

SN65C3238E, SN75C3238E 3-V TO 5.5-V MULTICHANNEL RS-232 LINE DRIVERS/RECEIVERS WITH ± 15 -kV ESD (HBM) PROTECTION

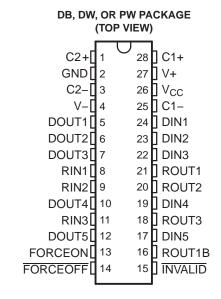
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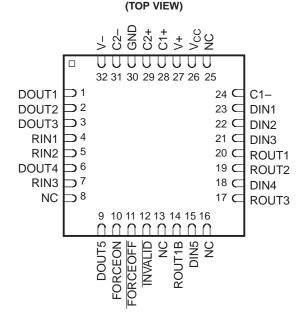
FEATURES

- RS-232 Bus-Pin ESD Protection Exceeds ±15 kV Using Human-Body Model (HBM)
- Meet or Exceed the Requirements of TIA/EIA-232-F and ITU v.28 Standards
- Operate With 3-V to 5.5-V V_{CC} Supply
- Operate up to 1000 kbit/s
- Five Drivers and Three Receivers
- Auto-Powerdown Plus Feature Enables Flexible Power-Down Mode
- Low Standby Current . . . 1 μA Typical
- External Capacitors . . . 4 × 0.1 μF
- Accept 5-V Logic Input With 3.3-V Supply
- Always-Active Noninverting Receiver Output (ROUT1B)
- ESD Protection for RS-232 Interface Pins
 - ±15 kV Human-Body Model (HBM)
 - ±8 kV IEC61000-4-2, Contact Discharge
 - ±15 kV IEC61000-4-2, Air-Gap Discharge

APPLICATIONS

- Battery-Powered Systems
- PDAs
- Notebooks
- Subnotebooks
- Laptops
- Palmtop PCs
- Hand-Held Equipment
- Modems
- Printers





RHB PACKAGE

DESCRIPTION/ORDERING INFORMATION

The SN65C3238E and SN75C3238E consist of five line drivers, three line receivers, and a dual charge-pump circuit with ±15-kV ESD (HBM) protection on the driver output (DOUT) and receiver input (RIN) terminals. The devices meet the requirements of TIA/EIA-232-F and provide the electrical interface between notebook and subnotebook computer applications. The charge pump and four small external capacitors allow operation from a single 3-V to 5.5-V supply. In addition, the devices include an always-active noninverting output (ROUT1B), which allows applications using the ring indicator to transmit data while the device is powered down. These devices operate at data signaling rates up to 1000 kbit/s.



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DESCRIPTION/ORDERING INFORMATION (CONTINUED)

Flexible control options for power management are featured when the serial port and driver inputs are inactive. The auto-powerdown plus feature functions when FORCEON is low and $\overline{FORCEOFF}$ is high. During this mode of operation, if the devices do not sense valid signal transitions on all receiver and driver inputs for approximately 30 s, the built-in charge pump and drivers are powered down, reducing the supply current to 1 μ A. By disconnecting the serial port or placing the peripheral drivers off, auto-powerdown plus occurs if there is no activity in the logic levels for the driver inputs. Auto-powerdown plus can be disabled when FORCEON and $\overline{FORCEOFF}$ are high. With auto-powerdown plus enabled, the devices activate automatically when a valid signal is applied to any receiver or driver input. $\overline{INVALID}$ is high (valid data) if any receiver input voltage is greater than 2.7 V or less than -2.7 V, or has been between -0.3 V and 0.3 V for less than 30 μ s. Refer to Figure 5 for receiver input levels.

ORDERING INFORMATION

T _A	PACKA	GE ⁽¹⁾	ORDERABLE PART NUMBER	TOP-SIDE MARKING
	SSOP – DB	Tube of 50	SN75C3238EDB	75022205
	220b – DB	Reel of 2000	SN75C3238EDB T5C3238E T5C32	7503230E
	TSSOP – PW	Tube of 50	SN75C3238EPW	Broviou
0°C to 70°C	1330P – PW	Reel of 2000	SN75C3238EPWR	Preview
	SOIC - DW	Tube of 50	SN75C3238EDW	75C3238E Preview 65C3238E
	SOIC - DW	Reel of 2000 SN75C3238EDWR 75C32 Reel of 2000 SN75C3238ECRHBR Previe	7503230E	
	QFN – RHB	Reel of 2000 SN75C3238ECRHBR		Preview
	SSOP – DB	Tube of 50	SN65C3238EDB	65C2220E
	220b – DB	Reel of 2000	SN65C3238EDBR	00U3Z30E
	TCCOD DW	Tube of 50	SN65C3238EPW	Descious
-40°C to 85°C	TSSOP – PW	Reel of 2000	SN65C3238EPWR	Preview
	COIC DW	Tube of 50	SN65C3238EDW	65C2220E
	SOIC – DW	Reel of 2000	SN65C3238EDWR	0003230E
	QFN – RHB	Reel of 2000	SN65C3238EIRHBR	Preview

⁽¹⁾ Package drawings, standard packing quantities, thermal data, symbolization, and PCB design guidelines are available at www.ti.com/sc/package.

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FUNCTION TABLES

Each Driver(1)

		INPUTS		OUTPUT	
DIN	FORCEON	FORCEOFF	TIME ELAPSED SINCE LAST RIN OR DIN TRANSITION	DOUT	DRIVER STATUS
Х	Χ	L	X	Z	Powered off
L	Н	Н	X	Н	Normal operation with
Н	Н	Н	X	L	auto-powerdown plus disabled
L	L	Н	<30 s	Н	Normal operation with
Н	L	Н	<30 s	L	auto-powerdown plus enabled
L	L	Н	>30 s	Z	Powered off by
Н	L	Н	>30 s	Z	auto-powerdown plus feature

⁽¹⁾ H = high level, L = low level, X = irrelevant, Z = high impedance

Each Receiver⁽¹⁾

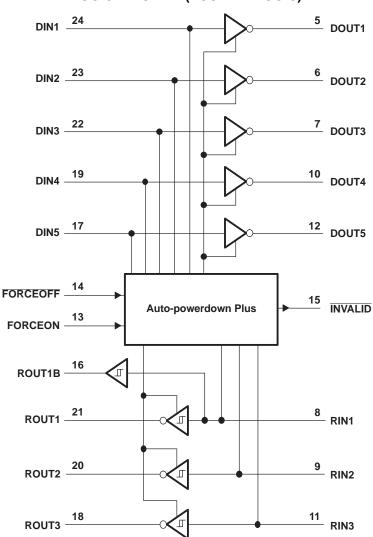
		INPUTS		OUT	PUTS	
L X H X L L L H	RIN2-RIN3	FORCEOFF	TIME ELAPSED SINCE LAST RIN OR DIN TRANSITION	ROUT1B	ROUT2 AND ROUT3	RECEIVER STATUS
L	Х	L	X	L	Z	Powered off while
Н	X	L	X	Н	Z	ROUT1B is active
L	L	Н	<30 s	L	Н	
L	Н	Н	<30 s	L	L	Normal operation with
Н	L	Н	<30 s	Н	Н	auto-powerdown plus
Н	Н	Н	<30 s	Н	L	disabled/enabled
Open	Open	Н	<30 s	L	Н	

⁽¹⁾ H = high level, L = low level, X = irrelevant, Z = high impedance (off), Open = input disconnected or connected driver off

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LOGIC DIAGRAM (POSITIVE LOGIC)





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Absolute Maximum Ratings (1)

over operating free-air temperature range (unless otherwise noted)

			MIN	MAX	UNIT
V _{CC}	Supply voltage range ⁽²⁾		-0.3	6	V
V+	Positive-output supply voltage range ⁽²⁾		-0.3	7	V
V-	Negative-output supply voltage range ⁽²⁾		0.3	-7	V
V+ - V-	Supply voltage difference ⁽²⁾			13	V
V	Innuit valtage ronge	Driver (FORCEOFF, FORCEON)	-0.3	6	V
V _I	Input voltage range	Receiver	-25	25	V
V	Output valtage range	Driver	-13.2	13.2	V
Vo	Output voltage range	Receiver (INVALID)	-0.3	$V_{CC} + 0.3$	V
		DB package		62	
0	Package thermal impedance (3)(4)	DW package		46	°C/W
θ_{JA}	Package thermal impedance (A)	PW package		62	-C/VV
		RHB package		TBD	
T _J	Operating virtual junction temperature			150	°C
T _{stg}	Storage temperature range		-65	150	°C

- (1) Stresses beyond 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 beyond those indicated under "recommended operating conditions" is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.
- All voltages are with respect to network GND.
- Maximum power dissipation is a function of $T_{II}(max)$, θ_{IA} , and T_{A} . The maximum allowable power dissipation at any allowable ambient temperature is $P_D = (T_J(max) - T_A)/\theta_{JA}$. Operating at the absolute maximum T_J of 150°C can affect reliability.
- The package thermal impedance is calculated in accordance with JESD 51-7.

Recommended Operating Conditions⁽¹⁾

See Figure 6

				MIN	NOM	MAX	UNIT
	Supply voltage		$V_{CC} = 3.3 \text{ V}$	3	3.3	3.6	V
	Supply voltage		$V_{CC} = 5 V$	4.5	5	5.5	V
\/	Driver and central high level input valtage		V _{CC} = 3.3 V	2		5.5	V
V_{IH}	Driver and control high-level input voltage		V _{CC} = 5 V	2.4		5.5	V
V_{IL}	Driver and control low-level input voltage	DIN, FORCEOFF, FORCE	EON	0		0.8	V
V_{I}	Receiver input voltage			-25		25	V
т	Operating free air temperature		SN75C3238E	0		70	°C
IA	Operating free-air temperature		SN65C3238E	-40		85	

⁽¹⁾ Testing supply conditions are C1–C4 = 0.1 μ F at V_{CC} = 3.3 V \pm 0.15 V; C1–C4 = 0.22 μ F at V_{CC} = 3.3 V \pm 0.3 V; and C1 = 0.047 μ F and C2–C4 = 0.33 μ F at V_{CC} = 5 V \pm 0.5 V.

Electrical Characteristics⁽¹⁾

over recommended ranges of supply voltage and operating free-air temperature (unless otherwise noted) (see Figure 6)

	PARA	METER	TEST CONDITIONS	MIN	TYP ⁽²⁾	MAX	UNIT
I _I	Input leakage current	FORCEOFF, FORCEON			±0.01	±1	μΑ
		Auto-powerdown plus disabled	No load, FORCEOFF and FORCEON at V _{CC}		0.5	2	mA
I _{CC}	Supply current	Powered off	No load, FORCEOFF at GND		1	10	
	(T _A = 25°C)	Auto-powerdown plus enabled	No load, FORCEOFF at V _{CC} , FORCEON at GND, All RIN are open or grounded		1	10	μΑ

- Testing supply conditions are C1–C4 = 0.1 μ F at V_{CC} = 3.3 V \pm 0.15 V; C1–C4 = 0.22 μ F at V_{CC} = 3.3 V \pm 0.3 V; and C1 = 0.047 μ F and C2–C4 = 0.33 μ F at V_{CC} = 5 V ± 0.5 V. All typical values are at V_{CC} = 3.3 V or V_{CC} = 5 V, and T_A = 25°C.

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DRIVER SECTION

Electrical Characteristics(1)

over recommended ranges of supply voltage and operating free-air temperature (unless otherwise noted) (see Figure 6)

	PARAMETER	TE	ST CONDITIONS	3	MIN	TYP ⁽²⁾	MAX	UNIT
V_{OH}	High-level output voltage	All DOUT at $R_L = 3 \text{ k}\Omega$ to	GND		5	5.4		V
V_{OL}	Low-level output voltage	All DOUT at $R_L = 3 \text{ k}\Omega$ to	GND		-5	-5.4		٧
I _{IH}	High-level input current	$V_I = V_{CC}$				±0.01	±1	μΑ
I _{IL}	Low-level input current	V _I at GND				±0.01	±1	μΑ
	Short-circuit output current ⁽³⁾	$V_{CC} = 3.6 \text{ V},$	$V_O = 0 V$			±35	±60	mΑ
Ios	Short-circuit output current	$V_{CC} = 5.5 V,$	$V_O = 0 V$			±40	±100	IIIA
r _o	Output resistance	V_{CC} , V+, and V- = 0 V,	$V_O = \pm 2 V$		300	10M		Ω
	Output lookaga aurront	FORCEOFF = GND	$V_0 = \pm 12 \text{ V},$	V_{CC} = 3 V to 3.6 V			±25	^
I _{OZ}	Output leakage current	FUNCEUFF = GND	$V_{O} = \pm 10 \text{ V},$	V _{CC} = 4.5 V to 5.5 V			±25	μΑ

⁽¹⁾ Testing supply conditions are C1–C4 = 0.1 μ F at V_{CC} = 3.3 V \pm 0.15 V; C1–C4 = 0.22 μ F at V_{CC} = 3.3 V \pm 0.3 V; and C1 = 0.047 μ F and C2–C4 = 0.33 μ F at V_{CC} = 5 V \pm 0.5 V.

Switching Characteristics⁽¹⁾

over recommended ranges of supply voltage and operating free-air temperature (unless otherwise noted) (see Figure 6)

	PARAMETER		TEST CONDITIONS		MIN	TYP ⁽²⁾ MA	X UNIT
			C _L = 1000 pF		250		
	Maximum data rate (see Figure 1)	$R_L = 3 \text{ k}\Omega$, One DOUT switching	$C_L = 250 \text{ pF},$	V _{CC} = 3 V to 4.5 V	1000		kbit/s
	(See Figure 1)	One Boot switching	C _L = 1000 pF,	V _{CC} = 4.5 V to 5.5 V	1000		
t _{sk(p)}	Pulse skew ⁽³⁾	$C_L = 150 \text{ pF to } 2500 \text{ pF},$	$R_L = 3 \text{ k}\Omega \text{ to } 7 \text{ k}\Omega,$	See Figure 2		25	ns
SR(tr)	Slew rate, transition region (see Figure 1)	C _L = 150 pF to 1000 pF,	$R_L = 3 \text{ k}\Omega \text{ to } 7 \text{ k}\Omega,$	V _{CC} = 3.3 V	18	15	0 V/μs

⁽¹⁾ Testing supply conditions are C1–C4 = 0.1 μ F at V_{CC} = 3.3 V \pm 0.15 V; C1–C4 = 0.22 μ F at V_{CC} = 3.3 V \pm 0.3 V; and C1 = 0.047 μ F and C2–C4 = 0.33 μ F at V_{CC} = 5 V \pm 0.5 V.

ESD Protection

PARAMETER	TEST CONDITIONS	TYP	UNIT
	НВМ	±15	
DOUT	IEC 61000-4-2, Air-Gap Discharge	±15	kV
	IEC 61000-4-2, Contact Discharge	±8	

⁽²⁾ All typical values are at $V_{CC} = 3.3 \text{ V}$ or $V_{CC} = 5 \text{ V}$, and $T_A = 25^{\circ}\text{C}$.

⁽³⁾ Short-circuit durations should be controlled to prevent exceeding the device absolute power dissipation ratings, and not more than one output should be shorted at a time.

⁽²⁾ All typical values are at $V_{CC} = 3.3 \text{ V}$ or $V_{CC} = 5 \text{ V}$, and $T_A = 25^{\circ}\text{C}$.

⁽³⁾ Pulse skew is defined as $|t_{PLH} - t_{PHL}|$ of each channel of the same device.



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RECEIVER SECTION

Electrical Characteristics(1)

over recommended ranges of supply voltage and operating free-air temperature (unless otherwise noted) (see Figure 6)

	PARAMETER	TEST CONDITIONS	MIN	TYP ⁽²⁾	MAX	UNIT
V_{OH}	High-level output voltage	$I_{OH} = -1 \text{ mA}$	V _{CC} - 0.6	V _{CC} – 0.1		V
V_{OL}	Low-level output voltage	$I_{OL} = 1.6 \text{ mA}$			0.4	V
\/	Positive-going input threshold voltage	$V_{CC} = 3.3 \text{ V}$		1.5	2.4	V
V _{IT+}	Positive-going input tilleshold voltage	$V_{CC} = 5 V$		1.8	2.4	V
1/	Negative going input threshold voltage	$V_{CC} = 3.3 \text{ V}$	0.6	1.2		V
V _{IT}	Negative-going input threshold voltage	$V_{CC} = 5 V$	0.8	1.5		V
V_{hys}	Input hysteresis (V _{IT+} - V _{IT-})			0.3		V
I_{OZ}	Output leakage current (except ROUT1B)	FORCEOFF = 0 V		±0.05	±10	μΑ
r _i	Input resistance	$V_1 = \pm 3 \text{ V to } \pm 25 \text{ V}$	3	5	7	kΩ

⁽¹⁾ Testing supply conditions are C1–C4 = 0.1 μ F at V_{CC} = 3.3 V \pm 0.15 V; C1–C4 = 0.22 μ F at V_{CC} = 3.3 V \pm 0.3 V; and C1 = 0.047 μ F and C2–C4 = 0.33 μ F at V_{CC} = 5 V \pm 0.5 V. (2) All typical values are at V_{CC} = 3.3 V or V_{CC} = 5 V, and T_A = 25°C.

Switching Characteristics⁽¹⁾

over recommended ranges of supply voltage and operating free-air temperature (unless otherwise noted)

	PARAMETER	TEST CONDITIONS	TYP ⁽²⁾	UNIT
t _{PLH}	Propagation delay time, low- to high-level output	C _L = 150 pF, See Figure 3	150	ns
t _{PHL}	Propagation delay time, high- to low-level output	C _L = 150 pF, See Figure 3	150	ns
t _{en}	Output enable time	$C_L = 150 \text{ pF}, R_L = 3 \text{ k}\Omega, \text{ See Figure 4}$	200	ns
t _{dis}	Output disable time	$C_L = 150 \text{ pF}, R_L = 3 \text{ k}\Omega, \text{ See Figure 4}$	200	ns
t _{sk(p)}	Pulse skew ⁽³⁾	See Figure 3	50	ns

Testing supply conditions are C1–C4 = 0.1 μ F at V_{CC} = 3.3 V \pm 0.15 V; C1–C4 = 0.22 μ F at V_{CC} = 3.3 V \pm 0.3 V; and C1 = 0.047 μ F and C2–C4 = 0.33 μF at V_{CC} = 5 V \pm 0.5 V.

- (2) All typical values are at V_{CC} = 3.3 V or V_{CC} = 5 V, and T_A = 25°C.
 (3) Pulse skew is defined as |t_{PLH} t_{PHL}| of each channel of the same device.

ESD Protection

PARAMETER	TEST CONDITIONS	TYP	UNIT
	НВМ	±15	
RIN	IEC 61000-4-2, Air-Gap Discharge	±15	kV
	IEC 61000-4-2, Contact Discharge	±8	



AUTO-POWERDOWN PLUS SECTION

Electrical Characteristics

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over recommended ranges of supply voltage and operating free-air temperature (unless otherwise noted) (see Figure 5)

	PARAMETER	TEST CONDITIONS	MIN	MAX	UNIT
V _{T+(valid)}	Receiver input threshold for INVALID high-level output voltage	FORCEON = GND, FORCEOFF = V _{CC}		2.7	V
V _{T-(valid)}	Receiver input threshold for INVALID high-level output voltage	FORCEON = GND, FORCEOFF = V _{CC}	-2.7		V
V _{T(invalid)}	Receiver input threshold for INVALID low-level output voltage	FORCEON = GND, FORCEOFF = V _{CC}	-0.3	0.3	V
V _{OH}	INVALID high-level output voltage	I _{OH} = -1 mA, FORCEON = GND, FORCEOFF = V _{CC}	V _{CC} - 0.6		V
V _{OL}	INVALID low-level output voltage	I _{OL} = 1.6 mA, FORCEON = GND, FORCEOFF = V _{CC}		0.4	V

Switching Characteristics

over recommended ranges of supply voltage and operating free-air temperature (unless otherwise noted) (see Figure 5)

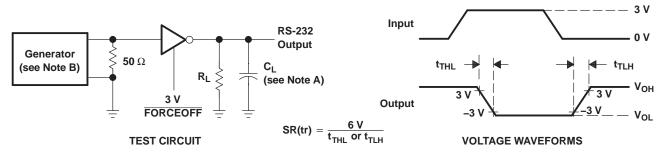
	PARAMETER	MIN	TYP ⁽¹⁾	MAX	UNIT
t _{valid}	Propagation delay time, low- to high-level output		0.1		μs
t _{invalid}	Propagation delay time, high- to low-level output		50		μs
t _{en}	Supply enable time		25		μs
t _{dis}	Receiver or driver edge to auto-powerdown plus	15	30	60	S

(1) All typical values are at V_{CC} = 3.3 V or V_{CC} = 5 V, and T_A = 25°C.



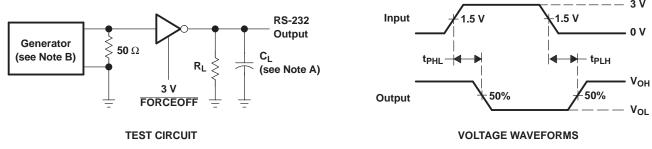
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PARAMETER MEASUREMENT INFORMATION



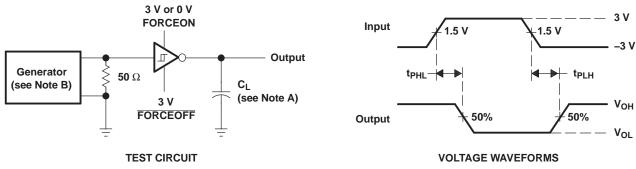
- A. C_L includes probe and jig capacitance.
- B. The pulse generator has the following characteristics: PRR = 250 kbit/s, $Z_O = 50 \Omega$, 50% duty cycle, $t_r \le 10$ ns, $t_f \le 10$ ns.

Figure 1. Driver Slew Rate



- A. C_L includes probe and jig capacitance.
- B. The pulse generator has the following characteristics: PRR = 250 kbit/s, $Z_O = 50 \Omega$, 50% duty cycle, $t_r \le 10$ ns, $t_f \le 10$ ns.

Figure 2. Driver Pulse Skew



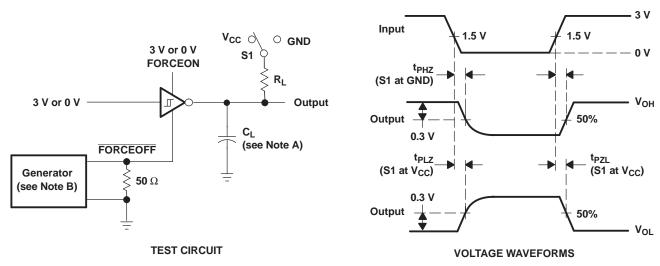
- A. C_I includes probe and jig capacitance.
- B. The pulse generator has the following characteristics: Z_0 = 50 Ω , 50% duty cycle, $t_r \le 10$ ns, $t_f \le 10$ ns.

Figure 3. Receiver Propagation Delay Times

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PARAMETER MEASUREMENT INFORMATION (continued)

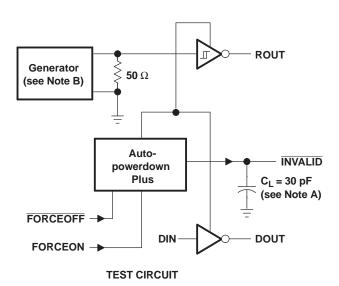


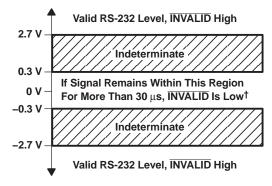
- A. C_L includes probe and jig capacitance.
- B. The pulse generator has the following characteristics: $Z_0 = 50 \ \Omega$, 50% duty cycle, $t_r \le 10 \ ns$, $t_f \le 10 \ ns$.
- C. t_{PLZ} and t_{PHZ} are the same as t_{dis} .
- D. t_{PZL} and t_{PZH} are the same as t_{en} .

Figure 4. Receiver Enable and Disable Times



PARAMETER MEASUREMENT INFORMATION (continued)





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† Auto-powerdown plus disables drivers and reduces supply current to 1 μA.

- NOTES: A. C_L includes probe and jig capacitance.
 - B. The pulse generator has the following characteristics: PRR = 5 kbit/s, Z_O = 50 Ω , 50% duty cycle, $t_r \le 10$ ns, $t_f \le 10$ ns.

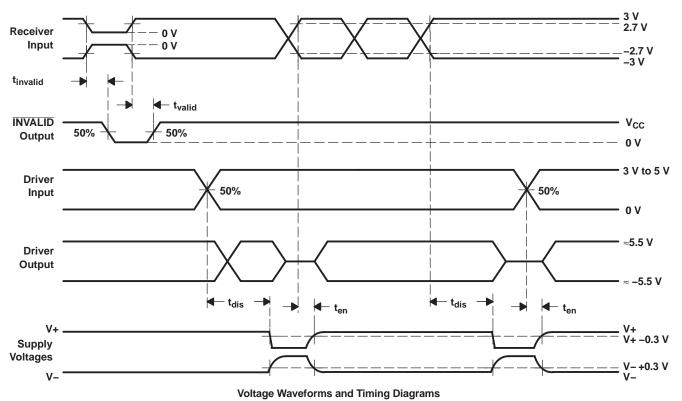
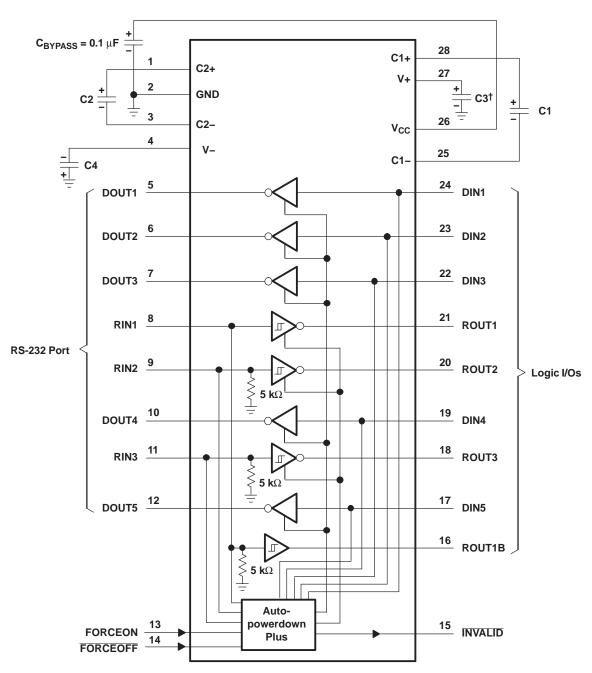


Figure 5. INVALID Propagation-Delay Times and Supply-Enabling Time

APPLICATION INFORMATION



V_{CC} vs CAPACITOR VALUES

 † C3 can be connected to V_{CC} or GND.

NOTES: A. Resistor values shown are nominal.

B. Nonpolarized ceramic capacitors are acceptable. If polarized tantalum or electrolytic capacitors are used, they should be connected as shown

V _{CC}	C1	C2, C3, and C4
$\begin{array}{c} 3.3 \text{ V} \pm 0.15 \text{ V} \\ 3.3 \text{ V} \pm 0.3 \text{ V} \\ 5 \text{ V} \pm 0.5 \text{ V} \\ 3 \text{ V to } 5.5 \text{ V} \end{array}$	0.1 μF 0.22 μF 0.047 μF 0.22 μF	0.1 μF 0.22 μF 0.33 μF 1 μF

Figure 6. Typical Operating Circuit and Capacitor Values



TAPE AND REEL INFORMATION





	Dimension designed to accommodate the component width
B0	Dimension designed to accommodate the component length
K0	Dimension designed to accommodate the component thickness
W	Overall width of the carrier tape
P1	Pitch between successive cavity centers

QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE



*All dimensions are nominal

Device	Package Type	Package Drawing		SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
SN65C3238EDBR	SSOP	DB	28	2000	330.0	16.4	8.2	10.5	2.5	12.0	16.0	Q1
SN65C3238EDWR	SOIC	DW	28	1000	330.0	32.4	11.35	18.67	3.1	16.0	32.0	Q1
SN75C3238EDBR	SSOP	DB	28	2000	330.0	16.4	8.2	10.5	2.5	12.0	16.0	Q1
SN75C3238EDWR	SOIC	DW	28	1000	330.0	32.4	11.35	18.67	3.1	16.0	32.0	Q1





*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
SN65C3238EDBR	SSOP	DB	28	2000	346.0	346.0	33.0
SN65C3238EDWR	SOIC	DW	28	1000	346.0	346.0	49.0
SN75C3238EDBR	SSOP	DB	28	2000	346.0	346.0	33.0
SN75C3238EDWR	SOIC	DW	28	1000	346.0	346.0	49.0

DW (R-PDSO-G28)

PLASTIC SMALL OUTLINE



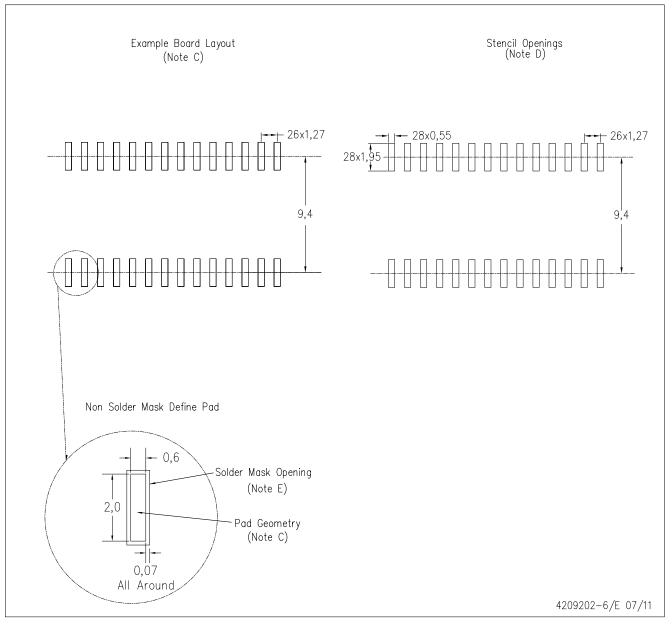
NOTES: A. All linear dimensions are in inches (millimeters). Dimensioning and tolerancing per ASME Y14.5M-1994.

- B. This drawing is subject to change without notice.
- C. Body dimensions do not include mold flash or protrusion not to exceed 0.006 (0,15).
- D. Falls within JEDEC MS-013 variation AE.



DW (R-PDSO-G28)

PLASTIC SMALL OUTLINE



NOTES:

- A. All linear dimensions are in millimeters.
- B. This drawing is subject to change without notice.
- C. Refer to IPC7351 for alternate board design.
- D. Laser cutting apertures with trapezoidal walls and also rounding corners will offer better paste release. Customers should contact their board assembly site for stencil design recommendations. Refer to IPC-7525
- E. Customers should contact their board fabrication site for solder mask tolerances between and around signal pads.



DB (R-PDSO-G**)

PLASTIC SMALL-OUTLINE

28 PINS SHOWN



NOTES: A. All linear dimensions are in millimeters.

B. This drawing is subject to change without notice.

C. Body dimensions do not include mold flash or protrusion not to exceed 0,15.

D. Falls within JEDEC MO-150

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