RS-232: IEC ESD-Protected Devices From TI

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Texas Instruments (TI) offers new RS-232 devices with systemlevel IEC61000-4-2 electrostatic discharge (ESD) protection. This protection makes the RS-232 interface immune to damage from ESD strikes that may occur while the system is up and running, such as when a connection to the RS-232 cable is made. These devices are drop-in replacements and are functionally identical to the existing industry-standard solutions, providing a seamless transition in the qualification process. These devices meet the requirements for low-power, high-speed applications such as portable/consumer, telecom and computing equipment.

TI offers these new devices in the NiPdAu Pb-Free finish, which eliminates tin whiskers that might compromise long-term system reliability. TI offers the space-saving QFN package on select devices in addition to its already extensive RS-232 portfolio.

Applications

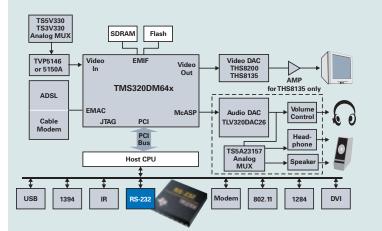
The three-driver, five-receiver TRS3243E is used in most popular applications like PCs, notebooks and servers. The TRS3238E/37E offer complementary five-driver, three-receiver solutions. These two devices are popular in PC peripheral applications like data cables. printers, modems, industrial control, etc. The TRS3227E/23E/22E/21E are popular in portable handheld applications due to their reduced bit

Personal Video Recorder Application Block Diagram

Features and Benefits

- No external ESD device needed with these system-level ESD ratings:
 - ±15-kV human-body model (HBM)
 - ±8-kV IEC61000-4-2, contact discharge
 - ±15-kV IEC61000-4-2, air-gap discharge
- Improved drop-in replacement of popular RS-232 devices
- Data rates meet or exceed today's high-speed-application requirements
- Flexible power-saving options enable longer battery life
- Wide portfolio permits selection of the right form, fit and functionality
- Industry-leading interface product space with assured source of supply
- NiPdAu Pb-Free solution provides whisker-free, reliable package options
- Space-saving QFN package options for portable applications

count, package size and lower power consumption. TI offers higherspeed versions like the TRSF3232E/23E/22E/21E to meet today's higher throughput needs through the serial interface. The TRS232E and TRS213 provide a higher noise margin for more rugged environments such as industrial control.



PDA Interface Application Block Diagram RS-232 SDRAM FLASH CPU OFDM QAM QPSK DEMOI 0 Smart Card MMC SD 803.11 ()<u>R</u> CODEC Video P DVI/TMDS SDRAM FLASH TV CH3-4 MOD 1394 PHY LAN Port EM EMA

Technology for Innovators





TI RS-232 IEC ESD-Protected Devices

	Supply					ESD Ratings			
	Voltage				Speed	Contact	Air Gap	HBM	
Device	(V)	Drivers	Receivers	Shutdown	(kbps)	(kV)	(kV)	(kV)	Common Applications
TRS3243E	+3 to +5	3	5	Auto	500	8	15	15	PC, Notebook, Server, Modem
TRS3222E	+3 to +5	2	2	Manual	500	8	15	15	Portables, Video Recorder, IP Phone
TRS3221E	+3 to +5	1	1	Auto	250	8	15	15	PDA, IP Phone, Palmtop Computer
TRS3227	+3 to +5	1	1	Auto+	1000	8	8	15	Portables, PDA, Cell Phone
TRS3386E	+3 to $+5$ V _{CC}	3	2	Manual	250	8	15	15	Portables, Data Cable, Cell Phone, PDA
	Down to 1.8 $V_{\rm L}$								
TRS213	+5	4	5	Manual	120			15	Industrial Automation, TV
TRSF3221E	+3 to +5	1	1	Auto	1000	8	15	15	PDA, IP Phone, Palmtop Computer
TRS3223E	+3 to +5	2	2	Auto	500	8	15	15	PDA, Cell Phone, Portables
TRS3318	+2.25 to +3	2	2	Auto+	500	8	8	15	Handheld Equipment, Pager, Cell Phone
TRS3227E	+3 to +5	1	1	Auto	1000	8	15	15	PDA, Cell Phone, IP Phone
TRS3232E	+3 to +5	2	2	No	250	8	15	15	Set-Top Box, DVD Recorder, IP Phone
TRSF3232E	+3 to +5	2	2	No	1000	8	15	15	Set-Top Box, DVD Recorder, IP Phone
TRS3238E	+3 to +5	5	3	Auto+	400	8	15	15	Data Cable, Car Phone, Printer, Modem
TRSF3222E	+3 to +5	2	2	Manual	1000	8	15	15	Portables, Video Recorder, IP Phone
TRSF3223E	+3 to +5	2	2	Auto	1000	8	15	15	Portables, Video Recorder, IP Phone
TRS232E	+5	2	2	No	120	8	15	15	Industrial Control, Router, Modem
TRSF3238E	+3 to +5	5	3	Auto+	1000	8	15	15	Data Cable, Car Phone, Printer, Modem
TRS3237E	+3 to +5	5	3	Auto	1000	8	15	15	Cell Phone, Cable, Industrial Automation,
									Printer, Modem

5- x 5-mm, 32-pin QFN package (RHB)

(60% smaller than the TSSOP):

- TRS3243E: 3 drivers/5 receivers with auto power-down
- TRS3238E: 5 drivers/3 receivers with auto power-down plus
- TRS3237E: 5 drivers/3 receivers with speed select pin

5.5- x 3.5-mm, 24-pin QFN package (RHL)

(54% smaller than the TSSOP):

- TRS3222E: 2 drivers/2 receivers with manual power-down
- TRS3223E: 2 drivers/2 receivers with auto power-down



For More Information

For more information about TI's IEC ESD products and a complete listing of RS-232 solutions, visit:

www.ti.com/rs232

For other logic samples, datasheets, application reports and design summaries, visit:

logic.ti.com



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