INTEGRATED CIRCUITS, SILICON MONOLITHIC, PULSE WIDTH MODULATOR

BASED ON TYPE ST1843

Detail Specification No. 9108/020

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DOCUMENTATION CHANGE NOTICE

(Refer to https://escies.org for ESCC DCR content)

DCR No.	CHANGE DESCRIPTION
1026	Specification updated to incorporate changes per DCR.

TABLE OF CONTENTS

1 GENERAL

1.1 SCOPE

This specification details the ratings, physical and electrical characteristics and test and inspection data for the component type variants and/or the range of components specified below. It supplements the requirements of, and shall be read in conjunction with, the ESCC Generic Specification listed under Applicable Documents.

1.2 APPLICABLE DOCUMENTS

The following documents form part of this specification and shall be read in conjunction with it:

(a) ESCC Generic Specification No. 9000.
(b) MIL-STD-883, Test Methods and Procedures for Microelectronics.

1.3 TERMS, DEFINITIONS, ABBREVIATIONS, SYMBOLS AND UNITS

For the purpose of this specification, the terms, definitions, abbreviations, symbols and units specified in ESCC Basic Specification No. 21300 shall apply.

1.4 THE ESCC COMPONENT NUMBER AND COMPONENT TYPE VARIANTS

1.4.1 The ESCC Component Number

The ESCC Component Number shall be constituted as follows:

Example: 910802001F

- Detail Specification Reference: 9108020
- Component Type Variant Number: 01 (as required)
- Total Dose Radiation Level Letter: F (as required)

1.4.2 Component Type Variants

The component type variants applicable to this specification are as follows:

Variant Number	Based on Type	Case	Terminal Material and Finish	Weight max g	Total Dose Radiation Level Letter
01	ST1843	FP	G2	0.45	F [50krad(Si)]
02	ST1843	FP	G4	0.45	F [50krad(Si)]

The terminal material and finish shall be in accordance with the requirements of ESCC Basic Specification No. 23500.

Total dose radiation level letters are defined in ESCC Basic Specification No. 22900. If an alternative radiation test level is specified in the Purchase Order the letter shall be changed accordingly.

1.5 MAXIMUM RATINGS

The maximum ratings shall not be exceeded at any time during use or storage.

Maximum ratings shall only be exceeded during testing to the extent specified in this specification and when stipulated in Test Methods and Procedures of the ESCC Generic Specification.

Characteristics	Symbols	Maximum Ratings	Units	Remarks
Supply Voltage (low impedance source)	V_i	30	V	Note 1
Supply Current	I_i	30	mA	Notes 1, 2
Output Current	I_O	±1	A	Note 1
Output Energy (capacitive load)	E_O	5	µJ	
Analogue Inputs	-	-0.3 to 5.5	V	Pins 2, 3
Error Amplifier Output Sink Current	$I_{O\text{-SINK}}$	10	mA	Note 1
Operating Temperature Range	T_{op}	-55 to +125	°C	T_{amb}
Storage Temperature Range	T_{stg}	-65 to +150	°C	
Junction Temperature	T_j	+150	°C	
Soldering Temperature	T_{sol}	+265	°C	Note 3

NOTES:

1. All voltages are with respect to Ground, all currents are positive into the specified terminal.
2. Supply voltage is self-limited by Zener clamp.
3. Duration 10 seconds maximum at a distance of not less than 1.5mm from the device body and the same terminal shall not be resoldered until 3 minutes have elapsed.

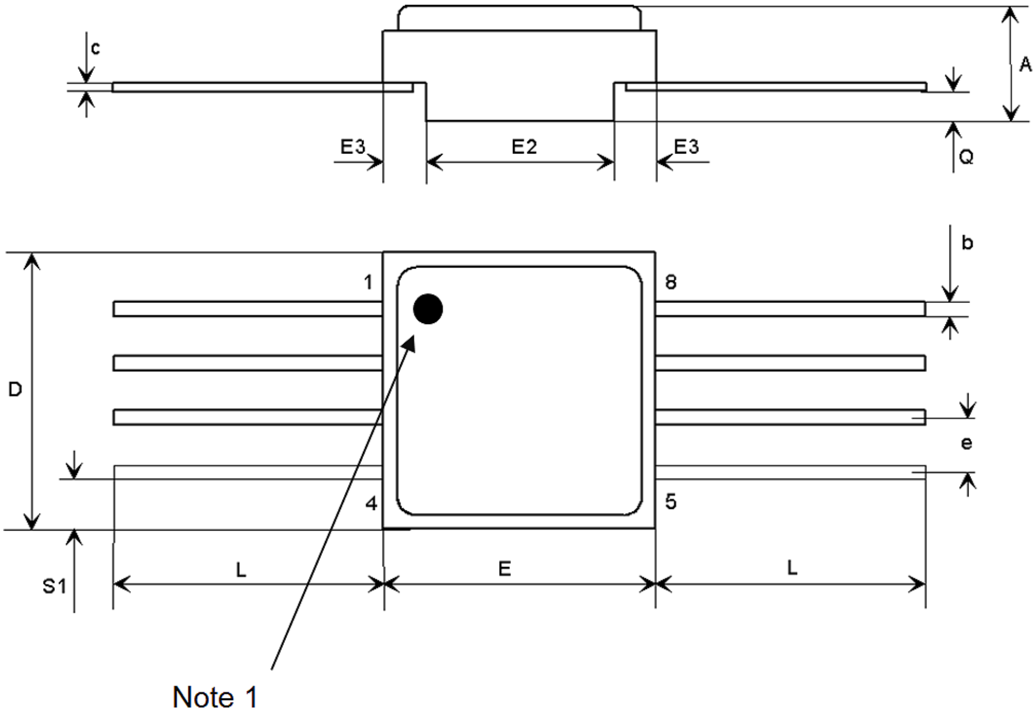
1.6 HANDLING PRECAUTIONS

These devices are susceptible to damage by electrostatic discharge. Therefore, suitable precautions shall be employed for protection during all phases of manufacture, testing, packaging, shipment and any handling.

These components are categorised as Class 2 per ESCC Basic Specification No. 23800 with a Minimum Critical Path Failure Voltage of 2000 Volts.

1.7 PHYSICAL DIMENSIONS AND TERMINAL IDENTIFICATION

Flat Package (FP) - 8 Pin



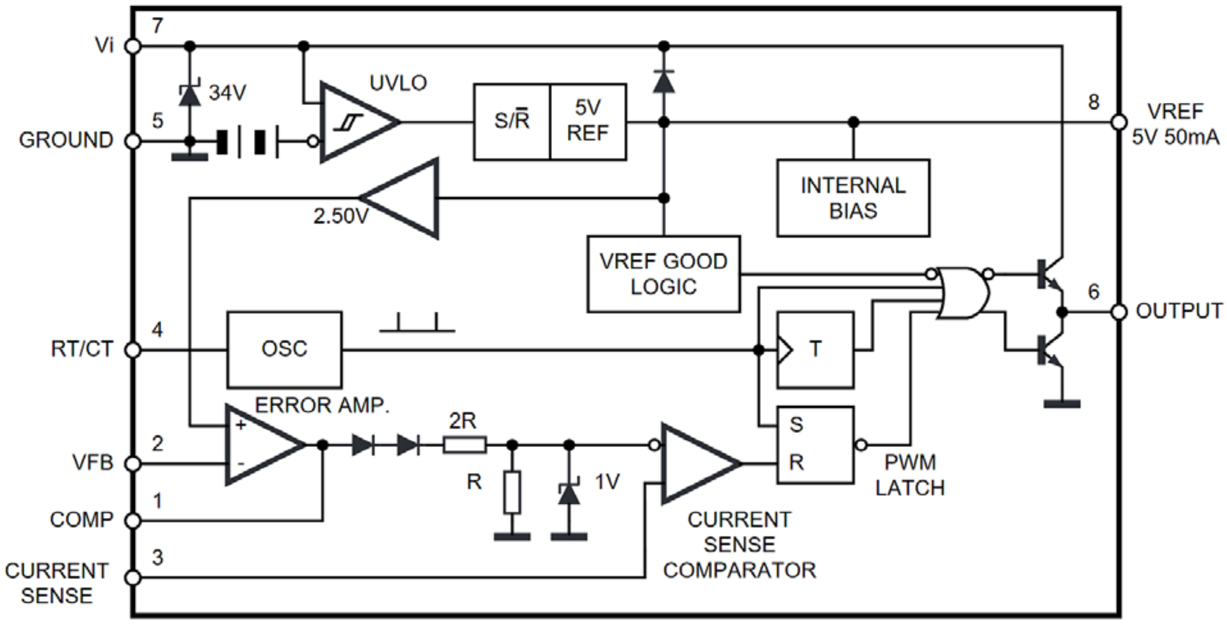
Symbols	Dimensions mm		Notes
	Min	Max	
A	2.24	2.64	
b	0.38	0.48	2
c	0.1	0.16	2
D	6.35	6.61	
E	6.35	6.61	
E2	4.32	4.58	
E3	0.88	1.14	
e	1.27 BSC		3
L	6.51	7.38	2
Q	0.66	0.92	
S1	0.92	1.32	4

NOTES:

1. Terminal identification shall be by means of a notch or a dot located adjacent to Pin 1.
2. Applies to all pins.
3. 6 places.
4. 4 places.

1.8 FUNCTIONAL DIAGRAM

Note: For the ST1843 the toggle flip-flop is unused.



1.9 PIN ASSIGNMENT

Pin	Name	Description
1	COMP	This pin is the Error Amplifier output and is made available for loop compensation.
2	V_{FB}	This is the inverting input of the Error Amplifier. It is normally connected to the switching power supply output through a resistor divider.
3	I_{SENSE}	A voltage proportional to inductor current is connected to this input. The PWM uses this information to terminate the output switch conduction.
4	R_T/C_T	The oscillator frequency and maximum Output duty cycle are programmed by connecting resistor R_T to V_{ref} and capacitor C_T to ground. Operation to 500kHz is possible.
5	GROUND	This pin is the combined control circuitry and power ground.
6	OUTPUT	This output directly drives the gate of a power MOSFET. Peak currents up to 1A are sourced and sunk by this pin.
7	V_i	This pin is the positive supply of the control IC.
8	V_{ref}	This is the reference output. It provides charging current for capacitor C_T through resistor R_T.

2 REQUIREMENTS

2.1 GENERAL

The complete requirements for procurement of the components specified herein are as stated in this specification and the ESCC Generic Specification. Permitted deviations from the Generic Specification, applicable to this specification only, are listed below.

Permitted deviations from the Generic Specification and this Detail Specification, formally agreed with specific Manufacturers on the basis that the alternative requirements are equivalent to the ESCC requirement and do not affect the component's reliability, are listed in the appendices attached to this specification.

2.1.1 Deviations from the Generic Specification

None.

2.2 MARKING

The marking shall be in accordance with the requirements of ESCC Basic Specification No. 21700 and as follows.

The information to be marked on the component shall be:

(a) Terminal identification.
(b) The ESCC qualified components symbol (for ESCC qualified components only).
(c) The ESCC Component Number.
(d) Traceability information.

2.3 ELECTRICAL MEASUREMENTS AT ROOM, HIGH AND LOW TEMPERATURES

Electrical measurements shall be performed at room, high and low temperatures. Consolidated Notes are given after the tables.

2.3.1 Room Temperature Electrical Measurements

The measurements shall be performed at T_{amb} = +22 ±3°C.

Characteristics	Symbols	MIL-STD-883 Test Method	Test Conditions	Limits		Units
				Min	Max	
REFERENCE SECTION						
Output Voltage	V_{REF}	-	$V_i = 15V$ $R_T = 10k\Omega$, $C_T = 3.3nF$ $I_O = 1mA$	4.95	5.05	V
Line regulation	ΔV_{REF_LINE}	-	$12V \le V_i \le 25V$ $R_T = 10k\Omega$, $C_T = 3.3nF$	-	20	mV
Load Regulation	ΔV_{REF_LOAD}	-	$V_i = 15V$ $R_T = 10k\Omega$, $C_T = 3.3nF$ $1mA \le I_O \le 20mA$	-	19	mV
Output Short Circuit Current	I_{SC}	3011	$V_i = 15V$ $R_T = 10k\Omega$, $C_T = 3.3nF$	-180	-30	mA

Characteristics	Symbols	MIL-STD-883 Test Method	Test Conditions	Limits		Units
				Min	Max	
OSCILLATOR SECTION						
Frequency	f_{OSC}	-	$V_i = 15V$ $R_T = 10k\Omega$, $C_T = 3.3nF$	49	55	kHz
Frequency Change with Voltage	$\Delta f_{OSC}/\Delta V$	-	$12V \leq V_i \leq 25V$ $R_T = 10k\Omega$, $C_T = 3.3nF$	-1	1	%
Discharge Current	I_{DISCHG}	-	$V_i = 15V$ $R_T = 10k\Omega$, $C_T = 3.3nF$ $V_{OSC} = 2V$	8.1	8.8	mA
ERROR AMP SECTION						
Input Voltage	V_2	-	$V_i = 15V$ $R_T = 10k\Omega$, $C_T = 3.3nF$ $V_{PIN1} = 2.5V$	2.45	2.55	V
Input Bias Current	I_b	4001	$V_i = 15V$ $R_T = 10k\Omega$, $C_T = 3.3nF$ $V_{FB} = 5V$	-1	1	µA
Open Loop Voltage Gain	A_{VOL}	-	$V_i = 15V$ $R_T = 10k\Omega$, $C_T = 3.3nF$ $2V \leq V_O \leq 4V$	65	-	dB
Power Supply Rejection Ratio	PSRR	4003	$12V \leq V_i \leq 25V$ $R_T = 10k\Omega$, $C_T = 3.3nF$	67	-	dB
Output Sink Current	I_{O_SINK}	-	$V_i = 15V$ $R_T = 10k\Omega$, $C_T = 3.3nF$ $V_{PIN2} = 2.7V$ $V_{PIN1} = 1.1V$	6	-	mA
Output Source Current	I_{O_SOURCE}	-	$V_i = 15V$ $R_T = 10k\Omega$, $C_T = 3.3nF$ $V_{PIN2} = 2.3V$ $V_{PIN1} = 5V$	-	-1	mA
V_{OUT} High	V_{OH}	-	$V_i = 15V$ $R_T = 10k\Omega$, $C_T = 3.3nF$ $V_{PIN2} = 2.3V$ $R_L = 15k\Omega$ to GROUND	6.2	-	V
V_{OUT} Low	V_{OL}	-	$V_i = 15V$ $R_T = 10k\Omega$, $C_T = 3.3nF$ $V_{PIN2} = 2.3V$ $R_L = 15k\Omega$ to V_{ref}	-	950	mV

Characteristics	Symbols	MIL-STD-883 Test Method	Test Conditions	Limits		Units
				Min	Max	
CURRENT SENSE SECTION						
Gain	G_V	4004	V_i = 15V R_T = 10kΩ, C_T = 3.3nF Notes 1, 2	2.85	3.15	V/V
Maximum Input Signal	V_3	-	V_i = 15V R_T = 10kΩ, C_T = 3.3nF V_{PIN1} = 2.3V Note 1	0.9	1.05	V
Supply Voltage Rejection	SVR	-	$12V \leq V_i \leq 25V$ R_T = 10kΩ, C_T = 3.3nF Note 1	74	-	dB
Input Bias Current	I_b	4001	V_i = 15V R_T = 10kΩ, C_T = 3.3nF	-10	10	µA
Delay to output	d_o	3003	V_i = 15V R_T = 10kΩ, C_T = 3.3nF	-	300	ns
OUTPUT SECTION						
Output Low Level	V_{OL1}	3007	V_i = 15V R_T = 10kΩ, C_T = 3.3nF I_{SINK} = 20mA	-	260	mV
Output Low Level	V_{OL2}	3007	V_i = 15V R_T = 10kΩ, C_T = 3.3nF I_{SINK} = 200mA	-	2.2	V
Output High level	V_{OH1}	3006	V_i = 15V R_T = 10kΩ, C_T = 3.3nF I_{SOURCE} = 20mA	13	-	V
Output High Level	V_{OH2}	3006	V_i = 15V R_T = 10kΩ, C_T = 3.3nF I_{SOURCE} = 200mA	12	-	V
UVLO Saturation	V_{OLS}	-	V_i = 6V R_T = 10kΩ, C_T = 3.3nF I_{SINK} = 1mA	-	1.1	V
Rise Time	t_r	3004	V_i = 15V R_T = 10kΩ, C_T = 3.3nF C_L = 1nF	-	150	ns
Fall Time	t_f	3004	V_i = 15V R_T = 10kΩ, C_T = 3.3nF C_L = 1nF	-	150	ns

Characteristics	Symbols	MIL-STD-883 Test Method	Test Conditions	Limits		Units
				Min	Max	
UNDER-VOLTAGE LOCKOUT SECTION						
Start Threshold	V_{TH}	-	V_i = 15V R_T = 10kΩ, C_T = 3.3nF	7.8	9	V
Min Operating Voltage after Turn-on	V_{MIN}	-	V_i = 15V R_T = 10kΩ, C_T = 3.3nF	7	8.2	V
Max Duty Cycle	DC_{MAX}	-	V_i = 15V R_T = 10kΩ, C_T = 3.3nF	94	100	%
Min Duty Cycle	DC_{MIN}	-	V_i = 15V R_T = 10kΩ, C_T = 3.3nF	-	0	%
TOTAL STAND-BY CURRENT						
Start-up current	I_{ST}	-	V_i = 6.5V R_T = 10kΩ, C_T = 3.3nF	-	500	µA
Operating Supply Current	I_i	3005	V_i = 15V R_T = 10kΩ, C_T = 3.3nF V_{PIN2} = V_{PIN3} = 0V	-	17	mA
Zener Voltage	V_{iz}	-	V_i = 15V R_T = 10kΩ, C_T = 3.3nF I_i = 25mA	30	-	V

2.3.2 High and Low Temperatures Electrical Measurements

The measurements shall be performed at T_{amb} = +125 (+0 -5)°C and T_{amb} = -55 (+5 -0)°C.

Characteristics	Symbols	MIL-STD-883 Test Method	Test Conditions	Limits		Units
				Min	Max	
REFERENCE SECTION						
Output Voltage	V_{REF}	-	V_i = 15V R_T = 10kΩ, C_T = 3.3nF I_O = 1mA	4.9	5.05	V
Line regulation	ΔV_{REF_LINE}	-	12V ≤ V_i ≤ 25V R_T = 10kΩ, C_T = 3.3nF	-	220	mV
Load Regulation	ΔV_{REF_LOAD}	-	V_i = 15V R_T = 10kΩ, C_T = 3.3nF 1mA ≤ I_O ≤ 20mA	-	25	mV
Output Short Circuit Current	I_{SC}	3011	V_i = 15V R_T = 10kΩ, C_T = 3.3nF	-180	-30	mA
OSCILLATOR SECTION						
Frequency	f_{OSC}	-	V_i = 15V R_T = 10kΩ, C_T = 3.3nF	49	56	kHz
Frequency Change with Voltage	$\Delta f_{OSC}/\Delta V$	-	12V ≤ V_i ≤ 25V R_T = 10kΩ, C_T = 3.3nF	-5	5	%
Discharge Current	I_{DISCHG}	-	V_i = 15V R_T = 10kΩ, C_T = 3.3nF V_{OSC} = 2V	7.2	8.8	mA

Characteristics	Symbols	MIL-STD-883 Test Method	Test Conditions	Limits		Units
				Min	Max	
ERROR AMP SECTION						
Input Voltage	V_2	-	V_i = 15V R_T = 10kΩ, C_T = 3.3nF V_{PIN1} = 2.5V	2.4	2.55	V
Input Bias Current	I_b	4001	V_i = 15V R_T = 10kΩ, C_T = 3.3nF V_{FB} = 5V	-1	1	µA
Open Loop Voltage Gain	A_{VOL}	-	V_i = 15V R_T = 10kΩ, C_T = 3.3nF $2V \le V_O \le 4V$	65	-	dB
Power Supply Rejection Ratio	PSRR	4003	$12V \le V_i \le 25V$ R_T = 10kΩ, C_T = 3.3nF	50	-	dB
Output Sink Current	I_{O_SINK}	-	V_i = 15V R_T = 10kΩ, C_T = 3.3nF V_{PIN2} = 2.7V V_{PIN1} = 1.1V	2	-	mA
Output Source Current	I_{O_SOURCE}	-	V_i = 15V R_T = 10kΩ, C_T = 3.3nF V_{PIN2} = 2.3V V_{PIN1} = 5V	-	-500	µA
V_{OUT} High	V_{OH}	-	V_i = 15V R_T = 10kΩ, C_T = 3.3nF V_{PIN2} = 2.3V R_L = 15kΩ to GROUND	5	-	V
V_{OUT} Low	V_{OL}	-	V_i = 15V R_T = 10kΩ, C_T = 3.3nF V_{PIN2} = 2.3V R_L = 15kΩ to V_{ref}	-	1.1	V
CURRENT SENSE SECTION						
Gain	G_V	4004	V_i = 15V R_T = 10kΩ, C_T = 3.3nF Notes 1, 2	2.85	3.15	V/V
Maximum Input Signal	V_3	-	V_i = 15V R_T = 10kΩ, C_T = 3.3nF V_{PIN1} = 2.3V Note 1	0.9	1.1	V
Supply Voltage Rejection	SVR	-	$12V \le V_i \le 25V$ R_T = 10kΩ, C_T = 3.3nF Note 1	50	-	dB
Input Bias Current	I_b	4001	V_i = 15V R_T = 10kΩ, C_T = 3.3nF	-10	10	µA
Delay to output	d_o	3003	V_i = 15V R_T = 10kΩ, C_T = 3.3nF	-	300	ns

Characteristics	Symbols	MIL-STD-883 Test Method	Test Conditions	Limits		Units
				Min	Max	
OUTPUT SECTION						
Output Low Level	V_{OL1}	3007	$V_i = 15V$ $R_T = 10k\Omega$, $C_T = 3.3nF$ $I_{SINK} = 20mA$	-	400	mV
Output Low Level	V_{OL2}	3007	$V_i = 15V$ $R_T = 10k\Omega$, $C_T = 3.3nF$ $I_{SINK} = 200mA$	-	2.2	V
Output High level	V_{OH1}	3006	$V_i = 15V$ $R_T = 10k\Omega$, $C_T = 3.3nF$ $I_{SOURCE} = 20mA$	13	-	V
Output High Level	V_{OH2}	3006	$V_i = 15V$ $R_T = 10k\Omega$, $C_T = 3.3nF$ $I_{SOURCE} = 200mA$	12	-	V
UVLO Saturation	V_{OLS}	-	$V_i = 6V$ $R_T = 10k\Omega$, $C_T = 3.3nF$ $I_{SINK} = 1mA$	-	1.1	V
Rise Time	t_r	3004	$V_i = 15V$ $R_T = 10k\Omega$, $C_T = 3.3nF$ $C_L = 1nF$	-	150	ns
Fall Time	t_f	3004	$V_i = 15V$ $R_T = 10k\Omega$, $C_T = 3.3nF$ $C_L = 1nF$	-	150	ns
UNDER-VOLTAGE LOCKOUT SECTION						
Start Threshold	V_{TH}	-	$V_i = 15V$ $R_T = 10k\Omega$, $C_T = 3.3nF$	7.8	9	V
Min Operating Voltage after Turn-on	V_{MIN}	-	$V_i = 15V$ $R_T = 10k\Omega$, $C_T = 3.3nF$	7	8.2	V
Max Duty Cycle	DC_{MAX}	-	$V_i = 15V$ $R_T = 10k\Omega$, $C_T = 3.3nF$	94	100	%
Min Duty Cycle	DC_{MIN}	-	$V_i = 15V$ $R_T = 10k\Omega$, $C_T = 3.3nF$	-	0	%
TOTAL STAND-BY CURRENT						
Start-up current	I_{ST}	-	$V_i = 6.5V$ $R_T = 10k\Omega$, $C_T = 3.3nF$	-	500	µA
Operating Supply Current	I_i	3005	$V_i = 15V$ $R_T = 10k\Omega$, $C_T = 3.3nF$ $V_{PIN2} = V_{PIN3} = 0V$	-	17	mA
Zener Voltage	V_{iz}	-	$V_i = 15V$ $R_T = 10k\Omega$, $C_T = 3.3nF$ $I_i = 25mA$	30	-	V

2.3.3 Notes to Electrical Measurement Tables

1. This parameter shall be measured at trip point of latch with $V_{PIN2} = 0V$.
2. The gain, A, is defined as follows:

$$A = \frac{\Delta V_{PIN1}}{\Delta V_{PIN3}}\ .\ 0V \leq V_{PIN3} \leq 0.8V.$$

2.4 PARAMETER DRIFT VALUES

Unless otherwise specified, the measurements shall be performed at $T_{amb} = +22 \pm 3°C$.

The test methods and test conditions shall be as per the corresponding test defined in Room Temperature Electrical Measurements.

The drift values (Δ) shall not be exceeded for each characteristic specified. The corresponding absolute limit values for each characteristic shall not be exceeded.

Characteristics	Symbols	Limits			Units
		Drift Value Δ	Absolute		
			Min	Max	
Operating Supply Current	I_i	±0.25	-	17	mA
Output Voltage	V_{REF}	±0.025	4.95	5.05	V
Output Low Level	V_{OL2}	±0.05	-	2.2	V
Output High Level	V_{OH2}	±0.05	12	-	V

2.5 INTERMEDIATE AND END-POINT ELECTRICAL MEASUREMENTS

Unless otherwise specified, the measurements shall be performed at $T_{amb} = +22 \pm 3°C$.

The test methods and test conditions shall be as per the corresponding test defined in Room Temperature Electrical Measurements.

The drift values (Δ) shall not be exceeded for each characteristic where specified. The corresponding absolute limit values for each characteristic shall not be exceeded.

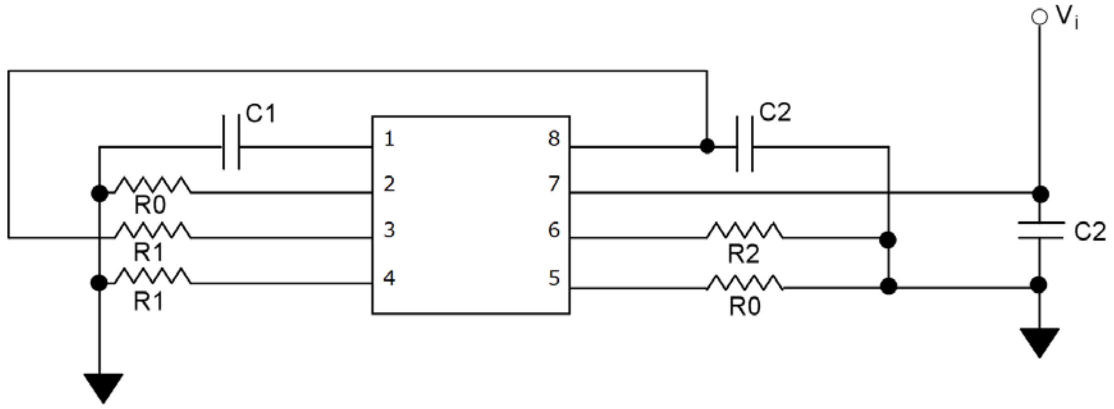
Characteristics	Symbols	Limits			Units
		Drift Value Δ	Absolute		
			Min	Max	
Operating Supply Current	I_i	±0.25	-	17	mA
Output Voltage	V_{REF}	±0.025	4.95	5.05	V
Output Low Level	V_{OL2}	±0.05	-	2.2	V
Output High Level	V_{OH2}	±0.05	12	-	V

2.6 HIGH TEMPERATURE REVERSE BIAS BURN-IN CONDITIONS

Characteristics	Symbols	Test Conditions	Units
Ambient Temperature	T_{amb}	+100 (+0 -5)	°C
Supply Voltage	V_i	30	V
Junction Temperature	T_j	+150 (+0 -5)	°C
Duration	t	≥ 168	Hours

NOTES:

1. High Temperature Reverse Bias Burn-in may be carried out using the following test circuit:



R0 = 0Ω
R1 = 10kΩ
R2 = 1kΩ

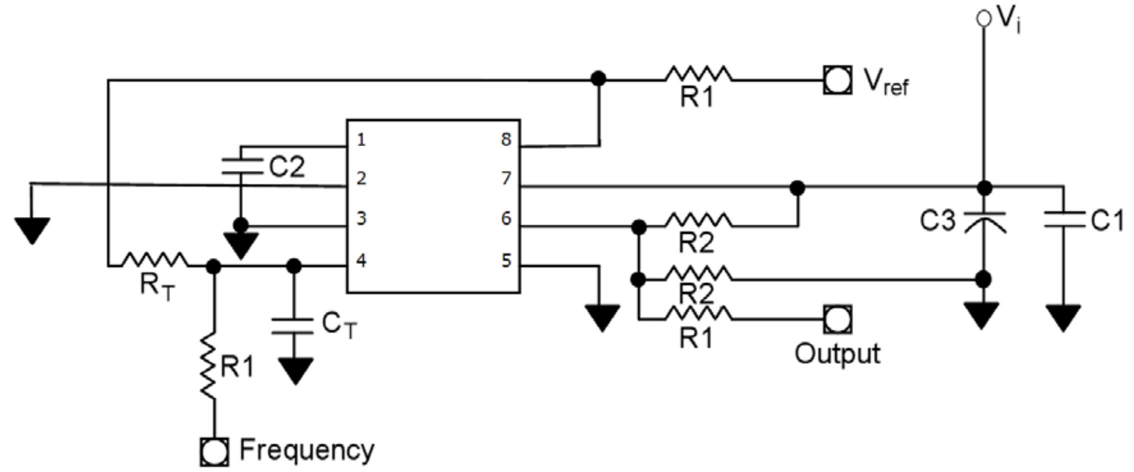
C1 = 1nF
C2 = 100nF

2.7 POWER BURN-IN CONDITIONS

Characteristics	Symbols	Test Conditions	Units
Ambient Temperature	T_{amb}	+125 (+0 -5)	°C
Supply Voltage	V_i	18	V
Frequency	f	350	kHz
Junction Temperature	T_j	+150 (+0 -5)	°C

NOTES:

1. Power Burn-in may be carried out using the following test circuit:



R_T = 10kΩ
C_T = 470pF
R1 = 1kΩ
C1 = 100nF
R2 = 100kΩ
C2 = 1µF
C3 = 470µF

2.8 OPERATING LIFE CONDITIONS

The conditions shall be as specified for Power Burn-in.

2.9 TOTAL DOSE RADIATION TESTING

2.9.1 Bias Conditions and Total Dose Level for Total Dose Radiation Testing

Irradiation testing shall be carried out at Dose Rate Window 2 ("Low Rate"): 36 to 360 rad hr^{-1}.

No bias shall be applied during irradiation testing (all pins connected to Ground).

The total dose level applied shall be as specified in the component type variant information herein or in the Purchase Order.

2.9.2 Electrical Measurements for Total Dose Radiation Testing

Prior to irradiation testing the devices shall have successfully met Room Temperature Electrical Measurements specified herein.

Unless otherwise stated the measurements shall be performed at T_{amb} = +22 ±3°C.

The test methods and test conditions shall be as per the corresponding test defined in Room Temperature Electrical Measurements.

The parameters to be measured during and on completion of irradiation testing are shown below.

Characteristics	Symbols	MIL-STD-883 Test Method	Test Conditions	Limits		Units
				Min	Max	
REFERENCE SECTION						
Output Voltage	V_{REF}	-	$V_i = 15V$ $R_T = 10k\Omega$, $C_T = 3.3nF$ $I_O = 1mA$	4.85	5.15	V
Line regulation	ΔV_{REF_LINE}	-	$12V \le V_i \le 25V$ $R_T = 10k\Omega$, $C_T = 3.3nF$	-	20	mV
Load Regulation	ΔV_{REF_LOAD}	-	$V_i = 15V$ $R_T = 10k\Omega$, $C_T = 3.3nF$ $1mA \le I_O \le 20mA$	-	25	mV
Output Short Circuit Current	I_{SC}	3011	$V_i = 15V$ $R_T = 10k\Omega$, $C_T = 3.3nF$	-180	-30	mA
OSCILLATOR SECTION						
Frequency	f_{OSC}	-	$V_i = 15V$ $R_T = 10k\Omega$, $C_T = 3.3nF$	49	65	kHz
Frequency Change with Voltage	$\Delta f_{OSC}/\Delta V$	-	$12V \le V_i \le 25V$ $R_T = 10k\Omega$, $C_T = 3.3nF$	-1	1	%
Discharge Current	I_{DISCHG}	-	$V_i = 15V$ $R_T = 10k\Omega$, $C_T = 3.3nF$ $V_{OSC} = 2V$	7.8	8.8	mA

Characteristics	Symbols	MIL-STD-883 Test Method	Test Conditions	Limits		Units
				Min	Max	
ERROR AMP SECTION						
Input Voltage	V_2	-	$V_i = 15V$ $R_T = 10k\Omega$, $C_T = 3.3nF$ $V_{PIN1} = 2.5V$	2.45	2.6	V
Input Bias Current	I_b	4001	$V_i = 15V$ $R_T = 10k\Omega$, $C_T = 3.3nF$ $V_{FB} = 5V$	-2.75	2.75	µA
Open Loop Voltage Gain	A_{VOL}	-	$V_i = 15V$ $R_T = 10k\Omega$, $C_T = 3.3nF$ $2V \leq V_O \leq 4V$	60	-	dB
Power Supply Rejection Ratio	PSRR	4003	$12V \leq V_i \leq 25V$ $R_T = 10k\Omega$, $C_T = 3.3nF$	60	-	dB
Output Sink Current	I_{O_SINK}	-	$V_i = 15V$ $R_T = 10k\Omega$, $C_T = 3.3nF$ $V_{PIN2} = 2.7V$ $V_{PIN1} = 1.1V$	2	-	mA
Output Source Current	I_{O_SOURCE}	-	$V_i = 15V$ $R_T = 10k\Omega$, $C_T = 3.3nF$ $V_{PIN2} = 2.3V$ $V_{PIN1} = 5V$	-	-500	µA
V_{OUT} High	V_{OH}	-	$V_i = 15V$ $R_T = 10k\Omega$, $C_T = 3.3nF$ $V_{PIN2} = 2.3V$ $R_L = 15k\Omega$ to GROUND	5	-	V
V_{OUT} Low	V_{OL}	-	$V_i = 15V$ $R_T = 10k\Omega$, $C_T = 3.3nF$ $V_{PIN2} = 2.3V$ $R_L = 15k\Omega$ to V_{ref}	-	1.1	V
CURRENT SENSE SECTION						
Gain	G_V	4004	$V_i = 15V$ $R_T = 10k\Omega$, $C_T = 3.3nF$ Notes 1, 2	2.85	3.15	V/V
Maximum Input Signal	V_3	-	$V_i = 15V$ $R_T = 10k\Omega$, $C_T = 3.3nF$ $V_{PIN1} = 2.3V$ Note 1	0.9	1.1	V
Supply Voltage Rejection	SVR	-	$12V \leq V_i \leq 25V$ $R_T = 10k\Omega$, $C_T = 3.3nF$ Note 1	60	-	dB
Input Bias Current	I_b	4001	$V_i = 15V$ $R_T = 10k\Omega$, $C_T = 3.3nF$	-50	50	µA
Delay to output	d_o	3003	$V_i = 15V$ $R_T = 10k\Omega$, $C_T = 3.3nF$	-	300	ns

Characteristics	Symbols	MIL-STD-883 Test Method	Test Conditions	Limits		Units
				Min	Max	
OUTPUT SECTION						
Output Low Level	V_{OL1}	3007	$V_i = 15V$ $R_T = 10k\Omega$, $C_T = 3.3nF$ $I_{SINK} = 20mA$	-	400	mV
Output Low Level	V_{OL2}	3007	$V_i = 15V$ $R_T = 10k\Omega$, $C_T = 3.3nF$ $I_{SINK} = 200mA$	-	2.2	V
Output High level	V_{OH1}	3006	$V_i = 15V$ $R_T = 10k\Omega$, $C_T = 3.3nF$ $I_{SOURCE} = 20mA$	13	-	V
Output High Level	V_{OH2}	3006	$V_i = 15V$ $R_T = 10k\Omega$, $C_T = 3.3nF$ $I_{SOURCE} = 200mA$	12	-	V
UVLO Saturation	V_{OLS}	-	$V_i = 6V$ $R_T = 10k\Omega$, $C_T = 3.3nF$ $I_{SINK} = 1mA$	-	1.1	V
Rise Time	t_r	3004	$V_i = 15V$ $R_T = 10k\Omega$, $C_T = 3.3nF$ $C_L = 1nF$	-	180	ns
Fall Time	t_f	3004	$V_i = 15V$ $R_T = 10k\Omega$, $C_T = 3.3nF$ $C_L = 1nF$	-	180	ns
UNDER-VOLTAGE LOCKOUT SECTION						
Start Threshold	V_{TH}	-	$V_i = 15V$ $R_T = 10k\Omega$, $C_T = 3.3nF$	7.8	9.5	V
Min Operating Voltage after Turn-on	V_{MIN}	-	$V_i = 15V$ $R_T = 10k\Omega$, $C_T = 3.3nF$	7	8.6	V
Max Duty Cycle	DC_{MAX}	-	$V_i = 15V$ $R_T = 10k\Omega$, $C_T = 3.3nF$	94	100	%
Min Duty Cycle	DC_{MIN}	-	$V_i = 15V$ $R_T = 10k\Omega$, $C_T = 3.3nF$	-	0	%
TOTAL STAND-BY CURRENT						
Start-up current	I_{ST}	-	$V_i = 6.5V$ $R_T = 10k\Omega$, $C_T = 3.3nF$	-	500	µA
Operating Supply Current	I_i	3005	$V_i = 15V$ $R_T = 10k\Omega$, $C_T = 3.3nF$ $V_{PIN2} = V_{PIN3} = 0V$	-	17	mA
Zener Voltage	V_{iz}	-	$V_i = 15V$ $R_T = 10k\Omega$, $C_T = 3.3nF$ $I_i = 25mA$	30	-	V

APPENDIX ‘A’

AGREED DEVIATIONS FOR STMICROELECTRONICS (F)

ITEMS AFFECTED	DESCRIPTION OF DEVIATIONS
Deviations from Screening Tests - Chart F3	External Visual Inspection: The criteria applicable to chip-outs are those described in MIL-STD-883, Test Method 2009, Paras 3.3.6(b) and 3.3.7(a).
Deviations from Qualification and Periodic Tests - Chart F4	External Visual Inspection: The criteria applicable to chip-outs are those described in MIL-STD-883, Test Method 2009, Paras 3.3.6(b) and 3.3.7(a). Operating Life: The temperature limits of MIL-STD-883, Para. 4.5.8(c) may be used.