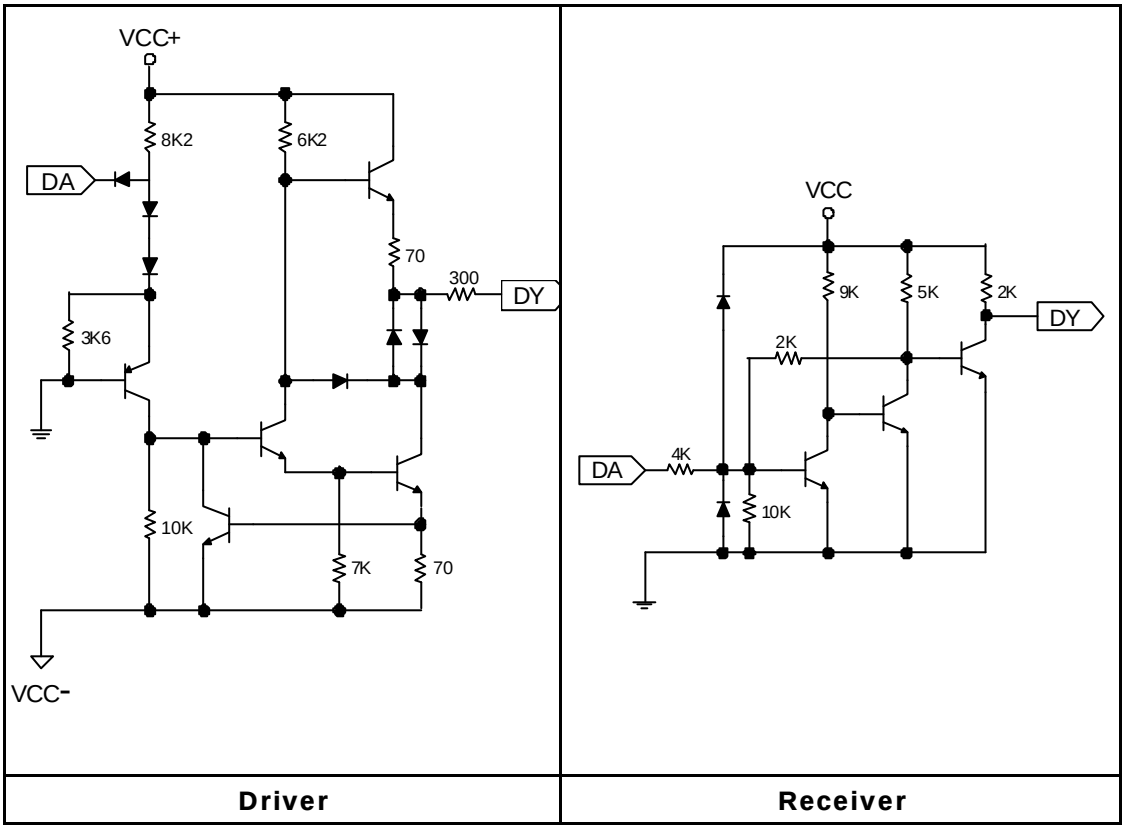


GS75232

Pin Description

Name	Pin No	Function	Name	Pin No	Function
V_{CC+}	1	Driver Section Supply +	V_{CC-}	10	Driver Section Supply -
DA1	16	Driver Input	DY1	5	Driver Output
DA2	15		DY2	6	
DA3	13		DY3	8	
V_{CC}	20	Receiver Section Supply	GND	11	Ground
RA1	2	Receiver Input	RY1	19	Receiver Output
RA2	3		RY2	18	
RA3	4		RY3	17	
RA4	7		RY4	14	
RA5	9		RY5	12	

Representative Schematic Diagram



Driver	Receiver

Ordering Information

Device	Package
GS75232S	SOIC-20
GS75232SS	SSOP-20
GS75232TS	TSSOP-20

"F" means Lead Free part.

*Request for other voltages, please contact factory directly.

Absolute Maximum Ratings

Symbol	Parameter	Rating	Unit
V_{CC+}	Supply Voltage	15	V
V_{CC-}	Supply Voltage	-15	V
V_{CC}	Supply Voltage	10	V
VI (Driver)	Input Voltage	-15 to +7	V
VI (Reciver)	Input Voltage	± 30	V
VO (Driver)	Output Voltage	-15 to +15	V
PT	Continuous Power Dissipation (Below 25 ^{o}C)	1.0	W
T_{STG}	Storage Temperature	-65 to +175	^{o}C
Top	Operating Temperature	0 to +75	^{o}C

Electrical Characteristics

Supply Current (V_{CC} = 5V, T_A = 25 °C)

Symbol	Parameter	Test Condition		Min	Max	Unit
I_{CC+}	Supply Current from V_{CC+}	V_{CC+} = 9 V No Load	V_{IN} = 1.9V V_{IN} = 0.8V	-	15 4.5	mA
		V_{CC+} = 12 V No Load	V_{IN} = 1.9V V_{IN} = 0.8V	-	19 5.5	
		V_{CC+} = 15 V No Load	V_{IN} = 1.9V V_{IN} = 0.8V	-	25 9	
I_{CC-}	Supply Current from V_{CC-}	V_{CC-} = -9 V No Load	V_{IN} = 1.9V V_{IN} = 0.8V	-	-15 -3.2	mA
		V_{CC-} = -12 V No Load	V_{IN} = 1.9V V_{IN} = 0.8V	-	-19 -3.2	
		V_{CC-} = -15 V No Load	V_{IN} = 1.9V V_{IN} = 0.8V	-	-25 -3.2	
I_{CC}	Supply Current from V_{CC}	V_{CC} = 5 V	V_{IN} = 5.0V	-	30	mA

Receiver Section

Symbol	Parameter	Test Conditions	Min	Max	Unit
VT+	Positive-Going Threshold Voltage		1.75	2.25	V
VT-	Negative-Going Threshold Voltage		0.75	1.25	V
V_{OH}	High Level Output Voltage	V_I = 0.75V, I_{OL} =-0.5mA	2.6	5	V
		Input Open, I_{OL} = -0.5 mA	2.6	5	
V_{OL}	Low Level Output Voltage	V_I = 3V, I_{OL} = 10 mA	-	0.45	V
I_{IH}	High-Level Input Current	V_I = 25V	3.6	8.3	mA
		V_I = 3V	0.43	-	
I_{IL}	Low-Level Input Current	V_I = -25V	-3.6	-8.3	mA
		V_I = -3V	-0.43	-	
I_{OS}	Short-Circuit Output Current		-3 (tip)		mA

Receiver Switching Characteristic (V_{CC} = 5V)

Symbol	Parameter	Test Conditions	Min	Max	Unit
t_{PLH}	Propagation Delay Time, Low-To-High-Level Output	C_L = 15 ρF R_L = 3.9 kΩ	-	150	ns
t_{PHL}	Propagation Delay Time, High -To- Low -Level Output	C_L = 15 ρF R_L = 390 kΩ	-	50	ns
t_{TLH}	Transition Time, Low-To-High-Level Output	C_L = 15 ρF R_L = 3.9 kΩ	-	175	ns
t_{THL}	Transition Time, High -To- Low -Level Output	C_L = 15 ρF R_L = 390 kΩ	-	20	ns

Driver Section

Symbol	Parameter	Test Conditions		Min	Max	Unit
V_{IH}	High Level Input Voltage	V_{CC+} = 9 V V_{CC-} = -9 V		1.9	-	V
V_{IL}	Low Level Input Voltage			-	0.8	V
V_{OH}	High Level Output Voltage	V_{IL} = 0.8V RL = 3 kΩ	V_{CC+} = 9 V V_{CC-} = -9 V	6	-	V
			V_{CC+} = 13.2 V V_{CC-} = -13.2 V	9	-	
V_{OL}	Low Level Output Voltage	V_{IH} = 1.9V RL = 3 kΩ	V_{CC+} = 9 V V_{CC-} = -9 V	-	-6	V
			V_{CC+} = 13.2 V V_{CC-} = -13.2 V	-	-9	
I_{IH}	High Level Input Current	V_I = 5V		-	10	µA
I_{IL}	Low Level Input Current	V_I = 0		-	-1.6	mA
$I_{OS(H)}$	Short Circuit Output Current at High Level	V_I = 0.8V V_O = 0		-6	-12	mA
$I_{OS(L)}$	Short Circuit Output Current at Low Level	V_I = 1.9V V_O = 0		6	12	mA
R_O	Output Resistance, Power Off	V_{CC+} = 0, V_{CC-} = 0 V_O = -2V to 2V		300	-	Ω

Driver Switching Characteristic (V_{CC+} = 9V, V_{CC-} = -9V T_A = 25 °C)

Symbol	Parameter	Test Conditions	Min	Max	Unit
t_{PLH}	Propagation Delay Time, Low-To-High-Level Output	RL = 3 kΩ CL = 15 µF See Figure 1	-	500	ns
t_{PHL}	Propagation Delay Time, High -To- Low -Level Output		-	175	ns
t_{TLH}	Transition Time, Low-To-High-Level Output *		-	100	ns
t_{THL}	Transition Time, High -To- Low -Level Output*		-	75	ns
t_{TLH}	Transition Time, Low-To-High-Level Output**	RL = 3 kΩ to 7 kΩ CL = 2500 ρF See Figure 1	2.5 (tip)		µs
t_{THL}	Transition Time, High-To-Low -Level Output**		3.0 (tip)		µs

*- Measured between 10 % and 90 % Points of Output Waveform

** - Measured between +3V and -3V Points on the Output Waveform (EIA-232-D Condition)

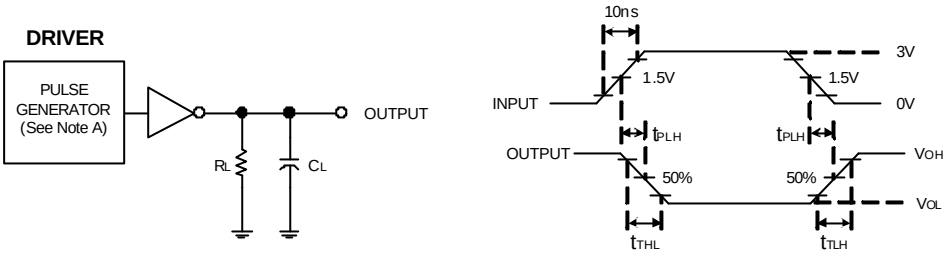
Receiver Section

Symbol	Parameter	Test Conditions	Min	Max	Unit
VT+	Positive-Going Threshold Voltage		1.75	2.25	V
VT-	Negative-Going Threshold Voltage		0.75	1.25	V
V_{OH}	High Level Output Voltage	V_I = 0.75V, I_{OL} =-0.5mA	2.6	5	V
		Input Open, I_{OL} = -0.5 mA	2.6	5	
V_{OL}	Low Level Output Voltage	V_I = 3V, I_{OL} = 10 mA	-	0.45	V
I_{IH}	High-Level Input Current	V_I = 25V	3.6	8.3	mA
		V_I = 3V	0.43	-	
I_{IL}	Low-Level Input Current	V_I = -25V	-3.6	-8.3	mA
		V_I = -3V	-0.43	-	
I_{OS}	Short-Circuit Output Current		-3 (tip)		mA

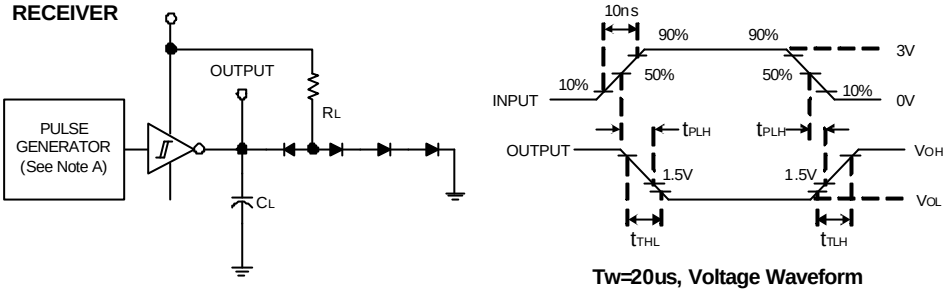
Receiver Switching Characteristic (V_{CC} = 5V)

Symbol	Parameter	Test Conditions	Min	Max	Unit
t_{PLH}	Propagation Delay Time, Low-To-High-Level Output	C_L = 15 ρF R_L = 3.9 kΩ	-	150	ns
t_{PHL}	Propagation Delay Time, High -To- Low -Level Output	C_L = 15 ρF R_L = 390 kΩ	-	50	ns
t_{TLH}	Transition Time, Low-To-High-Level Output	C_L = 15 ρF R_L = 3.9 kΩ	-	175	ns
t_{THL}	Transition Time, High -To- Low -Level Output	C_L = 15 ρF R_L = 390 kΩ	-	20	ns

Typical Performance Characteristics



Voltage Waveform

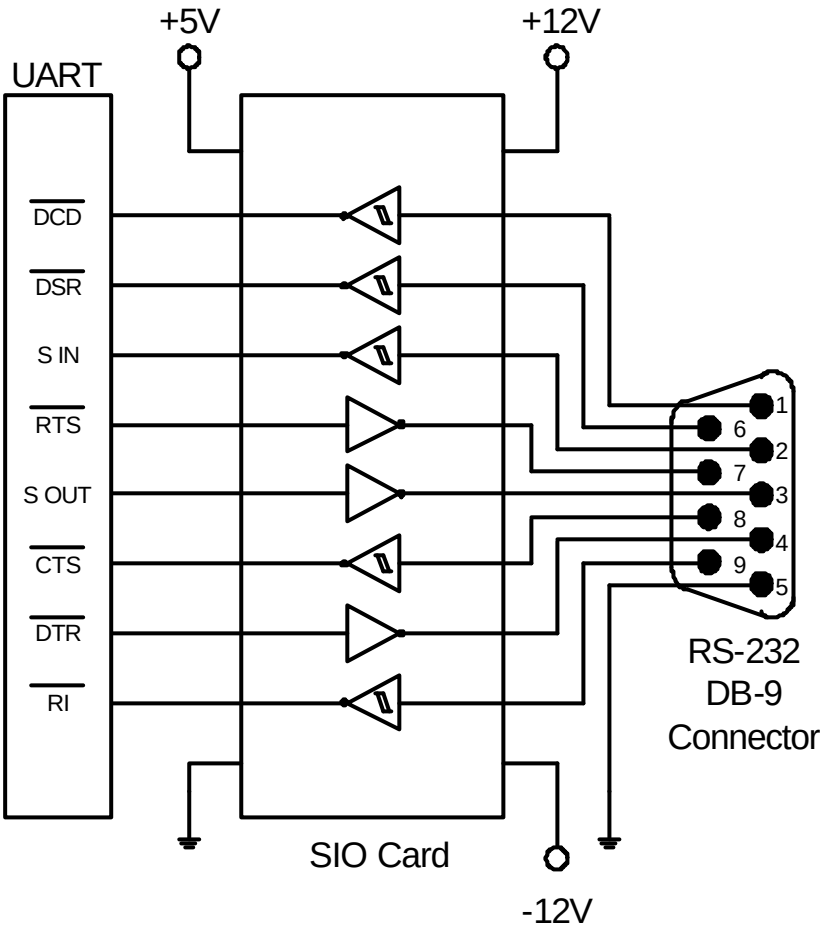


Tw=20us, Voltage Waveform

Note A. The pulse generator has the following characteristics. f = 200 KHz, Z_O = 50 Ω
B. C included probe and jig capacitance.
C. All diodes are 1N3064 or equivalent.

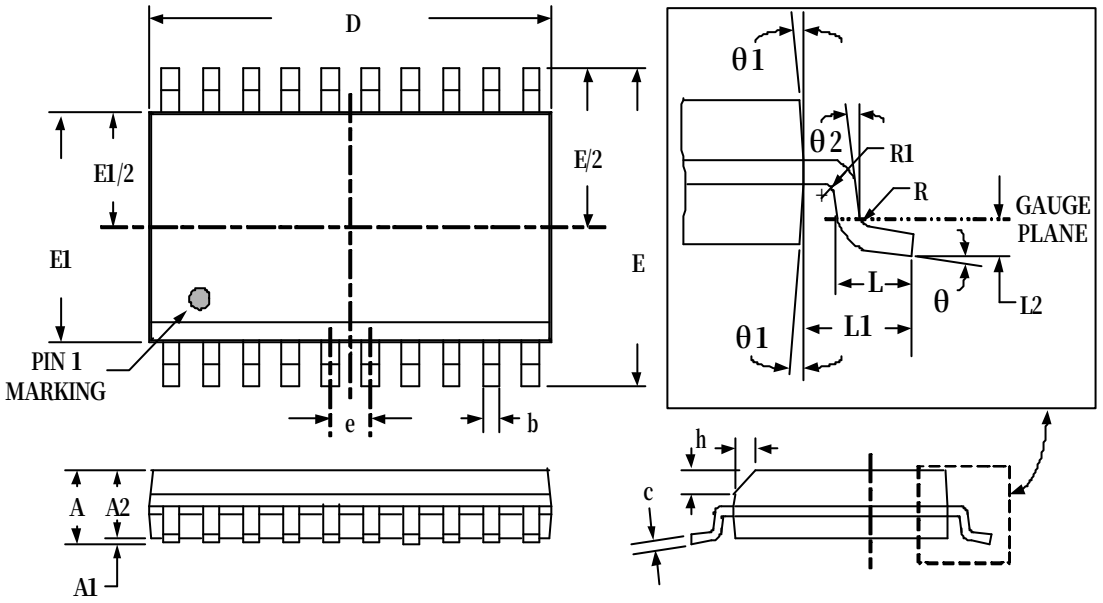
Fig1. Propagation and Transition Times

Applications Information



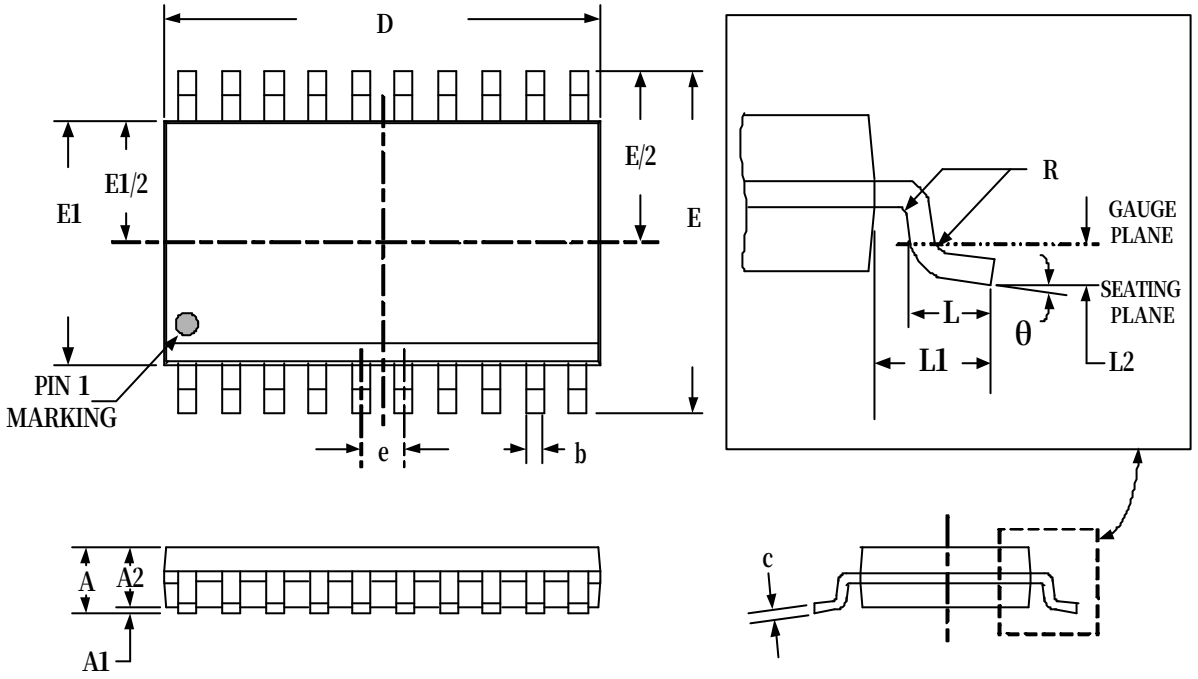
Package Dimensions

SOIC-20L



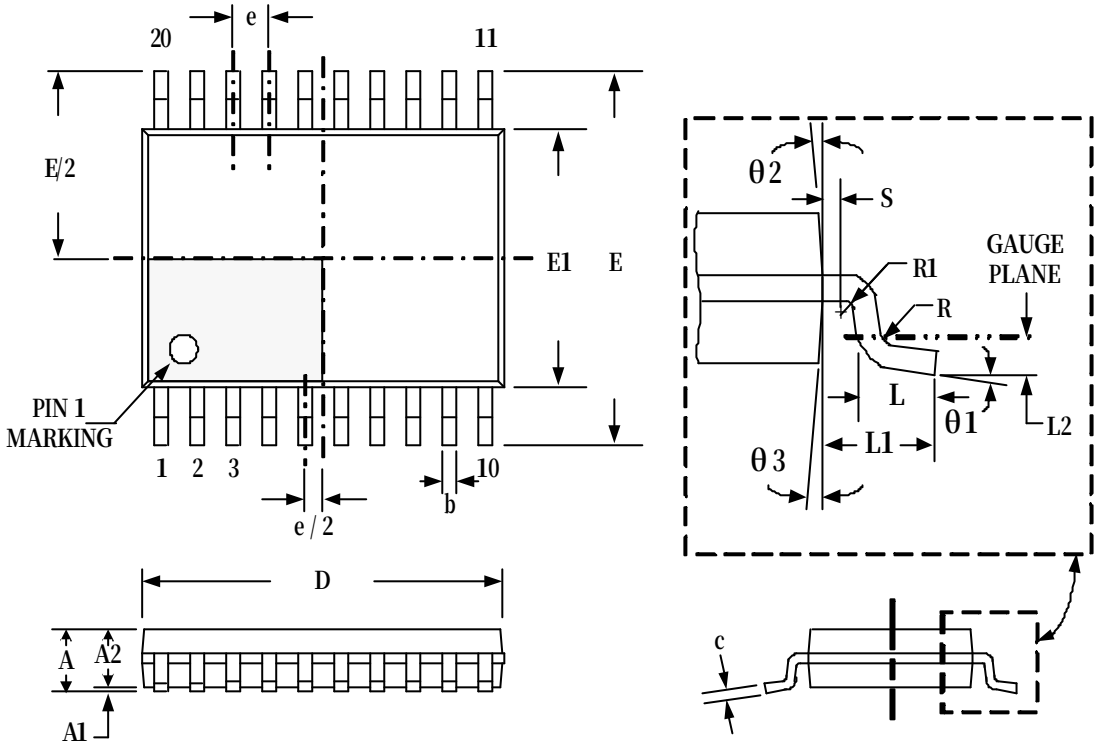
Dimensions			
SYMBOL	Millimeters		
	MIN	TYP	MAX
A	2.35	-	2.65
A1	0.10	-	0.30
A2	2.05	-	2.55
b	0.31	-	0.51
b1	0.27	-	0.48
c	0.20	-	0.33
D	-	12.80	-
E	-	10.30	-
E1	-	7.50	-
e	-	1.27	-
L	0.40	-	1.27
L1	-	1.40	-
L2	-	0.25	-
R	0.07	-	-
R1	0.07	-	-
h	0.25	-	0.75
θ	0°	-	8°
θ1	5°	-	15°
θ2	0°	-	-

SSOP-20L



Dimensions				
SYMBOL	Millimeters		Inches	
	MIN	MAX	MIN	MAX
A	-	2.0	-	.078
A1	0.05	-	.002	-
A2	1.65	1.85	.065	.073
b	0.22	0.38	.008	.015
c	0.09	0.25	.003	.010
D	6.90	7.50	.271	.295
E	7.40	8.20	.290	.323
E1	5.00	5.60	.197	.220
e	0.65 (TYP)		.026 (TYP)	
L	0.55	0.95	.021	.037
L1	1.25 (TYP)		.050 (TYP)	
L2	0.25 (TYP)		.010 (TYP)	
R	0.09	-	.003	-
θ	0°	8°	0°	8°

TSSOP-20L



Dimensions			
SYMBOL	Millimeters		
	MIN	TYP	MAX
A	-	-	1.20
A1	0.05	-	0.15
A2	0.80	1.00	1.05
b	0.19	-	0.30
b1	0.19	0.22	0.25
c	0.09	-	0.20
D	6.40	6.50	6.60
E	-	6.40	-
E1	4.30	4.40	4.50
e	-	0.65	-
L	0.45	0.60	0.75
L1	-	1.00	-
R	0.09	-	-
R1	0.09	-	-
S	0.20	-	-
θ1	0°	-	8°
θ2	-	12°	-
θ3	-	12°	-

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