

ABSOLUTE MAXIMUM RATINGS (Note 1)

Input Voltage (+V _{IN})	42V
Collector Voltage	60V
Logic Inputs	-0.3V to 5.5V
Current Limit Sense Inputs	-0.3V to V _{IN}
Output Current (each transistor)	200mA
Reference Load Current	50mA

Note 1. Values beyond which damage may occur.

Oscillator Charging Current	5mA
Operating Junction Temperature	
Hermetic (J, L Packages)	150°C
Plastic (N, DW Packages)	150°C
Storage Temperature Range	-65°C to 150°C
Lead Temperature (Soldering, 10 seconds)	300°C
RoHS Peak Package Solder Reflow Temp. (40 sec. max. exp.)	260°C(+0, -5)

THERMAL DATA

J Package:

Thermal Resistance-Junction to Case, θ_{JC}	30°C/W
Thermal Resistance-Junction to Ambient, θ_{JA}	80°C/W

N Package:

Thermal Resistance-Junction to Case, θ_{JC}	40°C/W
Thermal Resistance-Junction to Ambient, θ_{JA}	65°C/W

DW Package:

Thermal Resistance-Junction to Case, θ_{JC}	40°C/W
Thermal Resistance-Junction to Ambient, θ_{JA}	95°C/W

L Package:

Thermal Resistance-Junction to Case, θ_{JC}	35°C/W
Thermal Resistance-Junction to Ambient, θ_{JA}	120°C/W

Note A. Junction Temperature Calculation: $T_J = T_A + (P_D \times \theta_{JA})$.

Note B. The above numbers for θ_{JC} are maximums for the limiting thermal resistance of the package in a standard mounting configuration. The θ_{JA} numbers are meant to be guidelines for the thermal performance of the device/pc-board system. All of the above assume no ambient airflow.

RECOMMENDED OPERATING CONDITIONS (Note 2)

Input Voltage (+V _{IN})	7V to 40V
Collector Voltage	0V to 60V
Error Amp Common Mode Range	2.3V to V _{REF}
Current Limit Sense Common Mode Range	0V to V _{IN} -2.5V
Output Current (each transistor)	0 to 100mA
Reference Load Current	0 to 20mA
Oscillator Charging Current	25µA to 1.8mA

Note 2: Range over which the device is functional.

Oscillator Frequency Range	100Hz to 400KHz
Oscillator Timing Resistor (R _T)	2KΩ to 150KΩ
Oscillator Timing Capacitor (C _T)	1nF to 0.1µF
Operating Ambient Temperature Range	
SG1524B	-55°C to 125°C
SG2524B	-25°C to 85°C
SG3524B	0°C to 70°C

ELECTRICAL CHARACTERISTICS

(Unless otherwise specified, these specifications apply over the operating ambient temperatures for SG1524B with -55°C ≤ T_A ≤ 125°C, SG2524B with -25°C ≤ T_A ≤ 85°C, SG3524B with 0°C ≤ T_A ≤ 70°C, and +V_{IN} = 20V. Low duty cycle pulse testing techniques are used which maintains junction and case temperatures equal to the ambient temperature.)

Parameter	Test Conditions	SG1524B/2524B			SG3524B			Units
		Min.	Typ.	Max.	Min.	Typ.	Max.	
Reference Section (Note 3)								
Output Voltage	T _J = 25°C	4.95	5.00	5.05	4.90	5.00	5.10	V
Line Regulation	V _{IN} = 7V to 40V		3	20		3	30	mV
Load Regulation	I _L = 0 to 20mA		5	30		5	50	mV
Temperature Stability (Note 7)	Over Operating Temperature Range		15	50		15	50	mV
Total Output Voltage Range	Over Line, Load and Temperature	4.90		5.10	4.80		5.20	V
Short Circuit Current	V _{REF} = 0V	25	50	120	25	50	120	mA
Undervoltage Lockout Section								
Threshold Voltage		4.3	4.5	4.7	4.2	4.5	4.9	V

Note 3. I_L = 0mA

ELECTRICAL CHARACTERISTICS (continued)

Parameter	Test Conditions	SG1524B/2524B			SG3524B			Units
		Min.	Typ.	Max.	Min.	Typ.	Max.	
Oscillator Section (Note 4)								
Initial Accuracy	T _J = 25°C	42	45	48	40	45	50	KHz
Voltage Stability	V _{IN} = 7V to 40V		0.1	1		0.1	1	%
Temperature Stability (Note 7)	Over Operating Range		1	2		1	2	%
Minimum Frequency (Note 7)	R _T = 150KΩ, C _T = 0.1μF		50	140		50	120	Hz
Maximum Frequency	R _T = 2KΩ, C _T = 470pF	400	600		400	600		KHz
Sawtooth Peak Voltage	V _{IN} = 40V		3.5	3.9		3.5	3.9	V
Sawtooth Valley Voltage	V _{IN} = 7V	0.6	1		0.6	1		V
Clock Amplitude		3.0	4.0		3.0	4.0		V
Clock Pulse Width		0.2	0.5	1.2	0.2	0.5	1.2	μs
Error Amplifier Section (Note 5)								
Input Offset Voltage	R _S ≤ 2KΩ		0.5	5		2	10	mV
Input Bias Current			1	5		1	10	μA
Input Offset Current				1			1	μA
DC Open Loop Gain	R _L ≥10MΩ	60	78		60	78		dB
Output Low Level	I _{SINK} = 100μA; V _{PIN 1} - V _{PIN 2} ≥ 150mV		0.2	0.5		0.2	0.5	V
Output High Level	I _{SOURCE} = 100μA; V _{PIN 2} - V _{PIN 1} ≥ 150mV	3.8	4.2		3.8	4.2		V
Common Mode Rejection	V _{CM} = 2.3V to V _{REF}	70	90		70	90		dB
Supply Voltage Rejection	V _{IN} = 7V to 40V	76	100		76	100		dB
Gain-Bandwidth Product (Note 7)	T _J = 25°C	1	2		1	2		MHz
P.W.M. Comparator (Note 4)								
Minimum Duty Cycle	V _{COMP} = 0.5V			0			0	%
Maximum Duty Cycle	V _{COMP} = 3.9V	45	49		45	49		%
Current Limit Amplifier Section (Note 6)								
Sense Voltage		180	200	220	170	200	230	mV
Input Bias Current			-3	-10		-3	-10	μA
Shutdown Input Section								
HIGH Input Voltage		2.0			2.0			V
HIGH Input Current	V _{SHUTDOWN} = 5.0V		0.1	1		0.1	1	mA
LOW Input Voltage				0.6			0.6	V
Output Section (each transistor)								
Collector Leakage Current	V _{CE} = 60V			50			50	μA
Collector Saturation Voltage	I _C = 10mA		0.2	0.4		0.2	0.4	V
	I _C = 100mA		1.0	2.0		1.0	2.0	V
Emitter Output Voltage	I _E = 10mA	17.5	19		17.5	19		V
	I _E = 100mA	17	18		17	18		V
Emitter Voltage Rise Time (Note 7)	R _E = 2KΩ, T _A = 25°C		0.2	0.5		0.2	0.5	μs
Collector Voltage Fall Time	R _C = 2KΩ, T _A = 25°C		0.1	0.2		0.1	0.2	μs
Power Consumption								
Standby Current	V _{IN} = 40V, V _{SHUTDOWN} = 2.0V		5	12		5	12	mA

Note 4. $F_{OSC} = 45\text{KHz}$ ($R_T = 2700\Omega$, $C_T = .01\mu\text{F}$)Note 5. $V_{CM} = 2.3\text{V to } V_{REF}$ Note 6. $V_{CM} = 0\text{V to } 17.5\text{V}$

Note 7. These parameters, although guaranteed over the recommended operating conditions, are not tested in production.

TYPICAL CHARACTERISTIC CURVES

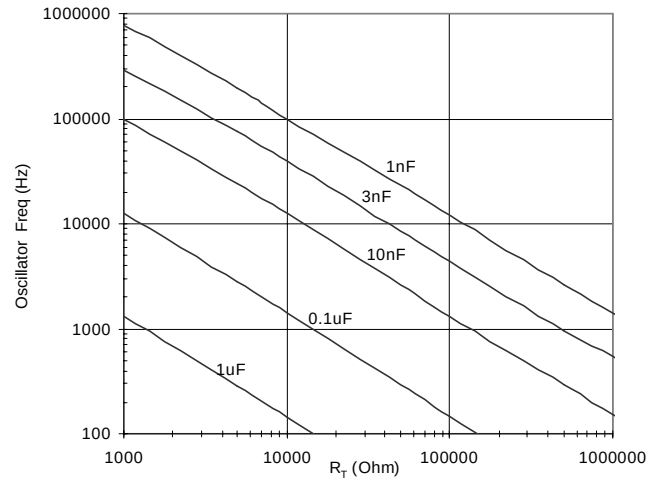


Figure 1
Oscillator Frequency vs. Timing Resistor and Capacitor
 $V_{IN}=20V$, $T_A=25^\circ C$

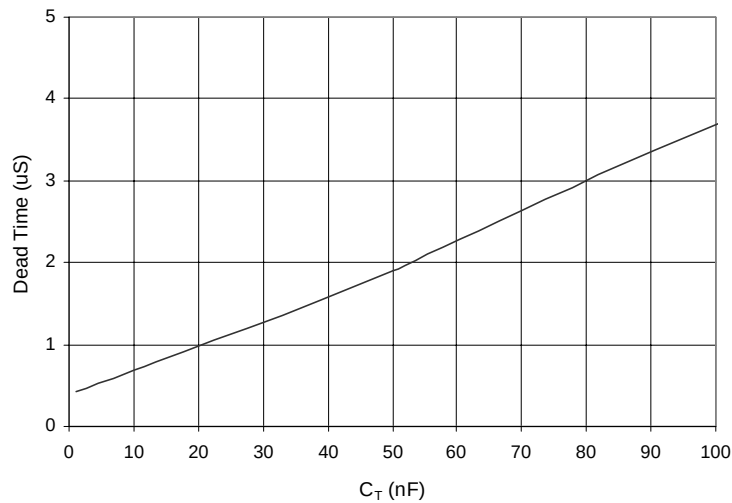


Figure 2
SG1524B Dead Time vs. Timing capacitance ($R_T=2.7k$)
 $V_{IN}=20V$, $T_A=25^\circ C$

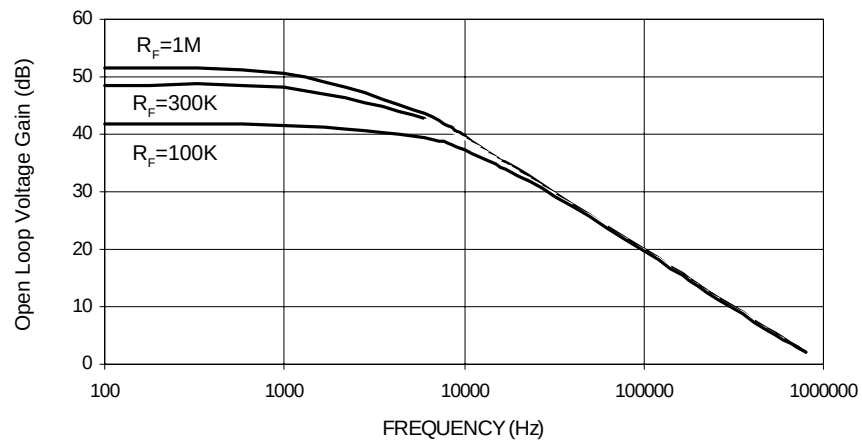


Figure 3
SG1524B Error Amp Voltage Gain vs. Freq over R_F
 $V_{IN}=20V$, $T_A=25^\circ C$

CONNECTION DIAGRAMS & ORDERING INFORMATION (See Notes Below)

Package	Part No.	Ambient Temperature Range	Connection Diagram
16-PIN CERAMIC DIP J - PACKAGE	SG1524BJ/883B SG1524BJ/DESC SG1524BJ SG2524BJ SG3524BJ	-55°C to 125°C -55°C to 125°C -55°C to 125°C -25°C to 85°C 0°C to 70°C	N Package: RoHS Compliant / Pb-free Transition DC: 0503 N Package: RoHS / Pb-free 100% Matte Tin Lead Finish
16-PIN PLASTIC DIP N - PACKAGE	SG2524BN SG3524BN	-25°C to 85°C 0°C to 70°C	
16-PIN WIDE BODY PLASTIC S.O.I.C. DW - PACKAGE	SG2524BDW SG3524BDW	-25°C to 85°C 0°C to 70°C	DW Package: RoHS Compliant / Pb-free Transition DC: 0516 DW Package: RoHS / Pb-free 100% Matte Tin Lead Finish
20-PIN CERAMIC LEADLESS CHIP CARRIER L - PACKAGE	SG1524BL/883B SG1524BL	-55°C to 125°C -55°C to 125°C	

Note 1. Contact factory for JAN and DESC product availability.
2. All packages are viewed from the top.