

ISL75054SLHMF

High Dose Rate Total Ionizing Dose Testing of the ISL75054SLHMF Ultra Low Noise LDO

Introduction

This report summarizes the results of High Dose Rate (HDR) total ionizing dose (TID) testing of the ISL75054SLHMF radiation hardened ultra-low noise low-dropout regulator (LDO). The test was conducted to provide an assessment of the total dose hardness of the part and to provide an estimate of the bias sensitivity. Parts were irradiated either under bias or with all pins grounded at a HDR (58.2rad(Si)/s) to 150krad(Si) followed by a 168-hour biased anneal at 100°C. The [ISL75054SLH](#) is rated to 75krad(Si) at low dose rate (10mrad(Si)/s) and is acceptance tested on a wafer-by-wafer basis to the datasheet limits. HDR data is provided for characterization only.

Product Description

The ISL75054SLH is a radiation hardened low dropout linear regulator with ultra-low noise, and high PSRR intended for ADC, RF, and other noise sensitive applications. The device has an operating supply voltage range of 2.7V to 30V and an output voltage range of 0.5V to $V_{IN} - V_{DO}$. The device supplies up to 1.0A of current at a typical 379mV dropout voltage. Built-in protection includes foldback, internal and externally programmable current limit, and over temperature protection. The ISL75054SLH features excellent noise performance and PSRR for radiation hardened LDOs, with ultra-low RMS noise of 4μVRMS from 10Hz to 100kHz and ultra-high PSRR of 101.5dB at 120Hz.

The ISL75054SLHMF is offered in a 10-pin ceramic flatpack package and operates across the full-range military temperature of -55°C to +125°C. The pin assignments for the ISL75054SLHMF are shown in [Figure 1](#) and the pin descriptions are shown in [Table 1](#).

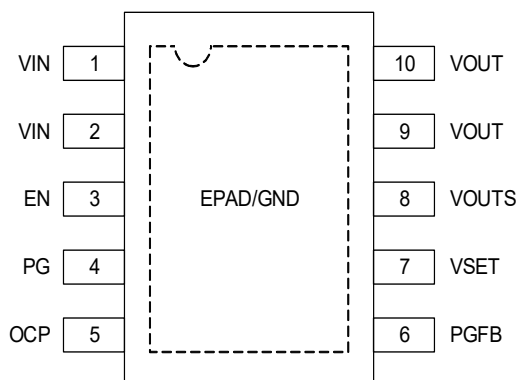


Figure 1. ISL75054SLHMF Pin Assignments

Table 1. ISL75054SLH Pin Descriptions

Pin Number	Pin Name	Description
1, 2	VIN	Input supply pins. V_{IN} range is from 2.7V to 30V. This pin requires sufficient input capacitance from VIN to GND, 30 μ F is recommended and should be placed close to the device pins.
3	EN	Enable pin. When set above 1.14V nominally, the device is enabled.
4	PG	Power-Good output. This output is open-drain logic, connect a pull-up resistor to a logic supply or V_{IN} . For SEE mitigation, connect a 150pF capacitor from PG to GND. PG stays low and fast start-up functionality is disabled by connecting PGFB to VIN.
5	OCP	Overcurrent protection. OCP allows the current limit to be programmed with an external resistor, R_{OCP} , between a typical range of 0.2A to 1.4A. Connect OCP directly to GND to set the maximum current limit. <i>Note:</i> The OCP pin sources a 530:1 ratio of the current out of VOUT.
6	PGFB	Power-good feedback. To enable fast start-up functionality and power-good detection, connect an external resistor divider from VOUT so that 665mV is provided to PGFB at the nominal output voltage. For SEE mitigation, connect a 470pF capacitor from VOUT to PGFB. Connect PGFB to VIN to disable fast start-up and PG functions when not required.
7	VSET	Voltage set. VSET sources a precision 100 μ A current that flows through the external R_{SET} resistor to GND. VSET sets the soft-start output voltage ramp rate through an external capacitor, C_{SET} , to GND. C_{SET} also provides filtering to internal device noise. Renesas recommends selecting C_{SET} between 0.47 μ F and 10 μ F.
8	VOUTS	Output voltage sense. VOUTS is the non-inverting input to the error amplifier. Connect VOUTS directly to the output capacitor.
9, 10	VOUT	Output voltage pins. A capacitance is required from VOUT to GND, 30 μ F is recommended. VOUT is set through a resistor from the VSET pin to GND and can range from 0.5V to $V_{IN} - V_{DO}$.
-	EPAD	Ground. The EPAD is the electrical connection to GND and is additionally used as a heatsink.

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1. Test Description

1.1 Irradiation Facility

HDR testing was performed on October 3, 2024 at 58.2rad(Si)/s using a Gammacell 220 irradiator located in the Palm Bay, Florida Renesas facility. A PbAl box was used to shield the test fixture and devices under test against low energy, secondary gamma radiation.

1.2 Test Fixturing

Figure 2 shows the configuration used for the biased HDR testing and the anneal.

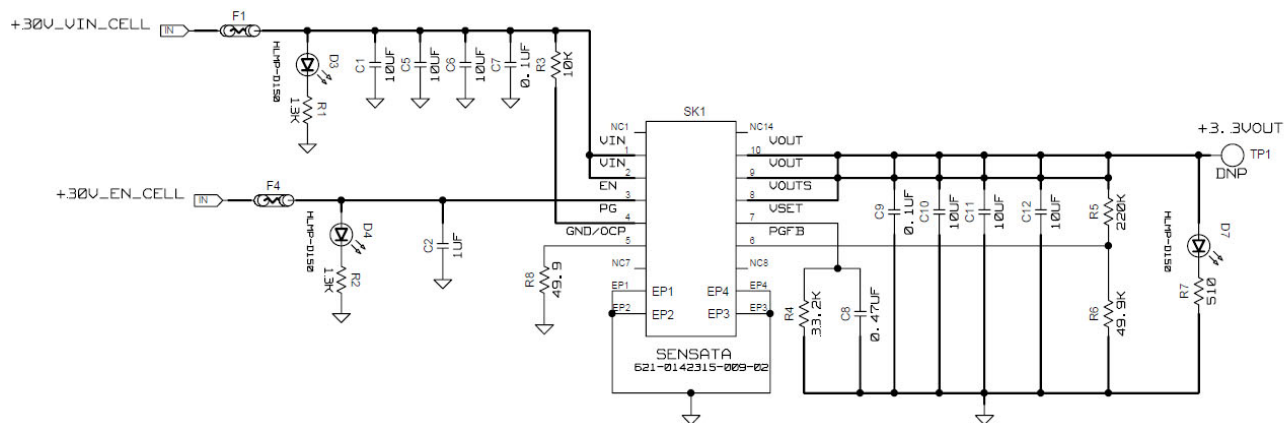


Figure 2. ISL75054SLH HDR Bias Configuration

1.3 Characterization Equipment and Procedures

All electrical testing was performed outside the irradiator using the production Automated Test Equipment (ATE) with data logging at each downpoint. Downpoint electrical testing was performed at room temperature.

1.4 Experimental Matrix

Irradiation was performed in accordance with the guidelines of MIL-STD-883 Test Method 1019. The experimental matrix consisted of eight samples irradiated at HDR under bias and eight samples irradiated at HDR with all pins grounded. Two control units were used.

The ISL75054SLH samples were drawn from wafer lots F6X200.1. All samples were package in the standard 10-pin hermetically sealed ceramic flatpack package.

1.5 Downpoints

The planned irradiation downpoints for the HDR test were 0krad(Si), 10krad(Si), 30krad(Si), 50krad(Si), 75krad(Si), 100krad(Si), 125krad(Si), and 150krad(Si). The HDR irradiations were followed by a 168-hour high temperature anneal at 100°C under bias.

2. Results

HDR TID testing of the ISL75054SLHMF is complete. All tested parameters passed the datasheet limits. [Table 2](#) summarizes the results.

Table 2. ISL75054SLHMF Attributes Data

Dose Rate (rad(Si)/s)	Condition	Sample Size	Downpoint	Pass ^[1]	Fail
58.2	Biased (Figure 2)	8	Pre-irradiation	8	0
			10krad(Si)	8	0
			30krad(Si)	8	0
			50krad(Si)	8	0
			75krad(Si)	8	0
			100krad(Si)	8	0
			125krad(Si)	8	0
			150krad(Si)	8	0
			Anneal	8	0
58.2	Grounded	8	Pre-irradiation	8	0
			10krad(Si)	8	0
			30krad(Si)	8	0
			50krad(Si)	8	0
			75krad(Si)	8	0
			100krad(Si)	8	0
			125krad(Si)	8	0
			150krad(Si)	8	0
			Anneal	8	0

1. A Pass indicates a sample that passes all datasheet limits.

2.1 Variables Data

The plots in [Figure 3](#) through [Figure 40](#) illustrate the HDR response of the selected parameters shown in [Table 3](#) in the Appendix. The plots show the average tested values of the parameters as a function of total dose for each of the irradiation conditions, biased and grounded. The plots also include error bars at each downpoint, representing the minimum and maximum measured values of the samples, although in some plots the error bars might not be visible due to their values compared to the scale of the graph.

All samples passed the datasheet limits after irradiation to each level up to 150krad(Si) and the subsequent anneal.

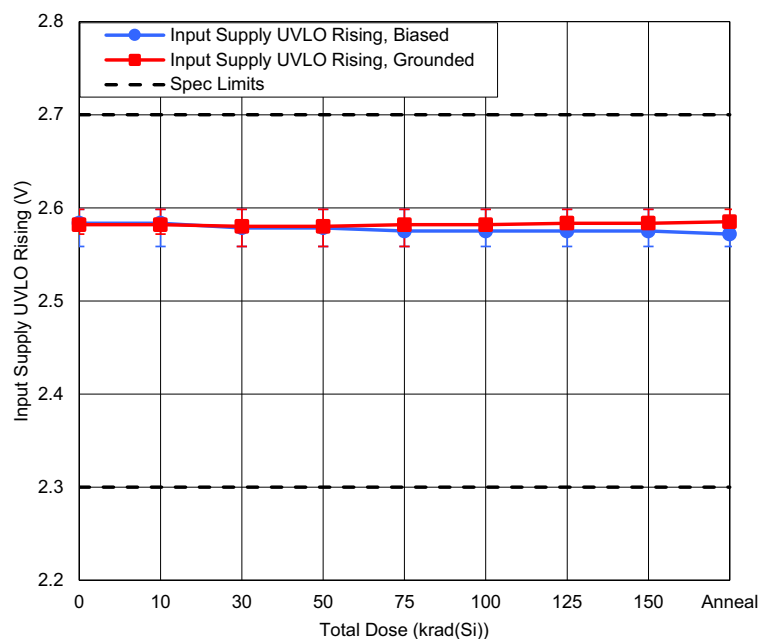


Figure 3. ISL75054SLHMF Input Supply UVLO Rising as a function of HDR irradiation for biased and grounded configurations. The error bars (if visible) represent the minimum and maximum measured values. The datasheet limits are a minimum of 2.3 and a maximum of 2.7V.

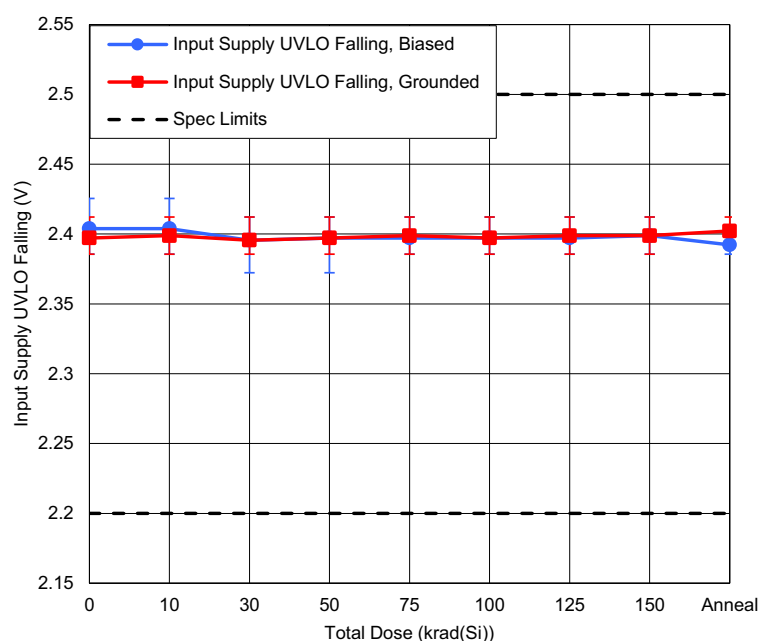


Figure 4. ISL75054SLHMF Input Supply UVLO Falling as a function of HDR irradiation for biased and grounded configurations. The error bars (if visible) represent the minimum and maximum measured values. The datasheet limits are a minimum of 2.2V and a maximum of 2.5V.

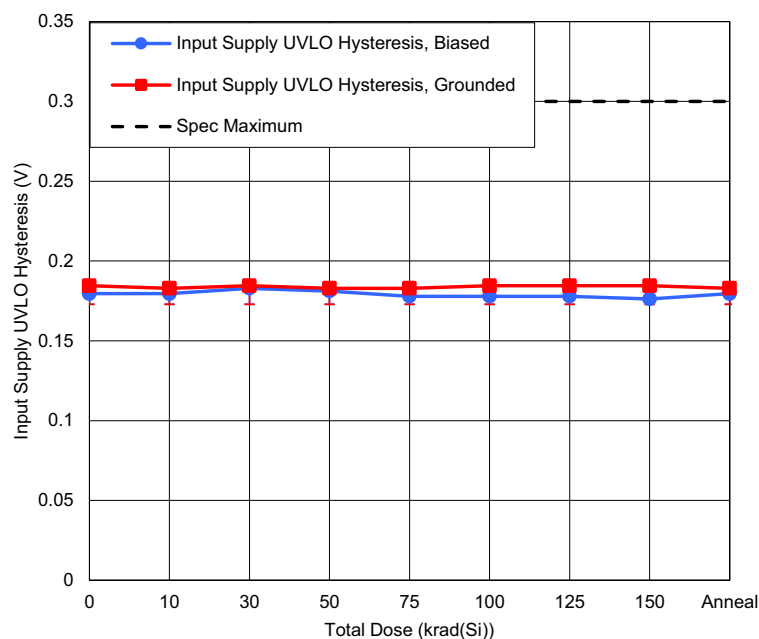


Figure 5. ISL75054SLHMF Input Supply UVLO Hysteresis as a function of HDR irradiation for biased and grounded configurations. The error bars (if visible) represent the minimum and maximum measured values. The datasheet limit is a maximum of 0.3V.

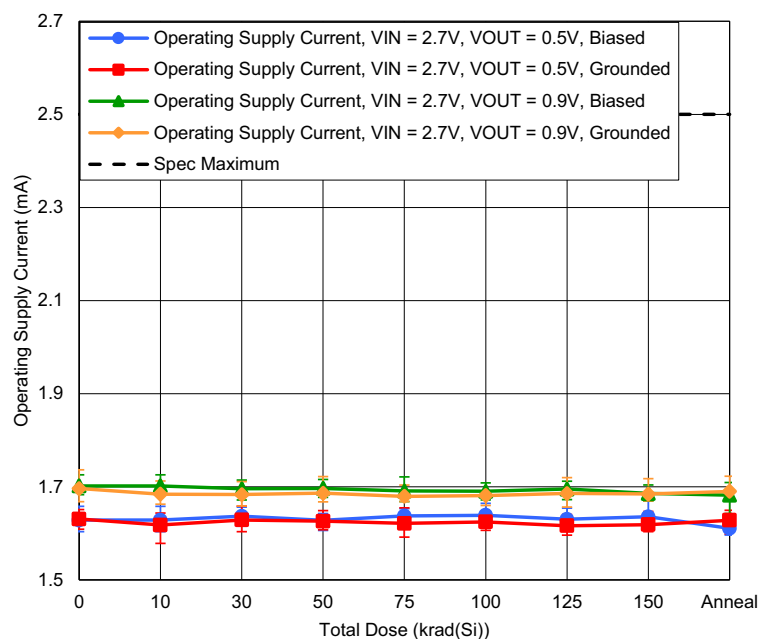


Figure 6. ISL75054SLHMF Operating Supply Current with $V_{IN} = 2.7V$, $V_{OUT} = 0.5V$ or $0.9V$, and $I_{OUT} = 0A$ as a function of HDR irradiation for biased and grounded configurations. The error bars (if visible) represent the minimum and maximum measured values. The datasheet limit is a maximum of 2.5mA.

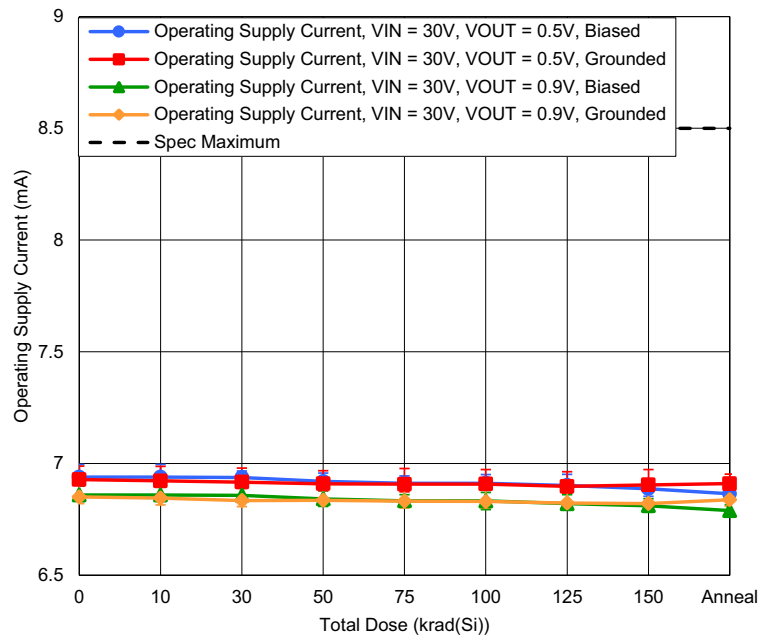


Figure 7. ISL75054SLHMF Operating Supply Current with $V_{IN} = 30V$, $V_{OUT} = 0.5V$ or $0.9V$, and $I_{OUT} = 0A$ as a function of HDR irradiation for biased and grounded configurations. The error bars (if visible) represent the minimum and maximum measured values. The datasheet limit is a maximum of 8.5mA.

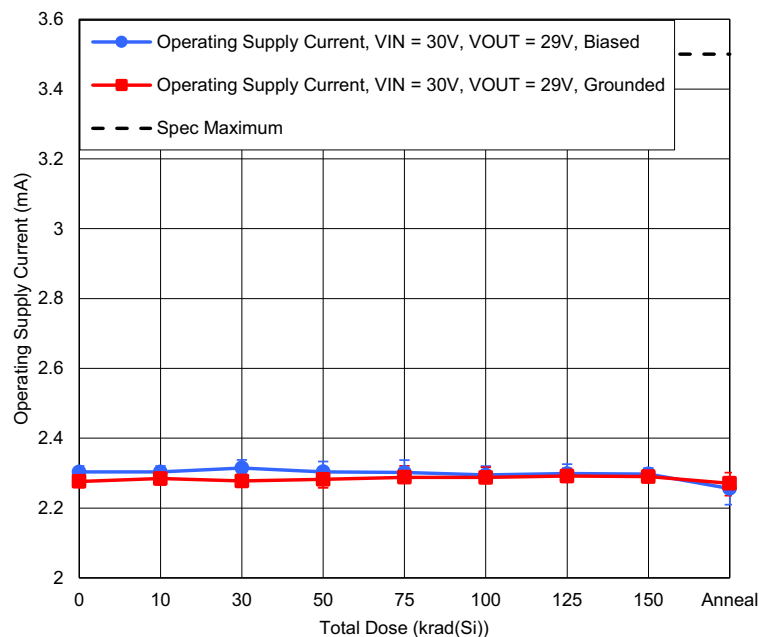


Figure 8. ISL75054SLHMF Operating Supply Current with $V_{IN} = 30V$, $V_{OUT} = 29V$, and $I_{OUT} = 0A$ as a function of HDR irradiation for biased and grounded configurations. The error bars (if visible) represent the minimum and maximum measured values. The datasheet limit is a maximum of 3.5mA.

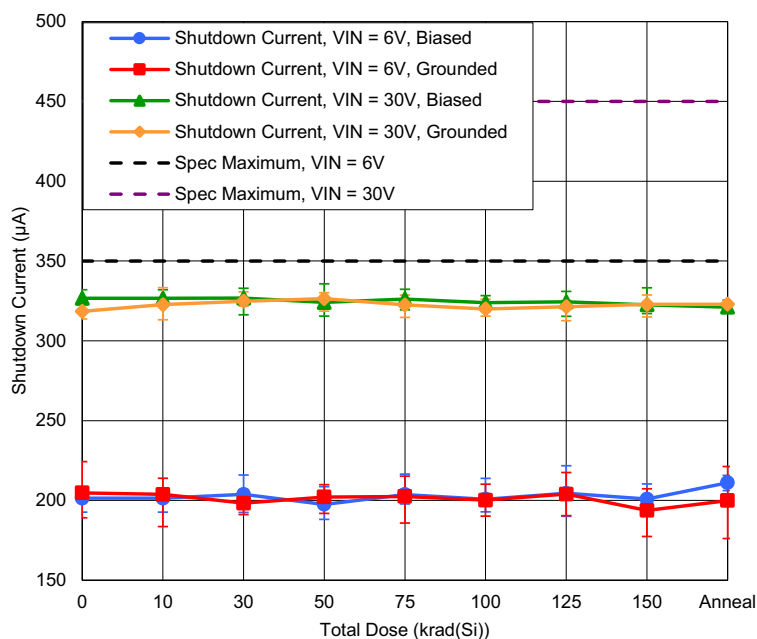


Figure 9. ISL75054SLHMF Shutdown Current with $EN = 0V$ and $V_{IN} = 6V$ or $30V$ as a function of HDR irradiation for biased and grounded configurations. The error bars (if visible) represent the minimum and maximum measured values. The datasheet limits are a maximum of $350\mu A$ when $V_{IN} = 6V$ and a maximum of $450\mu A$ when $V_{IN} = 30V$.

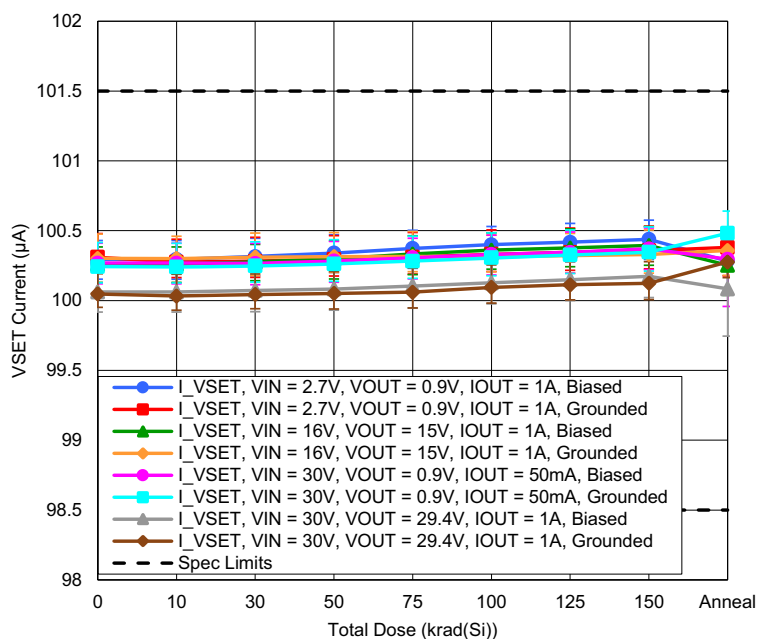


Figure 10. ISL75054SLHMF V_{SET} Current with $V_{IN} = 2.7V$, $16V$, or $30V$, $V_{OUT} = 0.9V$, $15V$, or $29.4V$, and $I_{OUT} = 1A$ as a function of HDR irradiation for biased and grounded configurations. The error bars (if visible) represent the minimum and maximum measured values. The datasheet limits are a minimum of $98.5\mu A$ and a maximum of $101.5\mu A$.

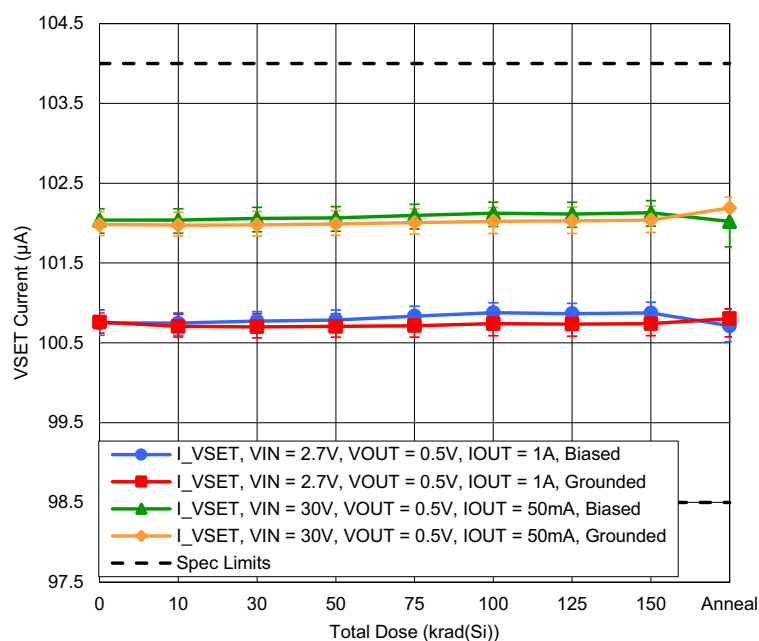


Figure 11. ISL75054SLHMF V_{SET} Current with $V_{IN} = 2.7V$ or $30V$, $V_{OUT} = 0.5V$, and $I_{OUT} = 50mA$ or $1A$ as a function of HDR irradiation for biased and grounded configurations. The error bars (if visible) represent the minimum and maximum measured values. The datasheet limits are a minimum of $98.5\mu A$ and a maximum of $104\mu A$.

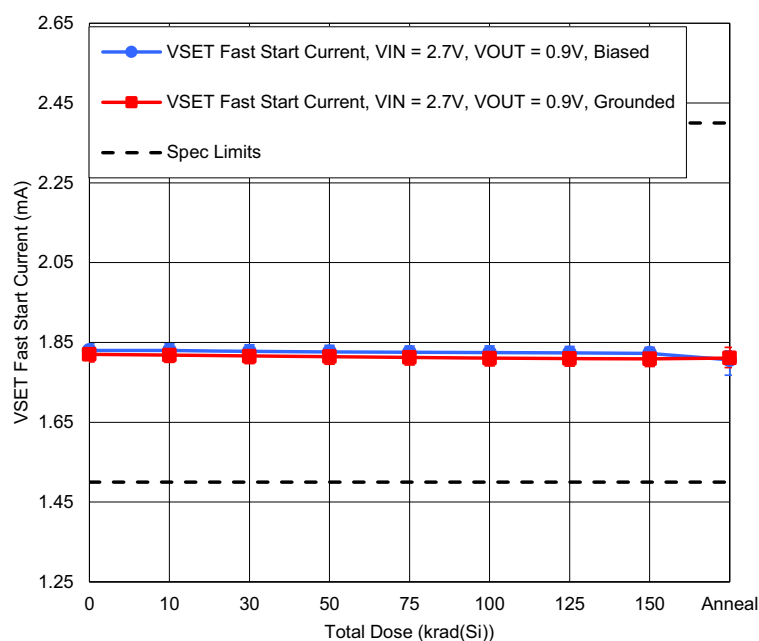


Figure 12. ISL75054SLHMF V_{SET} Fast Start Current as a function of HDR irradiation for biased and grounded configurations. The error bars (if visible) represent the minimum and maximum measured values. The datasheet limits are a minimum of $1.5mA$ and a maximum of $2.4mA$.

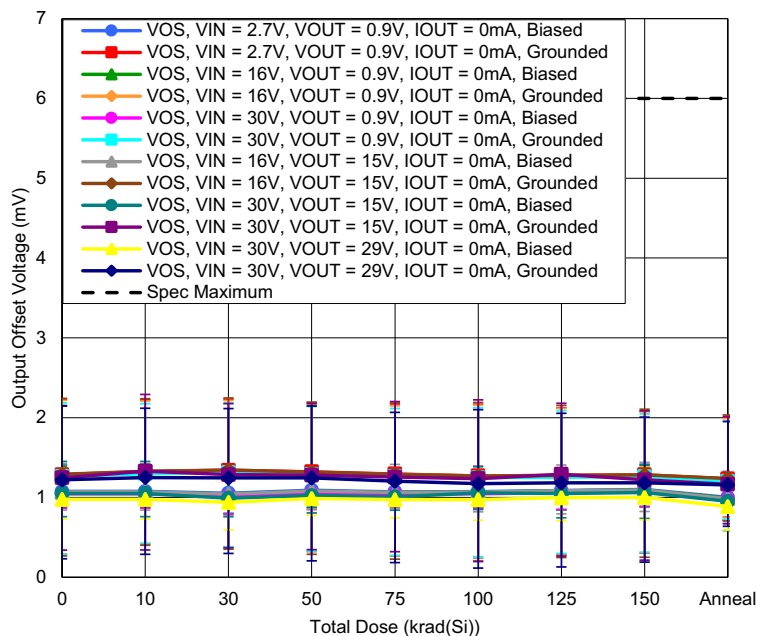


Figure 13. ISL75054SLHMF Output Offset Voltage with $V_{IN} = 2.7V$, 16V, or 30V, $V_{OUT} = 0.9V$, 15V, or 29V, and $I_{OUT} = 0mA$ as a function of HDR irradiation for biased and grounded configurations. The error bars (if visible) represent the minimum and maximum measured values. The datasheet limit is a maximum of 6mV.

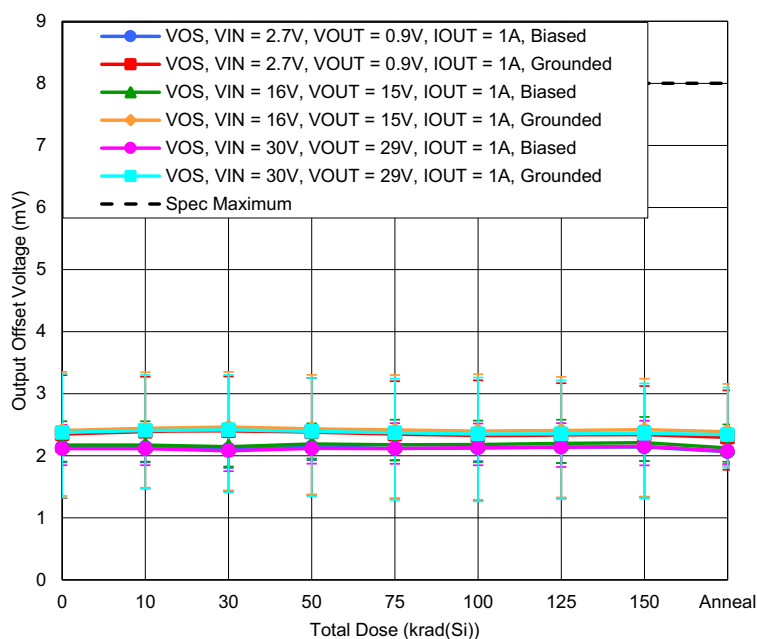


Figure 14. ISL75054SLHMF Output Offset Voltage with $V_{IN} = 2.7V$, 16V, or 30V, $V_{OUT} = 0.9V$, 15V, or 29V, and $I_{OUT} = 1A$ as a function of HDR irradiation for biased and grounded configurations. The error bars (if visible) represent the minimum and maximum measured values. The datasheet limit is a maximum of 8mV.

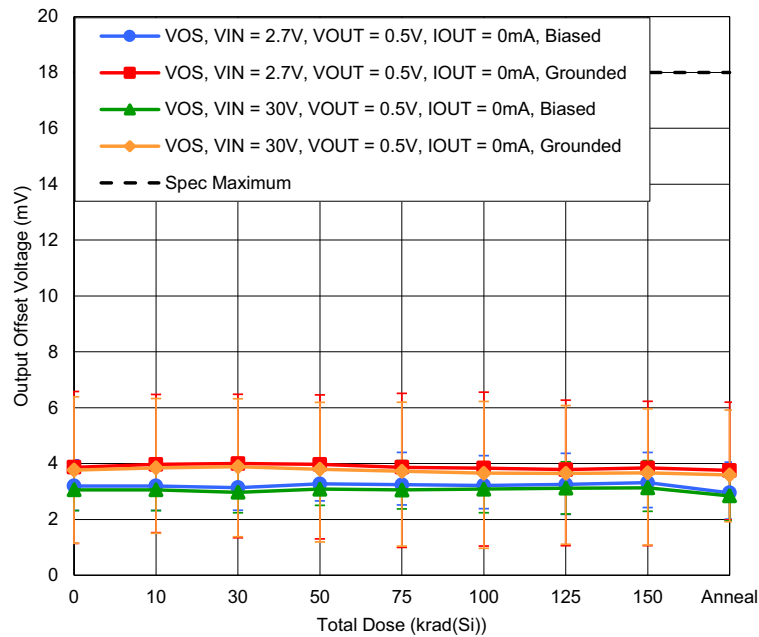


Figure 15. ISL75054SLHMF Output Offset Voltage with $V_{IN} = 2.7V$ or $30V$, $V_{OUT} = 0.5V$, and $I_{OUT} = 0mA$ as a function of HDR irradiation for biased and grounded configurations. The error bars (if visible) represent the minimum and maximum measured values. The datasheet limit is a maximum of 18mV

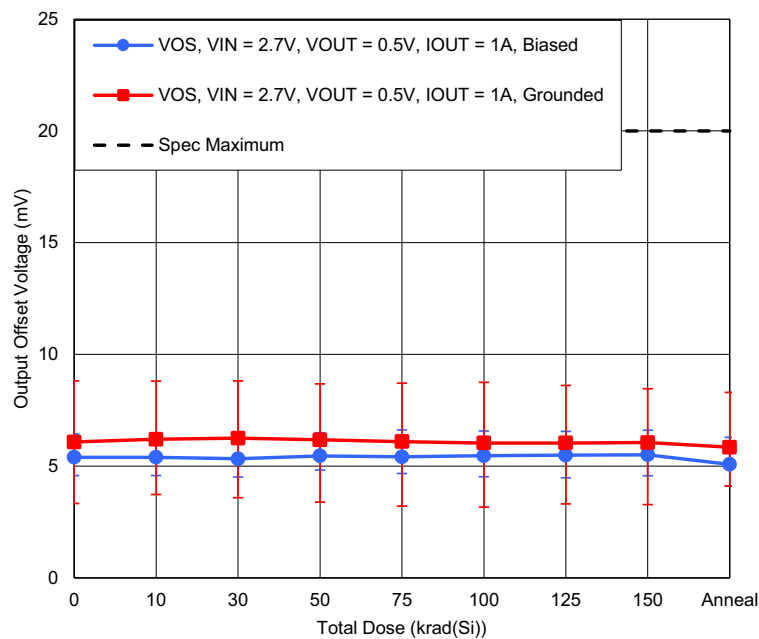


Figure 16. ISL75054SLHMF Output Offset Voltage with $V_{IN} = 2.7V$, $V_{OUT} = 0.5V$, and $I_{OUT} = 1A$ as a function of HDR irradiation for biased and grounded configurations. The error bars (if visible) represent the minimum and maximum measured values. The datasheet limit is a maximum of 20mV.

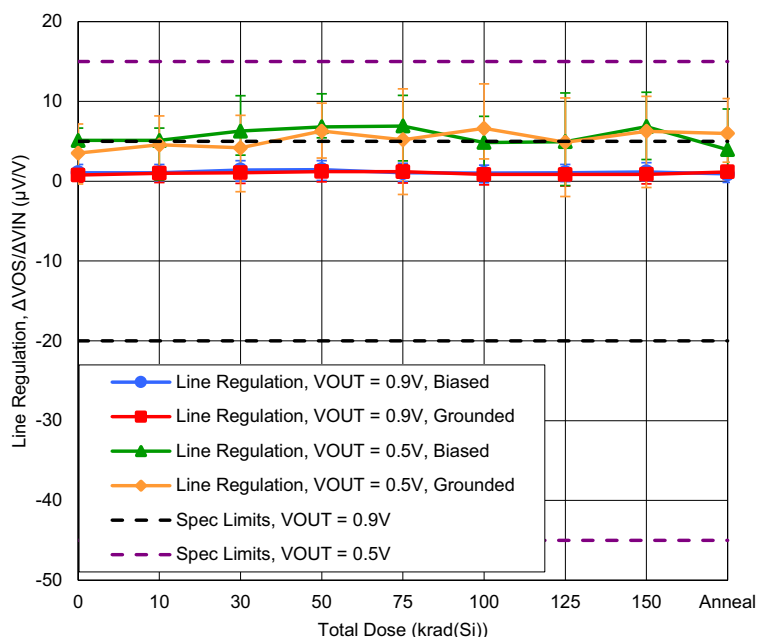


Figure 17. ISL75054SLHMF Line Regulation, $\Delta V_{OS}/\Delta V_{IN}$, with $V_{OUT} = 0.5V$ or $0.9V$, and $I_{OUT} = 1mA$ as a function of HDR irradiation for biased and grounded configurations. The error bars (if visible) represent the minimum and maximum measured values. The datasheet limits are a minimum of $-20\mu V/V$ and a maximum of $5\mu V/V$ when $V_{OUT} = 0.9V$ and a minimum of $-45\mu V/V$ and a maximum of $15\mu V/V$ when $V_{OUT} = 0.5V$.

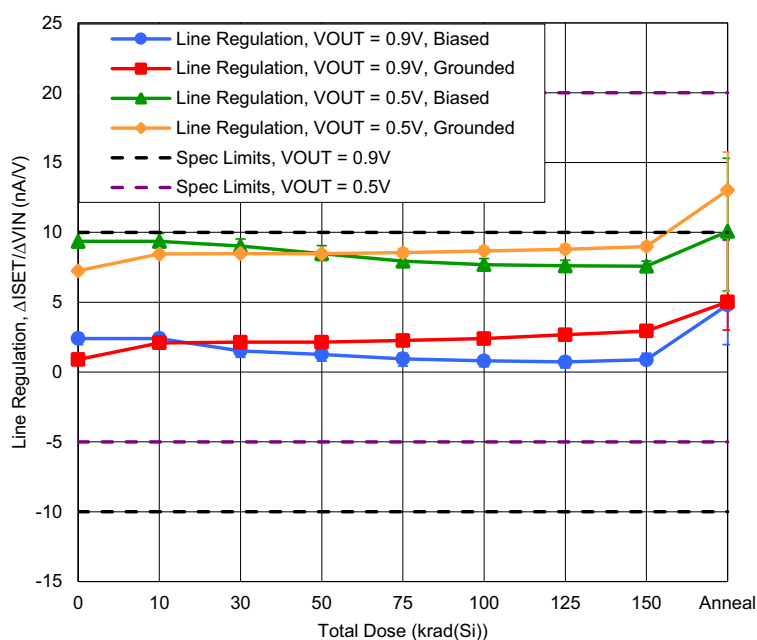


Figure 18. ISL75054SLHMF Line Regulation, $\Delta I_{SET}/\Delta V_{IN}$, with $V_{OUT} = 0.5V$ or $0.9V$, and $I_{OUT} = 1mA$ as a function of HDR irradiation for biased and grounded configurations. The error bars (if visible) represent the minimum and maximum measured values. The datasheet limits are a minimum of $-10nA/V$ and a maximum of $10nA/V$ when $V_{OUT} = 0.9V$ and a minimum of $-5nA/V$ and a maximum of $20nA/V$ when $V_{OUT} = 0.5V$.

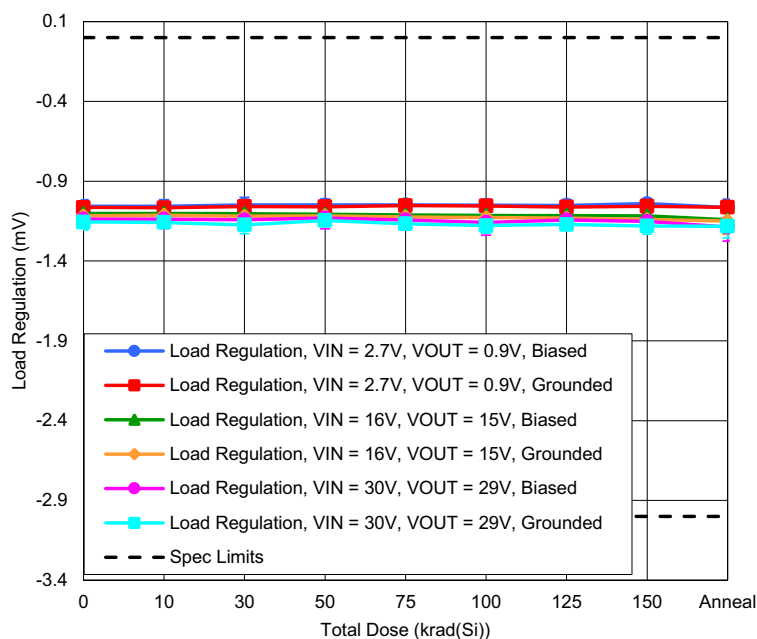


Figure 19. ISL75054SLHMF Load Regulation with $V_{IN} = 2.7V$, 16V or 30V, $V_{OUT} = 0.9V$, 15V or 29V, and $I_{OUT} = 0mA$ to 1A as a function of HDR irradiation for biased and grounded configurations. The error bars (if visible) represent the minimum and maximum measured values. The datasheet limits are a minimum of -3mV and a maximum of 0mV.

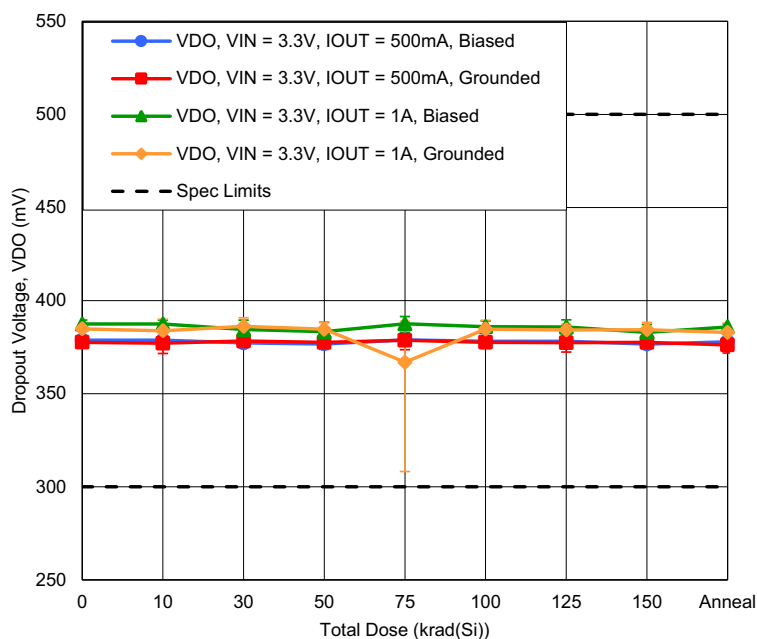


Figure 20. ISL75054SLHMF Dropout Voltage, V_{DO} , with $V_{IN} = 3.3V$ and $I_{OUT} = 500mA$ or 1A as a function of HDR irradiation for biased and grounded configurations. The error bars (if visible) represent the minimum and maximum measured values. The datasheet limits are a minimum of 300mV and a maximum of 500mV.

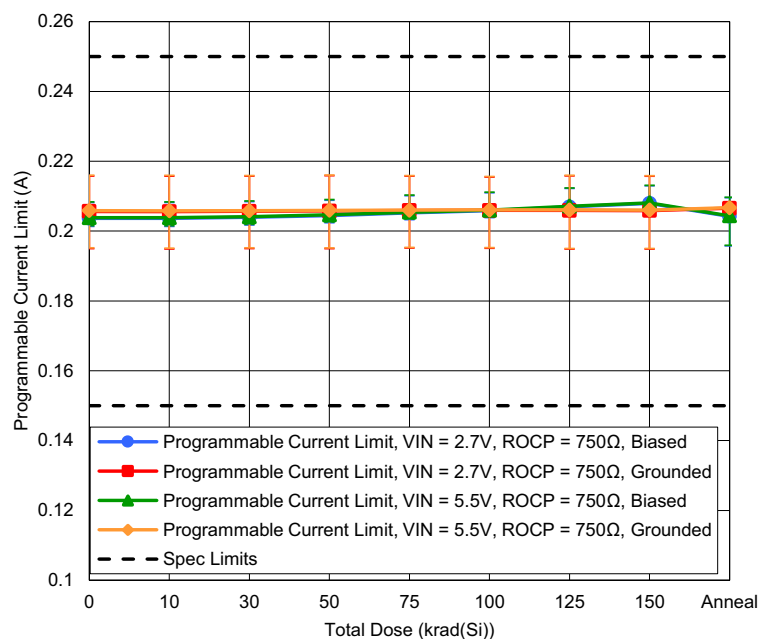


Figure 21. ISL75054SLHMF Programmable Current Limit with $V_{IN} = 2.7V$ or $5.5V$ and $R_{OCP} = 750\Omega$ as a function of HDR irradiation for biased and grounded configurations. The error bars (if visible) represent the minimum and maximum measured values. The datasheet limits are a minimum of 0.15A and a maximum of 0.25A.

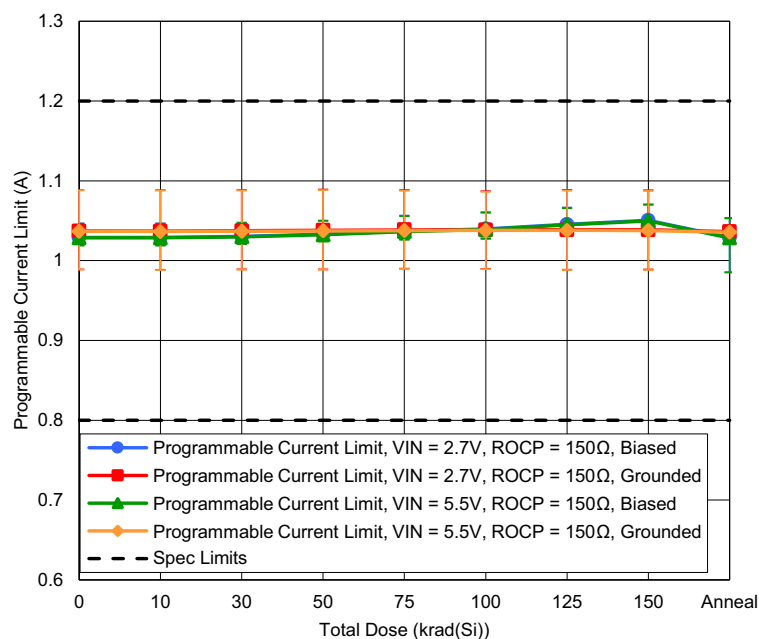


Figure 22. ISL75054SLHMF Programmable Current Limit with $V_{IN} = 2.7V$ or $5.5V$ and $R_{OCP} = 150\Omega$ as a function of HDR irradiation for biased and grounded configurations. The error bars (if visible) represent the minimum and maximum measured values. The datasheet limits are a minimum of 0.8A and a maximum of 1.2A.

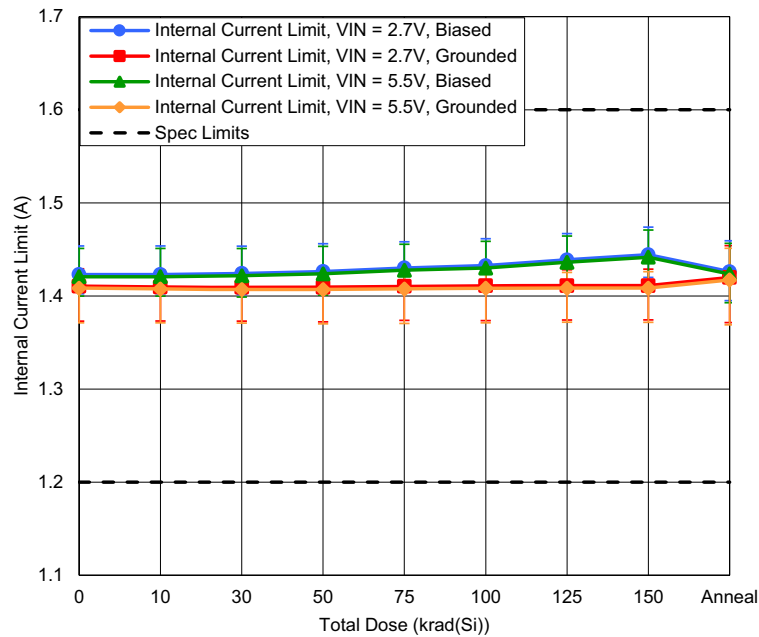


Figure 23. ISL75054SLHMF Internal Current Limit with $V_{IN} = 2.7$ or $5.5V$ and $R_{OCP} = 0\Omega$ as a function of HDR irradiation for biased and grounded configurations. The error bars (if visible) represent the minimum and maximum measured values. The datasheet limits are a minimum of $1.2A$ and a maximum of $1.6A$.

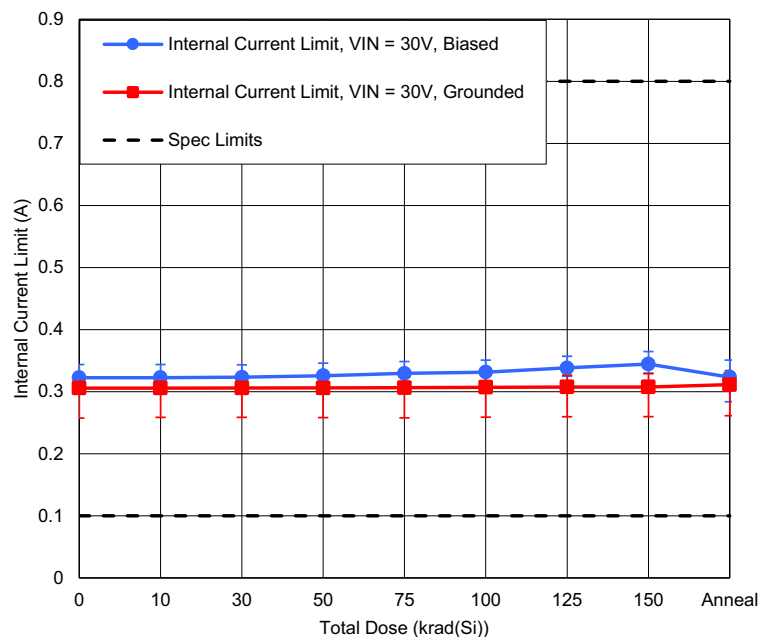


Figure 24. ISL75054SLHMF Internal Current Limit with $V_{IN} = 30V$ and $R_{OCP} = 0\Omega$ as a function of HDR irradiation for biased and grounded configurations. The error bars (if visible) represent the minimum and maximum measured values. The datasheet limits are a minimum of $0.1A$ and a maximum of $0.8A$.

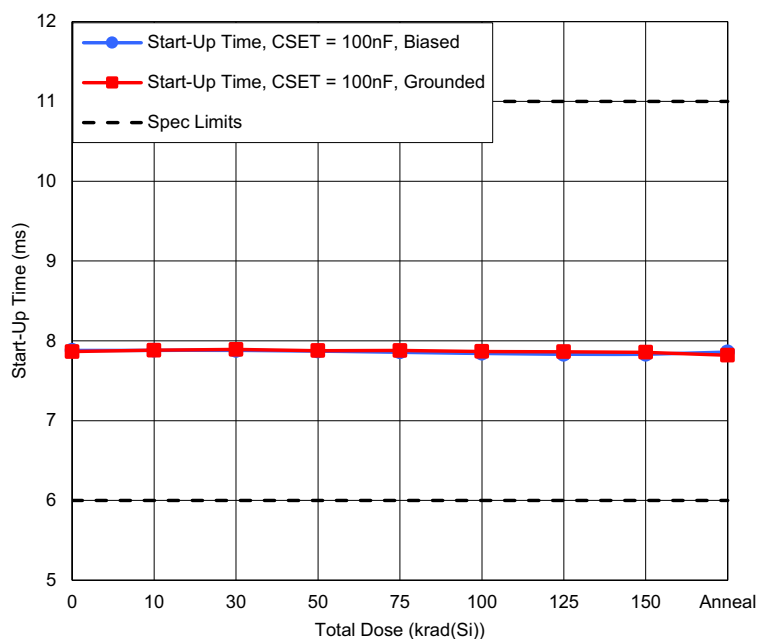


Figure 25. ISL75054SLHMF Start-Up Time with $V_{IN} = 6V$, $V_{OUT} = 5V$, $C_{SET} = 100nF$, $I_{OUT} = 1A$ and Fast Start-Up disabled as a function of HDR irradiation for biased and grounded configurations. The error bars (if visible) represent the minimum and maximum measured values. The datasheet limits are a minimum of 6ms and a maximum of 11ms.

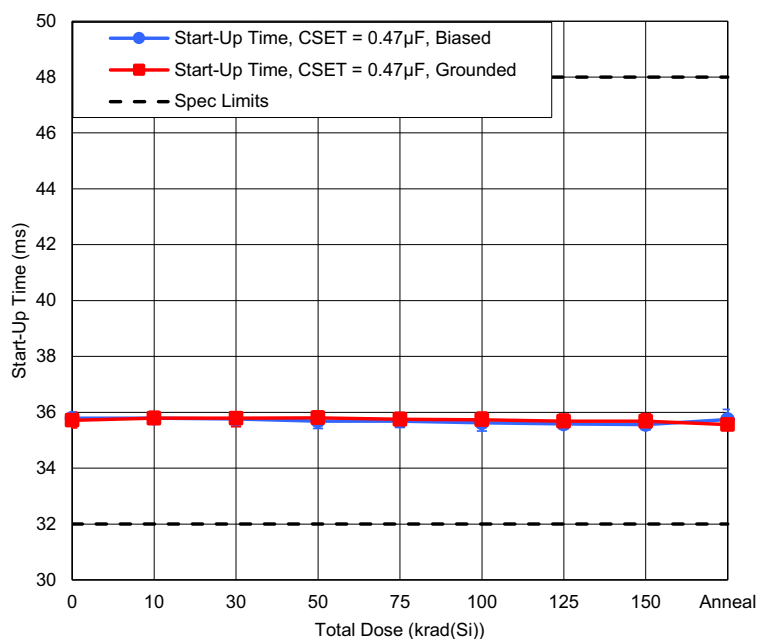


Figure 26. ISL75054SLHMF Start-Up Time with $V_{IN} = 6V$, $V_{OUT} = 5V$, $C_{SET} = 0.47\mu F$, $I_{OUT} = 1A$ and Fast Start-Up disabled as a function of HDR irradiation for biased and grounded configurations. The error bars (if visible) represent the minimum and maximum measured values. The datasheet limits are a minimum of 32ms and a maximum of 48ms.

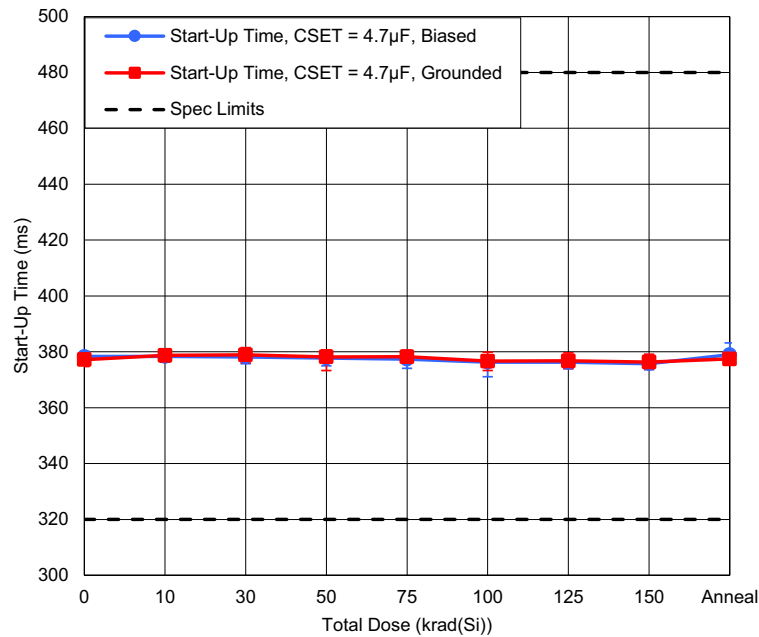


Figure 27. ISL75054SLHMF Start-Up Time with $V_{IN} = 6V$, $V_{OUT} = 5V$, $C_{SET} = 4.7\mu F$, $I_{OUT} = 1A$ and Fast Start-Up disabled as a function of HDR irradiation for biased and grounded configurations. The error bars (if visible) represent the minimum and maximum measured values. The datasheet limits are a minimum of 320ms and a maximum of 480ms.

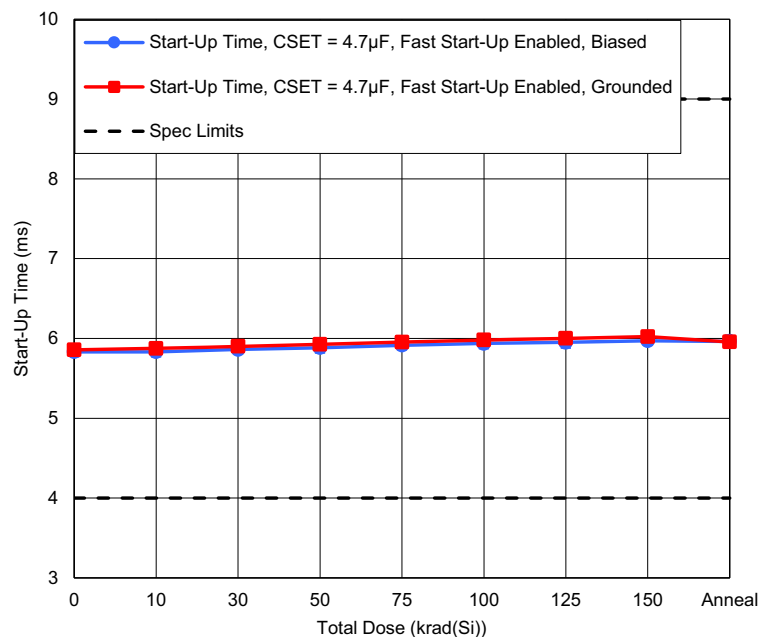


Figure 28. ISL75054SLHMF Start-Up Time with $V_{IN} = 6V$, $V_{OUT} = 5V$, $C_{SET} = 4.7\mu F$, $I_{OUT} = 1A$ and Fast Start-Up enabled as a function of HDR irradiation for biased and grounded configurations. The error bars (if visible) represent the minimum and maximum measured values. The datasheet limits are a minimum of 4ms and a maximum of 9ms.

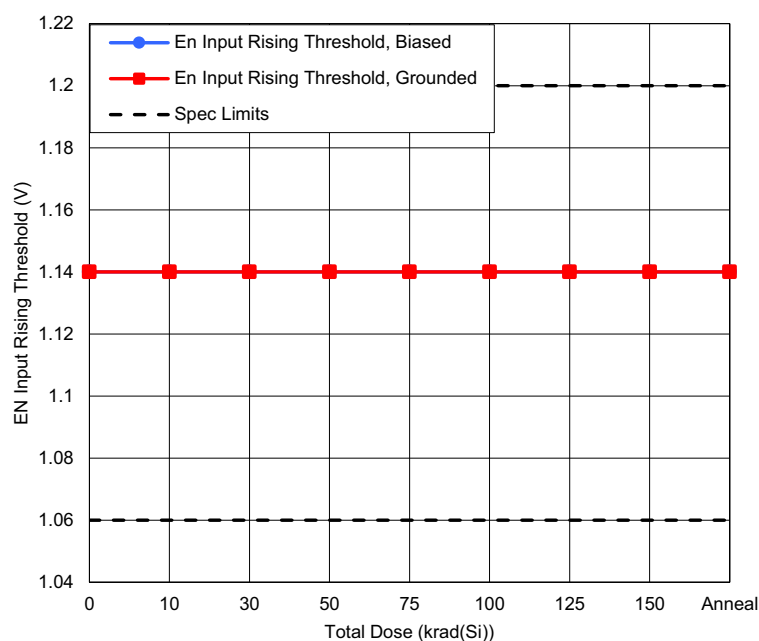


Figure 29. ISL75054SLHMF EN Input Rising Threshold as a function of HDR irradiation for biased and grounded configurations. The error bars (if visible) represent the minimum and maximum measured values. The datasheet limit is a minimum of 1.06V and a maximum of 1.2V.

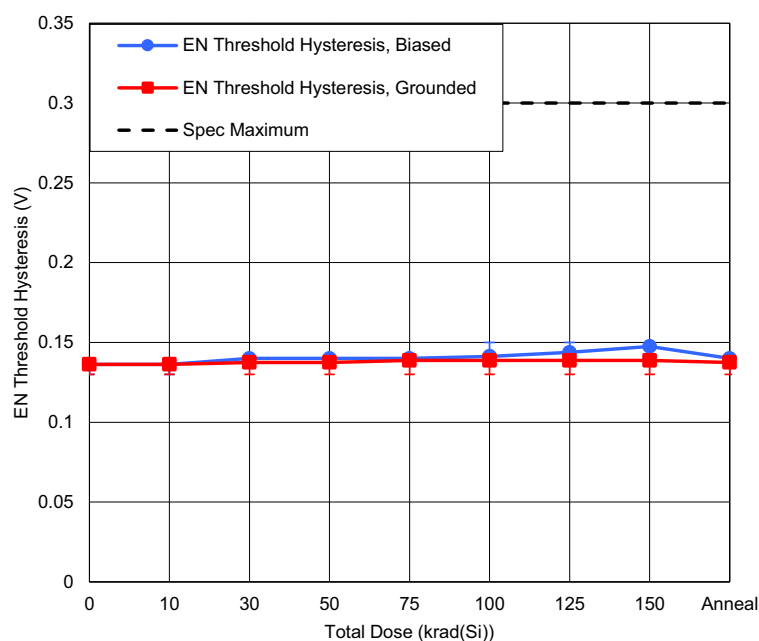


Figure 30. ISL75054SLHMF EN Threshold Hysteresis as a function of HDR irradiation for biased and grounded configurations. The error bars (if visible) represent the minimum and maximum measured values. The datasheet limit is a maximum of 0.3V.

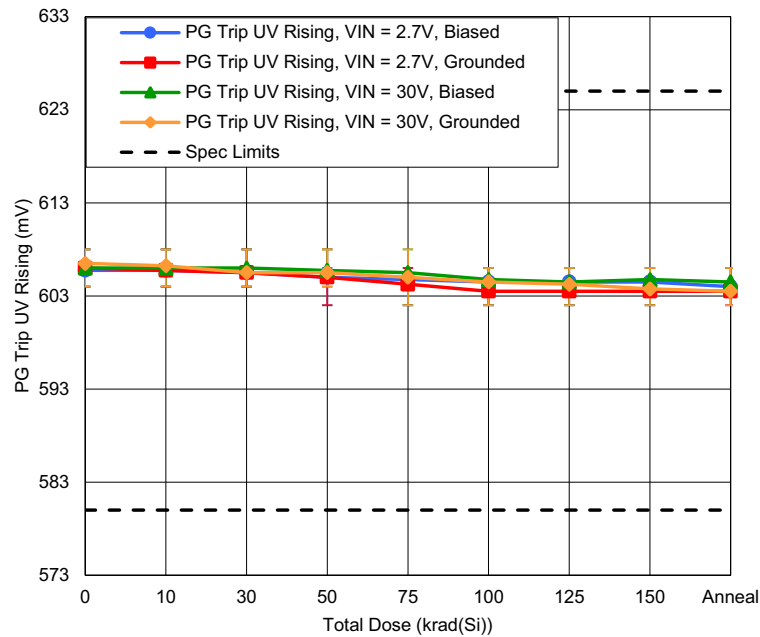


Figure 31. ISL75054SLHMF PG Trip UV Rising with $V_{IN} = 2.7V$ or $30V$ as a function of HDR irradiation for biased and grounded configurations. The error bars (if visible) represent the minimum and maximum measured values. The datasheet limits are a minimum of 580mV and a maximum of 625mV.

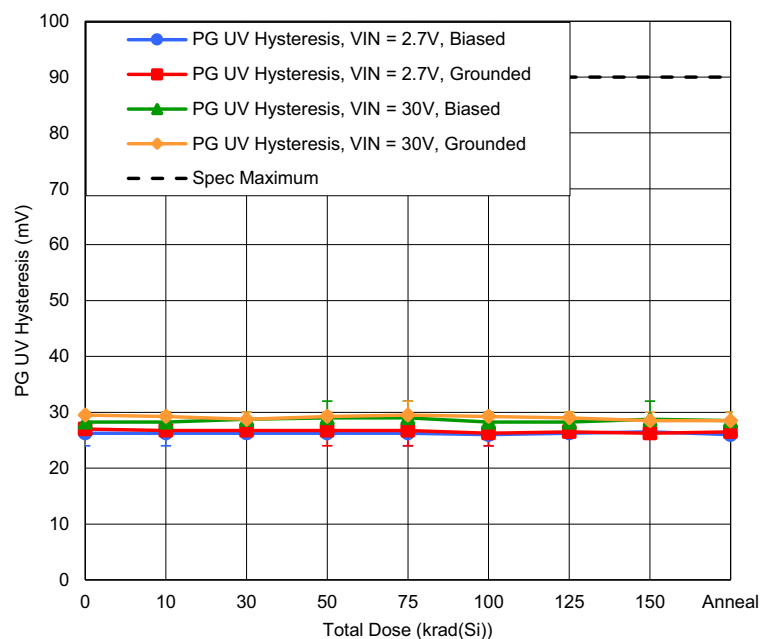


Figure 32. ISL75054SLHMF PG UV Hysteresis with $V_{IN} = 2.7V$ or $30V$ as a function of HDR irradiation for biased and grounded configurations. The error bars (if visible) represent the minimum and maximum measured values. The datasheet limit is a maximum of 90mV.

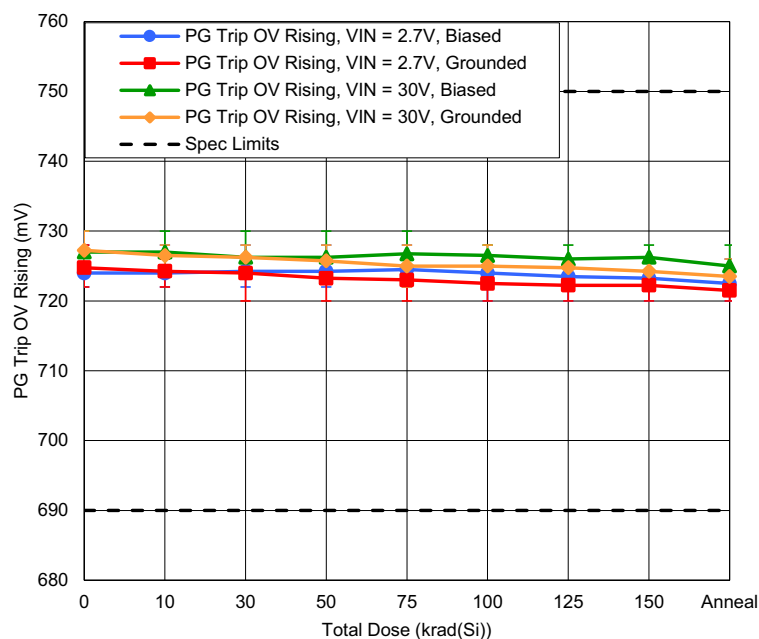


Figure 33. ISL75054SLHMF PG Trip OV Rising with $V_{IN} = 2.7V$ or $30V$ as a function of HDR irradiation for biased and grounded configurations. The error bars (if visible) represent the minimum and maximum measured values. The datasheet limits are a minimum of 690mV and a maximum of 750mV.

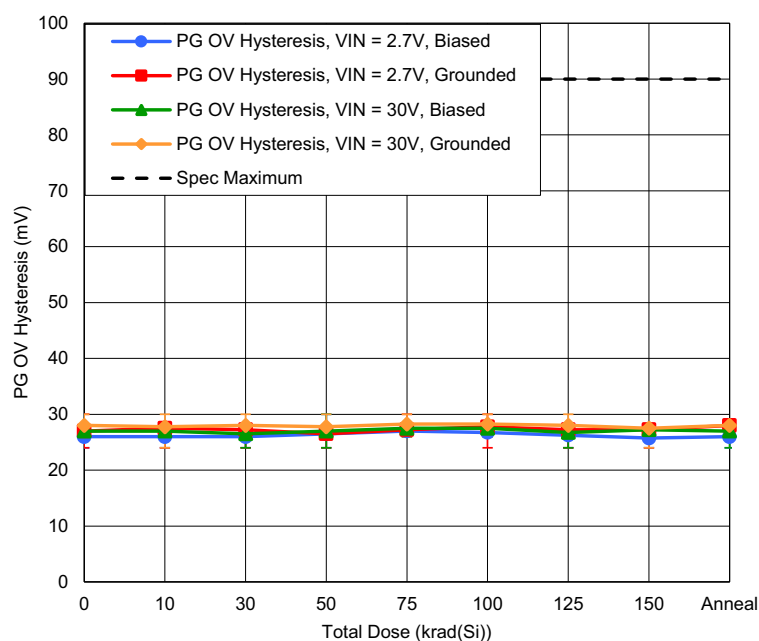


Figure 34. ISL75054SLHMF PG OV Hysteresis with $V_{IN} = 2.7V$ or $30V$ as a function of HDR irradiation for biased and grounded configurations. The error bars (if visible) represent the minimum and maximum measured values. The datasheet limit is a maximum of 90mV.

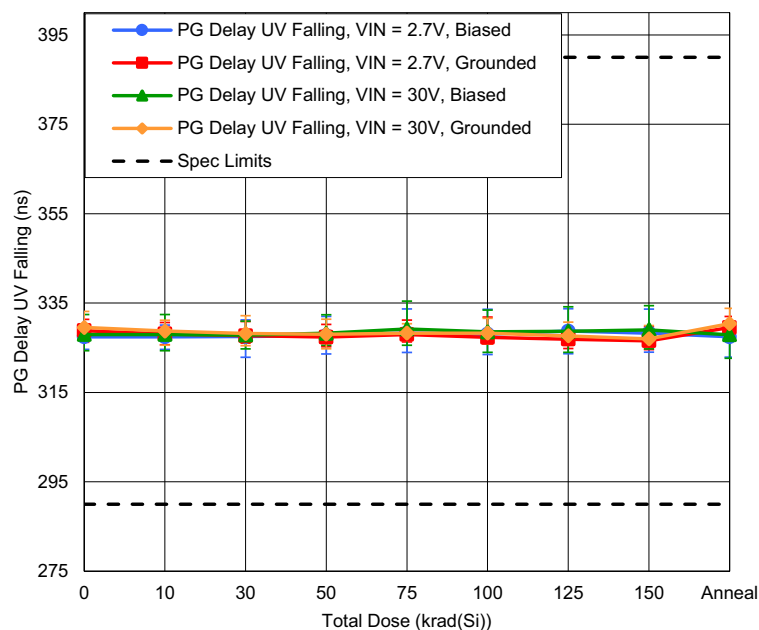


Figure 35. ISL75054SLHMF PG Delay UV Falling with $V_{IN} = 2.7V$ or $30V$ and $R_{PULLUP} = 100k\Omega$ as a function of HDR irradiation for biased and grounded configurations. The error bars (if visible) represent the minimum and maximum measured values. The datasheet limits are a minimum of 290ns and a maximum of 390ns.

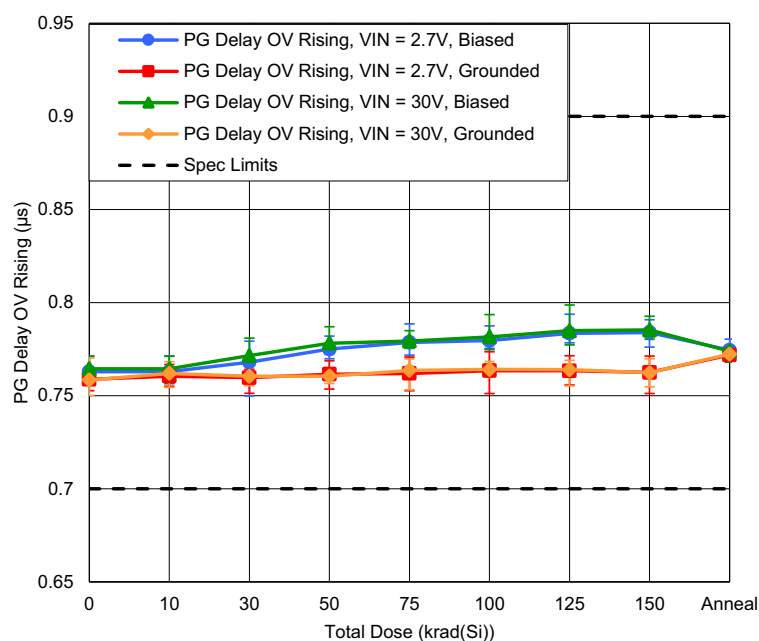


Figure 36. ISL75054SLHMF PG Delay OV Rising with $V_{IN} = 2.7V$ or $30V$ and $R_{PULLUP} = 100k\Omega$ as a function of HDR irradiation for biased and grounded configurations. The error bars (if visible) represent the minimum and maximum measured values. The datasheet limits are a minimum of 0.7 μs and a maximum of 0.9 μs .

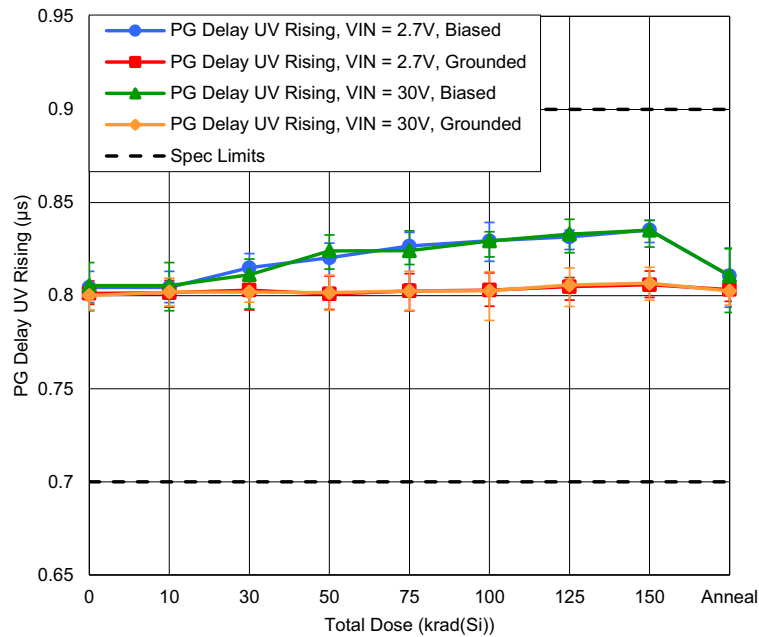


Figure 37. ISL75054SLHMF PG Delay UV Rising with $V_{IN} = 2.7V$ or $30V$ and $R_{PULLUP} = 100k\Omega$ as a function of HDR irradiation for biased and grounded configurations. The error bars (if visible) represent the minimum and maximum measured values. The datasheet limits are a minimum of $0.7\mu s$ and a maximum of $0.9\mu s$.

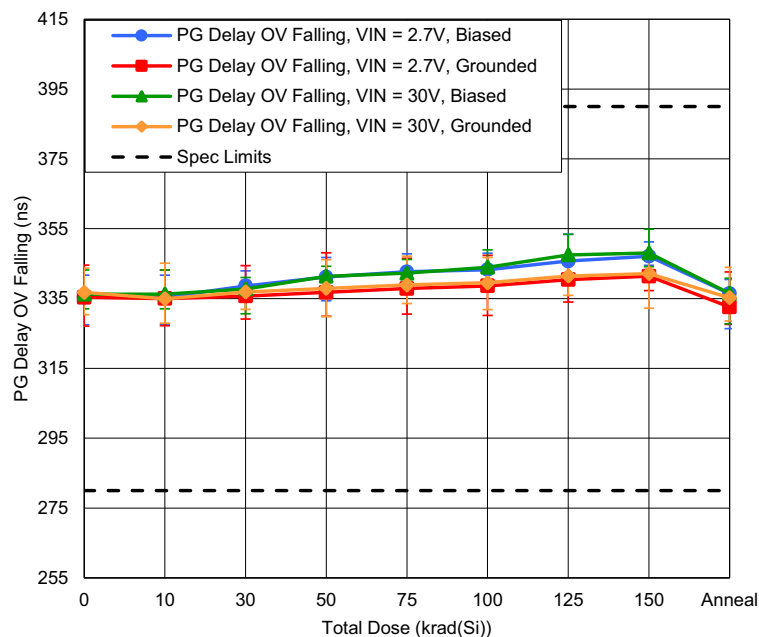


Figure 38. ISL75054SLHMF PG Delay OV Falling with $V_{IN} = 2.7V$ or $30V$ and $R_{PULLUP} = 100k\Omega$ as a function of HDR irradiation for biased and grounded configurations. The error bars (if visible) represent the minimum and maximum measured values. The datasheet limits are a minimum of $280ns$ and a maximum of $390ns$.

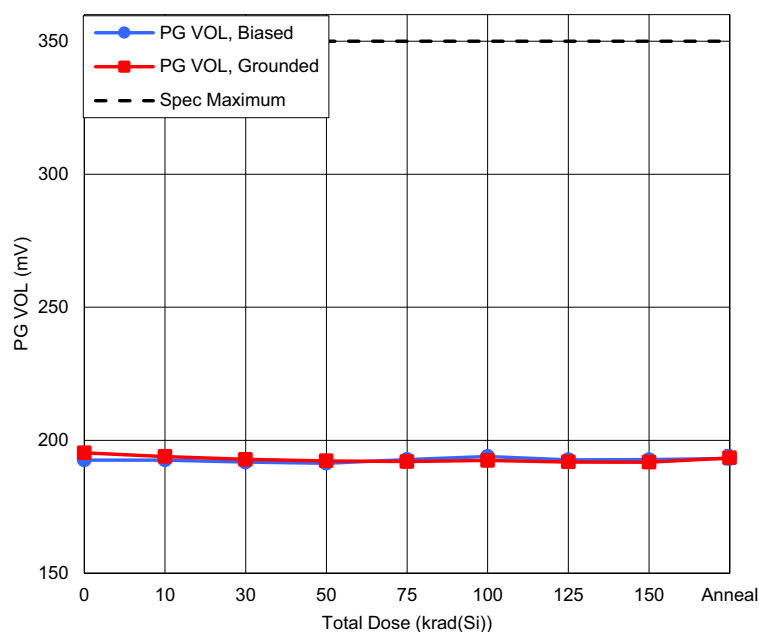


Figure 39. ISL75054SLHMF PG VOL as a function of HDR irradiation for biased and grounded configurations. The error bars (if visible) represent the minimum and maximum measured values. The datasheet limit is a maximum of 350mV.

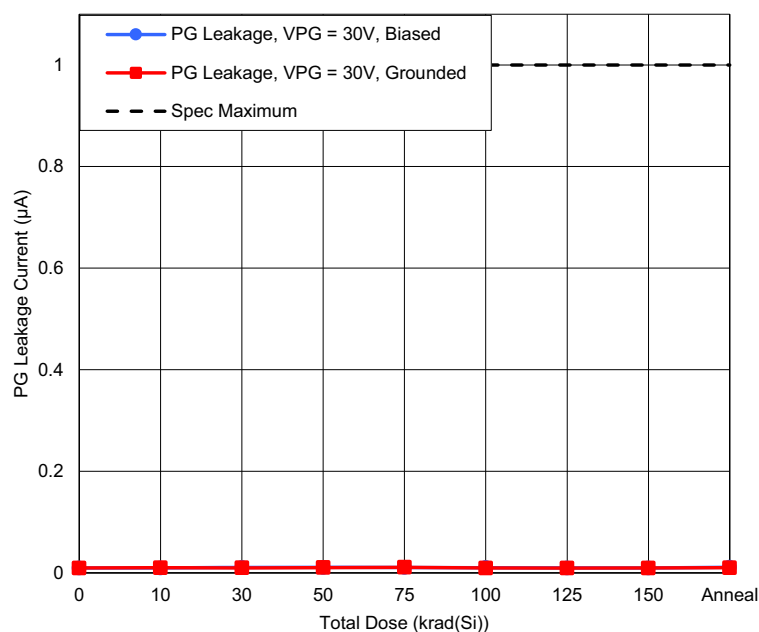


Figure 40. ISL75054SLHMF PG Leakage as a function of HDR irradiation for biased and grounded configurations. The error bars (if visible) represent the minimum and maximum measured values. The datasheet limit is a maximum of 1µA.

3. Discussion and Conclusion

This document reports the results of the HDR TID test of the ISL75054SLHMF radiation hardened ultra-low noise LDO. The irradiation of biased and grounded samples to 150krad(Si) at a HDR of 58.2rad(Si)/s was followed by a 168-hour anneal at 100°C under bias. All datasheet parameters passed at all downpoints.

4. Revision History

Revision	Date	Description
1.00	Oct 21, 2025	Initial release.

A. Appendix

Table 3 lists the datasheet parameters that are considered indicative of part performance. These parameters are plotted in Figure 3 through Figure 40. All limits are taken from the ISL75054SLH datasheet, which might have more details on test conditions.

Table 3. ISL75054SLH Datasheet Total Dose Parameters ($T_A = 25^\circ\text{C}$)

Fig.	Parameter	Test Conditions	Min	Max	Unit
3	Input Supply UVLO Rising	V_{IN} UVLO Rising	2.3	2.7	V
4	Input Supply UVLO Falling	V_{IN} UVLO Falling	2.2	2.5	V
5	Input Supply UVLO Hysteresis	V_{IN} UVLO Hysteresis		0.3	V
6	Operating Supply Current	$V_{IN} = 2.7\text{V}$, $V_{OUT} = 0.5\text{V}$, $I_{OUT} = 0\text{A}$	-	2.5	mA
		$V_{IN} = 2.7\text{V}$, $V_{OUT} = 0.9\text{V}$, $I_{OUT} = 0\text{A}$			
7		$V_{IN} = 30\text{V}$, $V_{OUT} = 0.5\text{V}$, $I_{OUT} = 0\text{A}$	-	8.5	
		$V_{IN} = 30\text{V}$, $V_{OUT} = 0.9\text{V}$, $I_{OUT} = 0\text{A}$			
8		$V_{IN} = 30\text{V}$, $V_{OUT} = 29\text{V}$, $I_{OUT} = 0\text{A}$	-	3.5	
9	Shutdown Current	$EN = 0\text{V}$; $V_{IN} = 6\text{V}$	-	350	μA
		$EN = 0\text{V}$; $V_{IN} = 30\text{V}$	-	450	
10	V_{SET} Current	$V_{IN} = 2.7\text{V}$, 16V , 30V ; $V_{OUT} = 0.9\text{V}$, 15V , 29.4V ; $I_{OUT} = 1\text{A}$	98.5	101.5	μA
11	V_{SET} Fast Start Current	$V_{IN} = 2.7\text{V}$, 30V ; $V_{OUT} = 0.5$; $I_{OUT} = 50\text{mA}$, 1A	98.5	104	μA
12		$V_{IN} = 2.7\text{V}$; $V_{SET} = 0.9\text{V}$; $V_{PGFB} = 600\text{mV}$	1.5	2.4	mA
13	Output Offset Voltage	$V_{IN} = 2.7\text{V}$, 16V , 30V ; $V_{OUT} = 0.9\text{V}$, 15V , 29V ; $I_{OUT} = 0\text{mA}$	-	6	mV
14		$V_{IN} = 2.7\text{V}$, 16V , 30V ; $V_{OUT} = 0.9\text{V}$, 15V , 29V ; $I_{OUT} = 1\text{A}$	-	8	mV
15		$V_{IN} = 2.7\text{V}$, 30V ; $V_{OUT} = 0.5$; $I_{OUT} = 0\text{mA}$	-	18	mV
16		$V_{IN} = 2.7\text{V}$; $V_{OUT} = 0.5$; $I_{OUT} = 1\text{A}$	-	20	mV
17	Line Regulation, $\Delta V_{OS}/\Delta V_{IN}$	$V_{OUT} = 0.9\text{V}$; $I_{OUT} = 1\text{mA}$	-20	5	$\mu\text{V/V}$
18		$V_{OUT} = 0.5\text{V}$; $I_{OUT} = 1\text{mA}$	-45	15	$\mu\text{V/V}$
19	Line Regulation, $\Delta I_{SET}/\Delta V_{IN}$	$V_{OUT} = 0.9\text{V}$; $I_{OUT} = 1\text{mA}$	-10	10	nA/V
		$V_{OUT} = 0.5\text{V}$; $I_{OUT} = 1\text{mA}$	-5	20	nA/V
20	Load Regulation ΔV_{OUT}	$V_{IN} = 2.7\text{V}$, 16V , 30V ; $V_{OUT} = 0.9\text{V}$, 15V , 29V ; $I_{OUT} = 0\text{mA}$ to 1A	-3	0	mV
	Dropout Voltage, V_{DO}	$V_{IN} = 3.3\text{V}$; $I_{OUT} = 500\text{mA}$, 1A	300	500	mV
21	Programmable Current Limit	$V_{IN} = 2.7\text{V}$, 5.5V ; $R_{OCP} = 750\Omega$	0.15	0.25	A
22		$V_{IN} = 2.7\text{V}$, 5.5V ; $R_{OCP} = 150\Omega$	0.8	1.2	A
23	Internal Current Limit	$V_{IN} = 2.7\text{V}$, 5.5V ; $R_{OCP} = 0\Omega$	1.2	1.6	A
24		$V_{IN} = 30\text{V}$; $R_{OCP} = 0\Omega$	0.1	0.8	A
25	Start-Up Time	$V_{IN} = 6\text{V}$; $V_{OUT} = 5\text{V}$; $C_{SET} = 100\text{nF}$; $I_{OUT} = 1\text{A}$; Fast Start-Up Disabled	6	11	ms
26		$V_{IN} = 6\text{V}$; $V_{OUT} = 5\text{V}$; $C_{SET} = 0.47\mu\text{F}$; $I_{OUT} = 1\text{A}$; Fast Start-Up Disabled	32	48	ms
27		$V_{IN} = 6\text{V}$; $V_{OUT} = 5\text{V}$; $C_{SET} = 4.7\mu\text{F}$; $I_{OUT} = 1\text{A}$; Fast Start-Up Disabled	320	480	ms
28		$V_{IN} = 6\text{V}$; $V_{OUT} = 5\text{V}$; $C_{SET} = 4.7\mu\text{F}$; $I_{OUT} = 1\text{A}$; Fast Start-Up Enabled	4	9	ms
29	EN Input Rising Threshold	-	1.06	1.2	V
30	EN Threshold Hysteresis	-	-	0.3	V
31	PG Trip UV Rising	$V_{IN} = 2.7\text{V}$, 30V	580	625	mV
32	PG UV Hysteresis	$V_{IN} = 2.7\text{V}$, 30V	-	90	mV
33	PG Trip OV Rising	$V_{IN} = 2.7\text{V}$, 30V	690	750	mV

Table 3. ISL75054SLH Datasheet Total Dose Parameters ($T_A = 25^\circ\text{C}$) (Cont.)

Fig.	Parameter	Test Conditions	Min	Max	Unit
34	PG OV Hysteresis	$V_{IN} = 2.7\text{V}, 30\text{V}$	-	90	mV
35	PG Delay UV Falling	$V_{IN} = 2.7\text{V}, 30\text{V}; R_{PULLUP} = 100\text{k}\Omega$	290	390	ns
36	PG Delay OV Rising	$V_{IN} = 2.7\text{V}, 30\text{V}; R_{PULLUP} = 100\text{k}\Omega$	0.7	0.9	μs
37	PG Delay UV Rising	$V_{IN} = 2.7\text{V}, 30\text{V}; R_{PULLUP} = 100\text{k}\Omega$	0.7	0.9	μs
38	PG Delay OV Falling	$V_{IN} = 2.7\text{V}, 30\text{V}; R_{PULLUP} = 100\text{k}\Omega$	280	390	ns
39	PG VOL	$V_{IN} = 2.7\text{V}; I_{PG} = 1\text{mA}$	-	350	mV
40	PG Leakage	$V_{PG} = 30\text{V}$	-	1	μA

Related Literature

For a full list of related documents, visit our website:

- [ISL75054SLH](#) device page
- MIL-STD-883 test method 1019

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Corporate Headquarters

TOYOSU FORESIA, 3-2-24 Toyosu,
Koto-ku, Tokyo 135-0061, Japan
www.renesas.com

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