

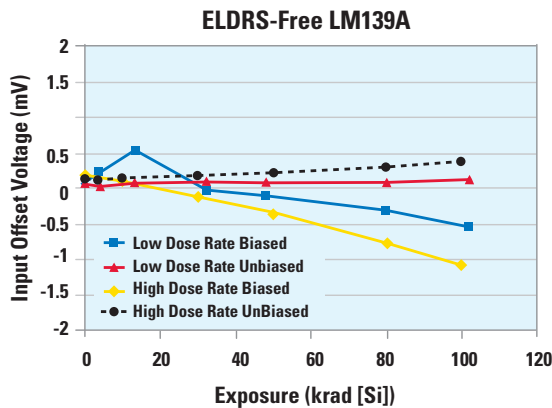
ELDRS-Free Bipolar Analog Products

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Enhanced Low Dose Rate Sensitivity

It has been shown that for many types of integrated circuits, the response to total ionizing dose (TID) radiation is dependent on the dose rate. Many bipolar products have been shown to exhibit

enhanced low dose rate sensitivity (ELDRS), where they may pass TID testing at high dose rates, but fail at lower dose rates. National Semiconductor's bipolar process technology delivers superior radiation performance and no ELDRS.



Every wafer is tested and qualified at high and low dose rates:

- Per Mil-Std-883 method 1019 condition D
- Low dose rate of 10 mrad/s (36 rad/hr)
- Biased and unbiased

SMD Ordering for ELDRS-Free Products

Example LM124A SMD ordering number

5 9 6 2 R 9 9 5 0 4 0 2 V x A

Level of radiation exposure

Low dose rate qualified

DSCC Unique Low Dose Rate Certified Products

Product ID	Description	TID Part Number	ELDRS Part Number
ELDRS-Free Products			
LM124AQML	Low-power, quad operational amplifier	5962R9950401VxA	5962R9950402VxA
LM139AQML	Low-power, low-offset voltage quad comparator	5962R9673801VxA	5962R9673802VxA
LM117QML	3-terminal adjustable regulator	5962R9951703VxA	5962R9951705VxA
LM136-2.5QML	2.5V reference diode	5962R0050101VxA	5962R0050102VxA
LM193QML	Low-power, low-offset voltage, dual comparator	5962R9452602VxA	5962R9452603VxA
LM111QML	Voltage comparator	5962L0052401VxA	5962R0052402VxA
LM158QML	Low-power, dual operational amplifier	5962R8771002VxA	5962R8771003VxA
LM119QML	High-speed, dual comparator	5962R9679801VxA	5962R9679802VxA
LM2941QML	1A, low-dropout adjustable regulator	5962R9166701VxA	5962R9166702VxA
LMP2012QML	Dual, high precision, rail-to-rail output op amp	5962L0620601VxA	5962L0620602VxA
LM7171QML	High-speed, high-output voltage feedback amp	5962F9553601VxA	5962F9553602VxA
Low-Dose Rate Qualified Products			
LM117HVQML	3-terminal adjustable regulator	5962R0722901VxA	5962R0722961VxA
LM4050QML	Precision micropower shunt voltage reference	—	5962R0923561VzA
Products in Qualification			
LM101AQML	Operational amplifier	5962L9951501VxA	5962L9951502VxA
LM113	1.2V reference diode	5962R9684302VxA	5962R9684303VxA
LM137	3-terminal adjustable negative regulator	5962P9951701VxA	5962L9951706VxA

x – Indicates multiple package options available

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