

GS75232

Multiple RS-232 Drivers & Receivers

Product Description

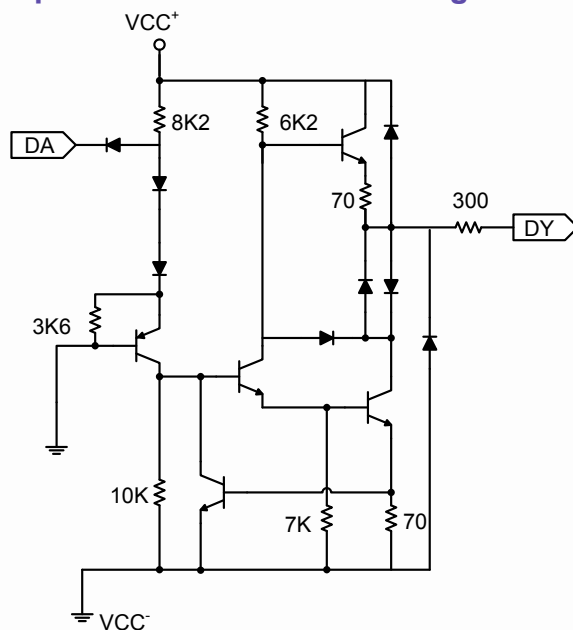
The GS75232 are monolithic device containing 3 independent drives and 5 receivers.

These are designed to interface between data terminal equipment and data communication equipment as designed by EIA-232-D.

Features

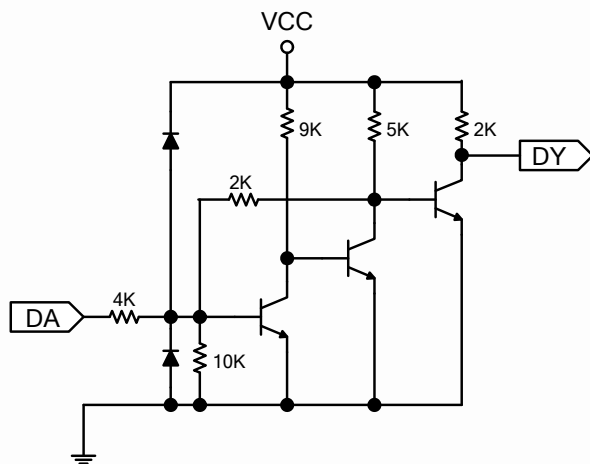
- Meets standard EIA-232-D(Revision of RS-232-C)
- Drivers
 - Current Limited Output : 10 mA Typical
 - Power-off Output Impedance : 300Ω Min
 - Slew Rate Control by Load Capacitor
 - Flexible Supply Voltage Range
 - Input Compatible with Most TTL and DTL Circuits
- Receivers
 - Input Resistance : 3 kΩ to 7 kΩ
 - Input Signal Range : ± 30 V
 - Built-in Input Hysteresis (Double Threshold)
- RoHS Compliant, 100% Pb & Halogen Free

Representative Schematic Diagram



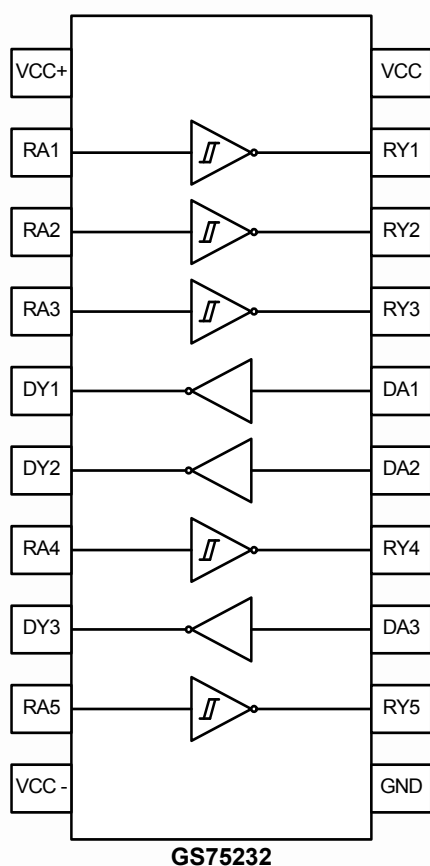
Resistor values shown are nominal

Driver



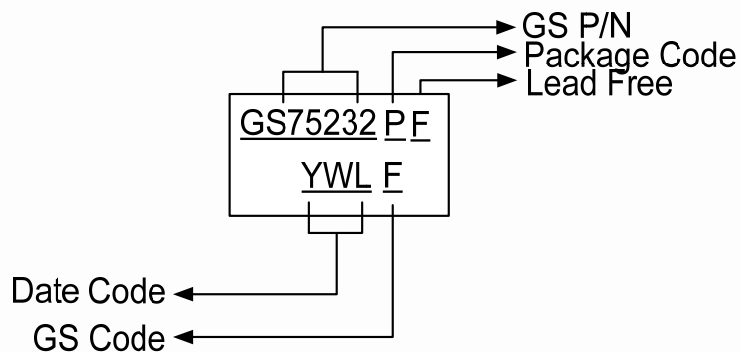
Receiver

Packages & Pin Assignments



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

Ordering Information



Device	Package
GS75232SF	SOIC-20
GS75232SSF	SSOP-20
GS75232TSSF	TSSOP-20

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
V_{IN} (Driver)	Input Voltage	-15 to +7	V
V_{IN} (Receiver)	Input Voltage	± 30	V
V_{OUT} (Driver)	Output Voltage	-15 to +15	V
P_D	Continuous Power Dissipation (Below 25 °C)	1.0	W
T_{STG}	Storage Temperature	-65 to +175	°C
Top	Operating Temperature	0 to +75	°C

Electrical Characteristics

Supply Current ($V_{CC} = 5V$, $T_A = 25^\circ C$)

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

Receiver Section

Symbol	Parameter	Test Conditions	Min	Max	Unit
V_{T+}	Positive-Going Threshold Voltage		1.75	2.25	V
V_{T-}	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, $I_{OL} = -0.5mA$	2.6	5	
V_{OL}	Low Level Output Voltage	$V_I = 3V$, $I_{OL} = 10mA$	-	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	$C_L = 15 \text{ pF}$ $R_L = 3.9 \text{ k}\Omega$	-	150	ns
T_{PHL}	Propagation Delay Time, High -To- Low -Level Output	$C_L = 15 \text{ pF}$ $R_L = 390 \text{ k}\Omega$	-	50	ns
T_{TLH}	Transition Time, Low-To-High-Level Output	$C_L = 15 \text{ pF}$ $R_L = 3.9 \text{ k}\Omega$	-	175	ns
T_{THL}	Transition Time, High -To- Low -Level Output	$C_L = 15 \text{ pF}$ $R_L = 390 \text{ k}\Omega$	-	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 R _L =3 kΩ	V _{CC+} = 9 V V _{CC-} = -9 V	6	-	V
			V _{CC+} = 13.2 V V _{CC-} = -13.2 V	9	-	V
V _{OL}	Low Level Output Voltage	V _{IH} =1.9V R _L =3 kΩ	V _{CC+} = 9 V V _{CC-} = -9 V	-	-6	V
			V _{CC+} = 13.2 V V _{CC-} = -13.2 V	-	-9	

Electrical Characteristics (Continue)

Symbol	Parameter	Test Conditions	Min	Max	Unit
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 ($V_{CC+} = 9V, V_{CC-} = -9V, T_A = 25^\circ C$)

Symbol	Parameter	Test Conditions	Min	Max	Unit
T_{PLH}	Propagation Delay Time, Low-To-High-Level Output	$R_L = 3\text{ k}\Omega$ $C_L = 15\text{ }\mu F$ (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**	$R_L = 3\text{ k}\Omega$ to $7\text{ k}\Omega$ $C_L = 2500\text{ pF}$ (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)

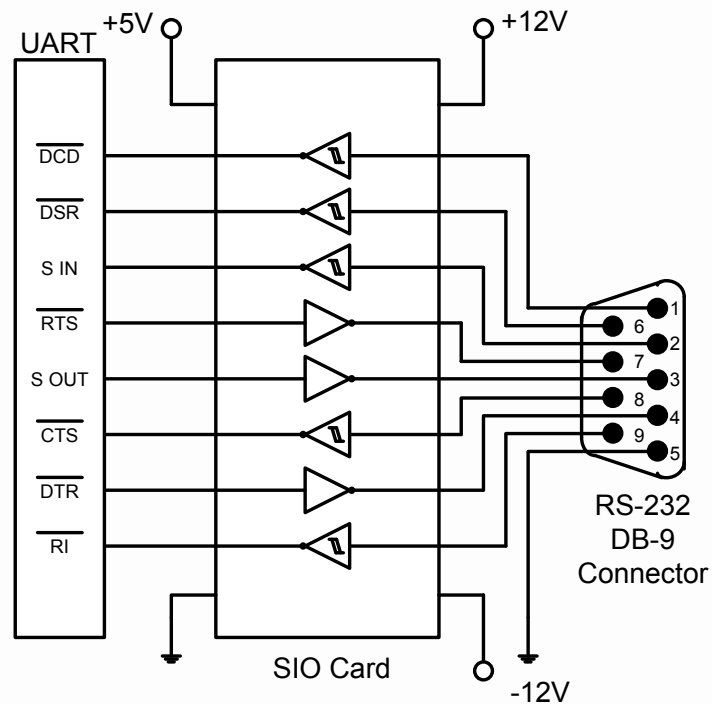
Receiver Section

Symbol	Parameter	Test Conditions	Min	Max	Unit
V_{T+}	Positive-Going Threshold Voltage		1.75	2.25	V
V_{T-}	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, $I_{OL} = -0.5\text{ mA}$	2.6	5	
V_{OL}	Low Level Output Voltage	$V_I = 3V, I_{OL} = 10\text{ mA}$	-	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

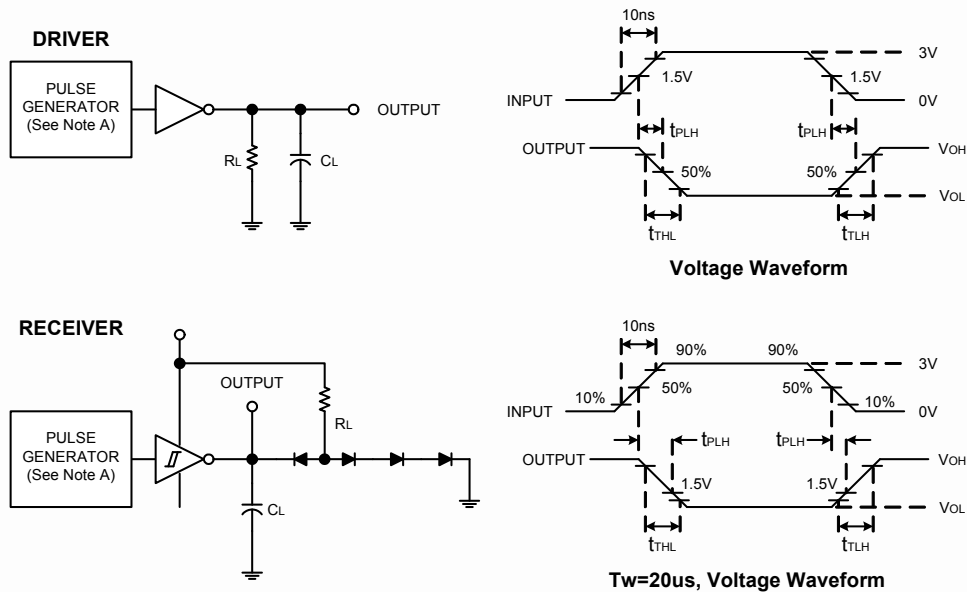
Receiver Switching Characteristic ($V_{CC} = 5V$)

Symbol	Parameter	Test Conditions	Min	Max	Unit
T_{PLH}	Propagation Delay Time, Low-To-High-Level Output	$C_L = 15\text{ pF}$ $R_L = 3.9\text{ k}\Omega$	-	150	ns
T_{PHL}	Propagation Delay Time, High -To- Low -Level Output	$C_L = 15\text{ pF}$ $R_L = 390\text{ k}\Omega$	-	50	ns
T_{TLH}	Transition Time, Low-To-High-Level Output	$C_L = 15\text{ pF}$ $R_L = 3.9\text{ k}\Omega$	-	175	ns
T_{THL}	Transition Time, High -To- Low -Level Output	$C_L = 15\text{ pF}$ $R_L = 390\text{ k}\Omega$	-	20	ns

Typical Applications



Typical Performance Characteristics

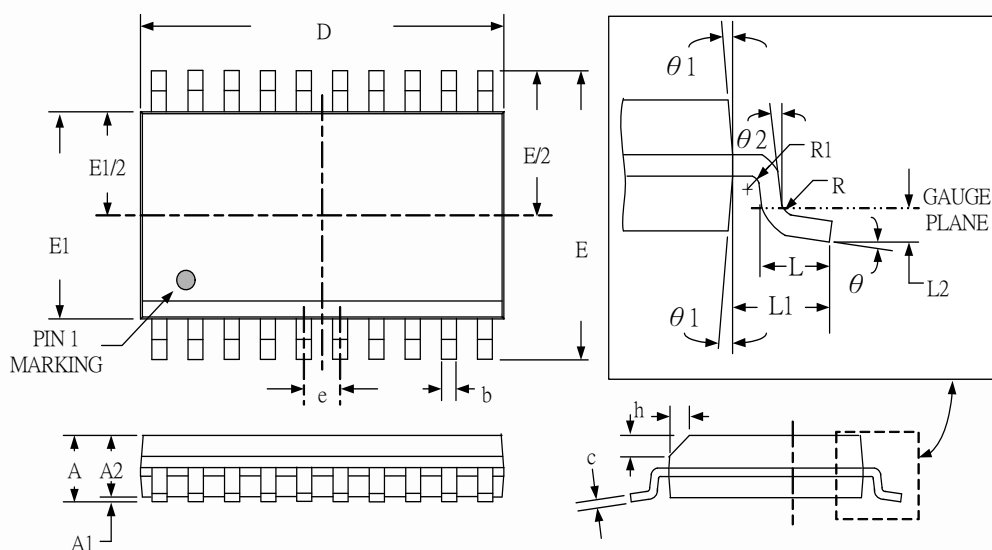


- Note:
- A. The pulse generator has the following characteristics. $f = 200 \text{ KHz}$, $Z_o = 50 \Omega$
 - B. C included probe and jig capacitance.
 - C. All diodes are 1N3064 or equivalent.

Fig1. Propagation and Transition Times

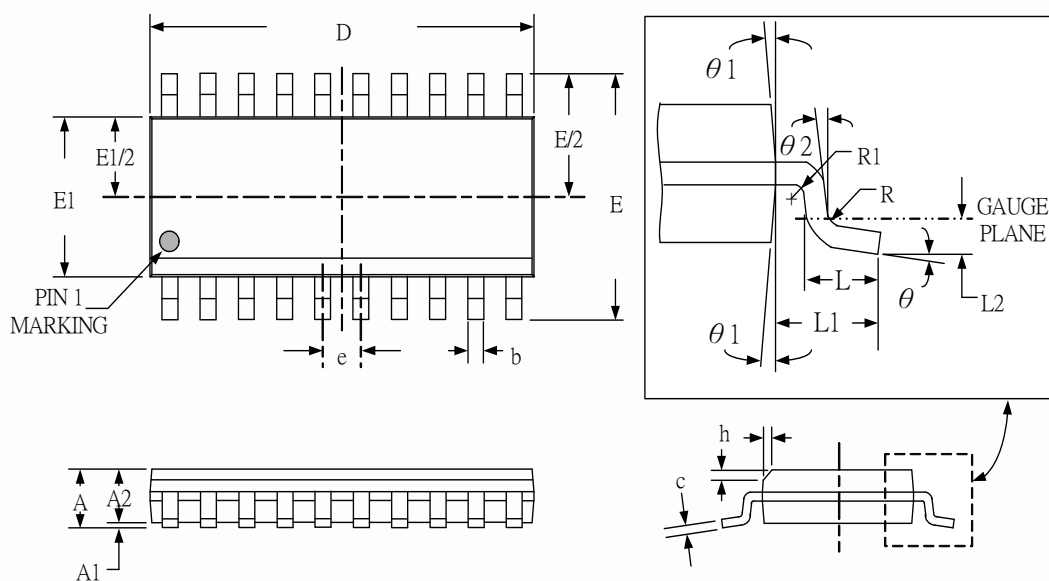
Package Dimension

SOIC-20



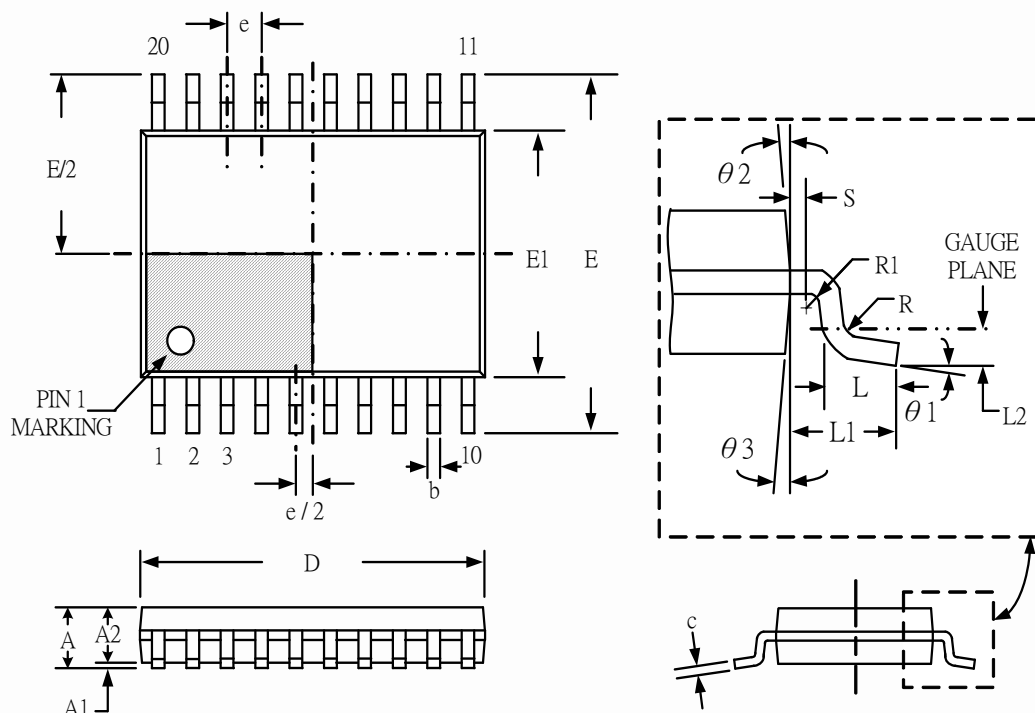
Dimensions			
SYMBOL	Millimeters		
	MIN	TYP	MAX
A	2.35	-	2.65
A1	0.10	-	0.30
A2	2.05	-	2.55
b	0.31	-	0.51
b1	0.27	-	0.48
c	0.20	-	0.33
D	-	12.80	-
E	-	10.30	-
E1	-	7.50	-
e	-	1.27	-
L	0.40	-	1.27
L1	-	1.40	-
L2	-	0.25	-
R	0.07	-	-
R1	0.07	-	-
h	0.25	-	0.75
θ	0°	-	8°
θ_1	5°	-	15°
θ_2	0°	-	-

SSOP-20



Dimensions				
SYMBOL	Millimeters		Inches	
	MIN	MAX	MIN	MAX
A	1.35	1.85	0.052	0.072
A1	0.05	0.25	0.001	0.009
A2	1.40	1.60	0.054	0.062
b	0.29	0.37	0.011	0.014
c	0.15	0.20	0.005	0.007
D	7.00	7.40	0.274	0.290
E	7.60	8.00	0.298	0.314
E1	5.10	5.50	0.200	0.215
e	0.65		0.025	
L	0.75	1.05	0.029	0.041
L1	1.25 (TYP)		0.049 (TYP)	
L2	0.25 (TYP)		0.009 (TYP)	
R	0.07	-	0.002	-
R1	0.07	-	0.002	-
h	0.25	0.50	0.009	0.019
θ	0°	8°	0°	8°
$\theta1$	5°	15°	5°	15°
$\theta2$	0°	-	0°	-

TSSOP-20



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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