

TABLE 2: ELECTRICAL CHARACTERISTICS (Pre-Irradiation) Specifications are at $T_A = 25^\circ\text{C}$, $V_{IN} = 20\text{V}$, $V_{CC} = \text{BOOST} = 10\text{V}$, $\text{SHDN} = 2\text{V}$, $R_{SET} = 49.9\text{k}\Omega$, $\text{SENSE}^- = \text{SENSE}^+ = 10\text{V}$, $\text{SGND} = \text{PGND}$, $\text{SW} = 0\text{V}$.

PARAMETER	CONDITIONS	SUB-GROUP	$T_A = 25^\circ\text{C}$			SUB-GROUP	$-55^\circ\text{C} \leq T_A \leq 125^\circ\text{C}$			UNITS
			MIN	TYP	MAX		MIN	TYP	MAX	
V_{IN} Minimum Start Voltage (Note 2)		1			7.5	2, 3			7.5	V
V_{IN} UVLO Threshold (Falling)		1	3.6	3.8	4.0	2, 3	3.6	3.8	4.0	V
V_{IN} Supply Current	$V_{CC} > 9\text{V}$	1		130	200	2, 3			800	μA
V_{IN} Shutdown Current	$V_{\text{SHDN}} = 0.3\text{V}$	1		65	100	2, 3			200	μA
BOOST Supply Current (Note 3)		1		1.4	2	2, 3			3.5	mA
V_{CC} Supply Current		1		3.8	4.5	2, 3			5.5	mA
V_{CC} Current Limit		1	-40	-150		2, 3	-40			mA
SHDN Enable Threshold (Rising)		1	1.30	1.35	1.4	2, 3	1.30		1.5	V
SHDN Hysteresis		1		140		2, 3	100		200	mV
Reference Voltage		1	1.222 1.214	1.232	1.244 1.250	2, 3	1.214		1.250	V
V_{FB} Input Bias Current		1		± 20	± 10 ± 150	2, 3		± 20		nA
V_{FB} Error Amp Transconductance		1	350	450		2, 3	340		540	μS
Error Amp Sink/Source Current		1	35	50		2, 3	20			μA
Peak Current Limit Sense Voltage		1	90	105	120	2, 3	85		125	mV
Soft-Start Charge Current		1	8	12	14	2, 3	8		16	μA
Sense Pins Common-Mode Range		1	0		36	2, 3	0		36	V
Sense Pins Input Current	$V_{\text{SENSE(CM)}} > 4\text{V}$	1		320	400	2, 3			500	μA
Reverse Protect Sense Voltage	$V_{\text{MODE}} = 7.5\text{V } V_{CC}$			108	120	2, 3			140	mV
Reverse Current Sense Voltage Offset	$V_{\text{MODE}} = V_{FB}$			15	20	2, 3			25	mV
Switching Frequency	$R_T = 49.9\text{k}$	1	270	300	360	2, 3	240		390	kHz
Programmable Frequency Range		1	100		500	2, 3	100		500	kHz
External Sync Frequency Range		1	100		600	2, 3	100		600	kHz
Non-Overlap Time TG to BG		1		250		2, 3				ns
Non-Overlap Time BG to TG		1		250		2, 3				ns
TG Minimum On-Time		1		400		2, 3				ns
TG Minimum Off-Time		1		300		2, 3				ns
TG, BG Drive On Voltage	$V_{CC} = 10\text{V}$	1	8	8.75		2, 3	8			V
TG, BG Drive Off Voltage		1			0.1	2, 3			0.1	V
TG, BG Drive Rise Time	$C_{TG} = C_{BG} = 3300\text{pF}$	1		45		2, 3				ns
TG, BG Drive Fall Time	$C_{TG} = C_{BG} = 3300\text{pF}$	1		45		2, 3				ns

DICE/~~DWF~~ SPECIFICATION

TABLE 3: ELECTRICAL CHARACTERISTICS (Post-Irradiation) Specifications are at $T_A = 25^\circ\text{C}$, $V_{IN} = 20\text{V}$, $V_{CC} = \text{BOOST} = 10\text{V}$, $\overline{\text{SHDN}} = 2\text{V}$, $R_{SET} = 49.9\text{k}\Omega$, $\text{SENSE}^- = \text{SENSE}^+ = 10\text{V}$, $\text{SGND} = \text{PGND}$, $\text{SW} = 0\text{V}$.

PARAMETER	CONDITIONS	10KRADS (Si)		20KRADS (Si)		50KRADS (Si)		100KRADS (Si)		200KRADS (Si)		UNITS
V_{IN} Minimum Start Voltage (Note 2)		7.5		7.5		7.5		7.5		7.5		V
V_{IN} UVLO Threshold (Falling)		4		4		4		4		4		V
V_{IN} Supply Current	$V_{CC} > 9\text{V}$	200		200		200		200		200		μA
V_{IN} Shutdown Current	$V_{\overline{\text{SHDN}}} = 0.3\text{V}$	100		100		100		100		100		μA
BOOST Supply Current (Note 3)		2		2		2		2		2		mA
V_{CC} Supply Current		4.5		4.5		4.5		4.5		4.5		mA
V_{CC} Current Limit		-40		-40		-40		-40		-40		mA
$\overline{\text{SHDN}}$ Enable Threshold (Rising)		1.30	1.5	1.30	1.5	1.30	1.5	1.30	1.5	1.30	1.5	V
$\overline{\text{SHDN}}$ Hysteresis		100	180	100	180	100	180	100	180	80	180	mV
Reference Voltage		1.222	1.244	1.218	1.244	1.216	1.244	1.212	1.244	1.195	1.244	V
V_{FB} Input Bias Current		± 100	± 150	± 150	± 200	± 170	± 250	± 300	± 350	± 400		nA
V_{FB} Error Amp Transconductance		350		330		300		280		250		μS
Error Amp Sink/Source Current		35		35		35		35		30		μA
Peak Current Limit Sense Voltage		90	120	85	120	85	120	80	120	75	120	mV
Soft-Start Charge Current		8	16	8	16	6	16	5	16	4	16	μA
Sense Pins Common-Mode Range		36		36		36		36		36		V
Sense Pins Input Current	$V_{\text{SENSE(CM)}} > 4\text{V}$	400		400		400		400		400		μA
Reverse Protect Sense Voltage	$V_{\text{MODE}} = 7.5\text{V } V_{CC}$	120		120		120		120		120		mV
Reverse Current Sense Voltage Offset	$V_{\text{MODE}} = V_{FB}$	20		20		20		20		20		mV
Switching Frequency	$R_T = 49.9\text{k}$	270	370	270	370	270	370	270	370	270	370	kHz
Programmable Frequency Range		100	500	100	500	100	500	100	500	100	500	kHz
Non-Overlap Time TG to BG		350		350		350		350		350		ns
Non-Overlap Time BG to TG		350		350		350		350		350		ns
TG Minimum On Time		500		500		500		500		500		ns
TG Minimum Off Time		350		350		350		360		360		ns
TG, BG Drive On Voltage	$V_{CC} = 10\text{V}$	8		8		8		8		8		V
TG, BG Drive Off Voltage		0.1		0.1		0.1		0.1		0.1		V
TG, BG Drive Rise Time	$C_{TG} = C_{BG} = 3300\text{pF}$	60		60		60		60		60		ns
TG, BG Drive Fall Time	$C_{TG} = C_{BG} = 3300\text{pF}$	60		60		60		60		60		ns

Note 1: Stresses beyond those listed under Absolute Maximum Ratings may cause permanent damage to the device. Exposure to any Absolute Maximum Rating condition for extended periods may affect device reliability.

Note 2: V_{IN} voltages below the start-up threshold (7.5V) are only supported when the V_{CC} is externally driven above 6.5V.

Note 3: Supply current specification does not include switch drive currents. Actual supply currents will be higher.

Note 4: Connect the MODE pin to V_{FB} for pulse-skipping mode or V_{CC} for forced continuous mode. Burst Mode operation is not available in the RH3845 version of this part.

TABLE 4: ELECTRICAL TEST REQUIREMENTS

MIL-STD-883 TEST REQUIREMENTS	SUBGROUP
Final Electrical Test Requirements (Method 5004)	1*, 2, 3
Group A Test Requirements (Method 5005)	1, 2, 3
Group B and D for Class S, End Point Electrical Parameters (Method 5005)	1, 2, 3

*PDA applies to subgroup 1. See PDA Test Notes.

PDA Test Notes

The PDA is specified as 5% based on failures from Group A, Subgroup 1, tests after cooldown as the final electrical test in accordance with method 5004 of MIL-STD-883. The verified failures of Group A, Subgroup 1, after burn-in divided by the total number of devices submitted for burn-in in that lot shall be used to determine the percent for the lot.

Linear Technology Corporation reserves the right to test to tighter limits than those given.