Elektronische Bauelemente

SCGS358J-C

Low Power Dual Operational Amplifiers

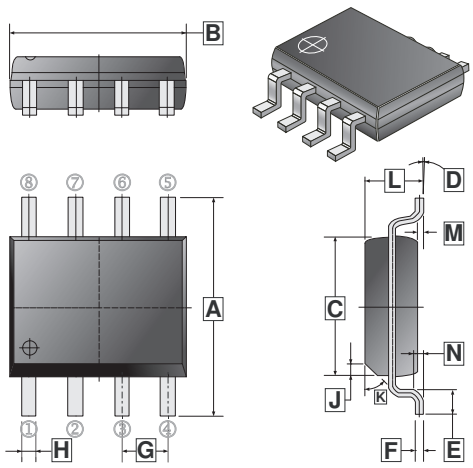
RoHS Compliant Product
A suffix of "-C" specifies halogen and lead-free

DESCRIPTION

The SCGS358J-C consists of two independent, high gain and internally frequency compensated operational amplifiers, it is specifically designed to operate from a single power supply.

Operation from split power supply is also possible and the low power supply current drain is independent of the magnitude of the power supply voltages.

SOP-8



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	5.79	6.20	H	0.33	0.51
B	4.70	5.11	J	0.375 REF.	
C	3.80	4.00	K	45° REF.	
D	0°	8°	L	1.30	1.752
E	0.40	1.27	M	0	0.30
F	0.10	0.25	N	0.25 REF.	
G	1.27 TYP.				

FEATURES

- Internally Frequency Compensated for Unity Gain
- Large Voltage Gain: 100dB (Typ.)
- Low Input Bias Current: 20nA (Typ.)
- Low Input Offset Voltage: 2mV (Typ.)
- Low Supply Current: 0.5mV (Typ.)
- Wide Power Supply Voltage Range
  - Single Supply: 3V to 32V
  - Dual Supplies: ±1.5V to ±16V
- Input Common Mode Voltage Range Includes Ground
- Large Output Voltage Swing: from 0V to Vcc-1.5V
- Power Drain Suitable for Battery Operation

MARKING

CJ358 161

PACKAGE INFORMATION

Package	MPQ	Leader Size
SOP-8	4K	13 inch

ORDER INFORMATION

Part Number	Type
SCGS358J-C	Lead (Pb)-free and Halogen-free

RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Min.	Max.	Unit
Supply Voltage	V_{CC}	3	30	V
Ambient Operating Temperature Range	T_A	-	70	°C

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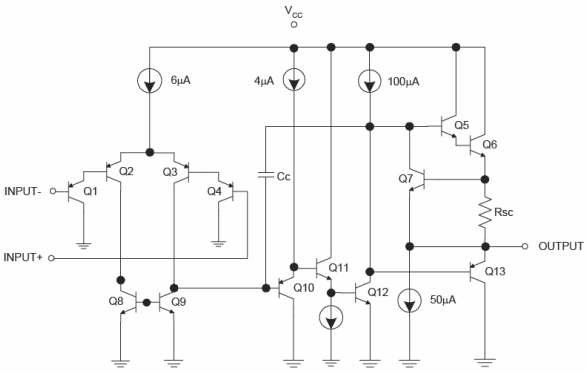
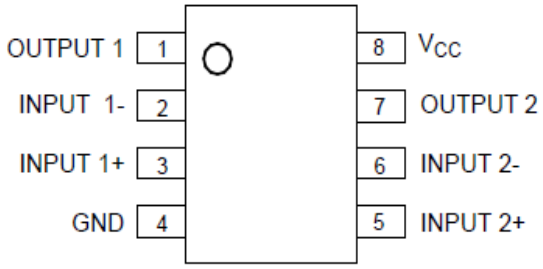
BLOCK DIAGRAM



PIN CONFIGURATIONS



ABSOLUTE MAXIMUM RATINGS

Parameter		Symbol	Rating	Unit
Power Supply Voltage		V_{CC}	32	V
Differential Input Voltage		V_{ID}	32	V
Input Voltage		V_{IC}	-0.3~32	V
Input Current [2] @V_{IN}< -0.3V		I_{IN}	50	mA
Output Short Circuit to Ground (One Amplifier) [3] @V_{CC}≤15V, T_A=25℃			Continuous	
Power Dissipation	T_A=25℃	P_D	550	mW
Operating Junction Temperature		T_J	0~70	℃
Storage Temperature Range		T_{STG}	-65~150	
Lead Temperature (Soldering, 10 Seconds)		T_{LEAD}	260	
Thermal Resistance from Junction-Case		$R_{\theta JC}$	98.84	℃/W

Notes:

1. Stresses greater than those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device under these conditions is not implied. Exposure to "Absolute Maximum Ratings" for extended periods may affect device reliability.
2. This input current will only exist when the voltage at any of the input leads is driven negative. It is due to the collector-base junction of the input PNP transistors becoming forward biased and thereby acting as input diode clamps. In addition to this diode action, there is also lateral NPN parasitic transistor action on the IC chip. This transistor action can cause the output voltages of the op amps to go to the VCC voltage level (or to ground for a large overdrive) for the time duration that an input is driven negative. This is not destructive and normal output states will re-establish when the input voltage, which was negative, again returns to a value greater than -0.3V (at 25℃)
3. Short circuits from the output to VCC can cause excessive heating and eventual destruction. When considering short circuits to ground, the maximum output current is approximately 40mA independent of the magnitude of VCC. At values of supply voltage in excess of +15V, continuous short circuits can exceed the power dissipation ratings and cause eventual destruction. Destructive dissipation can result from simultaneous shorts on all amplifiers.

ELECTRICAL CHARACTERISTICS (V_{CC}=5V, GND=0, T_A=25℃, unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Condition
Input Offset Voltage	V_{IO}	-	2	7	mV	V_{CC}=5V to 30V, V_O=1.4V, R_S=0Ω
Input Offset Current	I_{IO}	-	5	50	nA	$I_{IN}^{(+)}$-$I_{IN}^{(-)}$, V_{CM}=0V
Input Bias Current [1]	I_{BIAS}	-	20	250	nA	$I_{IN}^{(+)}$ or $I_{IN}^{(-)}$, V_{CM}=0V
Input Common Mode Voltage Range [2]	V_{IR}	0	-	V_{CC}-1.5	V	V_{CC}=30V
Supply Current	I_{CC}	-	1	2	mA	R_L=∞, V_{CC}=30V
		-	0.5	1.2		R_L=∞, V_{CC}=5V
Large Signal Voltage Gain	G_V	88	100	-	dB	V_{CC}=15V,R_L≧2kΩ V_O=1V to 11V
Output Voltage Swing	$V_{(OH)}$	26	-	-	V	V_{CC}=30V,R_L=2kΩ
		27	28	-		V_{CC}=30V,R_L=10kΩ
	$V_{(OL)}$	-	5	20	mV	V_{CC}=5V,R_L=10kΩ
Common Mode Rejection Ratio	CMRR	65	85	-	dB	V_{CM}=0V to (V_{CC}-1.5)V
Power Supply Rejection Ratio	PSRR	65	90	-	dB	V_{CC}=5V to 30V
Channel Separation [3]	CS	-	-120	-	dB	f=1kHz to 20kHz
Output Short Circuit to GND	I_{SC}	-	40	60	mA	V_{CC}=15V
Output Current	I_{SOURCE}	20	40	-	mA	$V_{IN}^{(+)}$=1V, $V_{IN}^{(-)}$=0V V_{CC}=15V, V_O=2V
	I_{SINK}	10	20	-	mA	$V_{IN}^{(+)}$=0V, $V_{IN}^{(-)}$=1V V_{CC}=15V,V_O=2V
		12	50	-	μA	$V_{IN}^{(+)}$=0V,$V_{IN}^{(-)}$=1V V_{CC}=15V,V_O=0.2V

Notes:

1. The direction of the input current is out of the IC due to the PNP input stage. This current is essentially constant, independent of the state of the output so no loading change exists on the input lines.
2. The input common-mode voltage of either input signal voltage should not be allowed to go negatively by more than 0.3V (at 25℃). The upper end of the common-mode voltage range is V_{CC}-1.5V (at 25℃), but either or both inputs can go t o +32V without damages, independent of the magnitude of the V_{CC}.
3. Due to proximity of external components, insure that coupling is not originating via stray capacitors between these external parts. This typically can be detected as this type of capacitance increases at higher frequencies.

TYPICAL CHARACTERISTIC CURVES SCGS358J-C

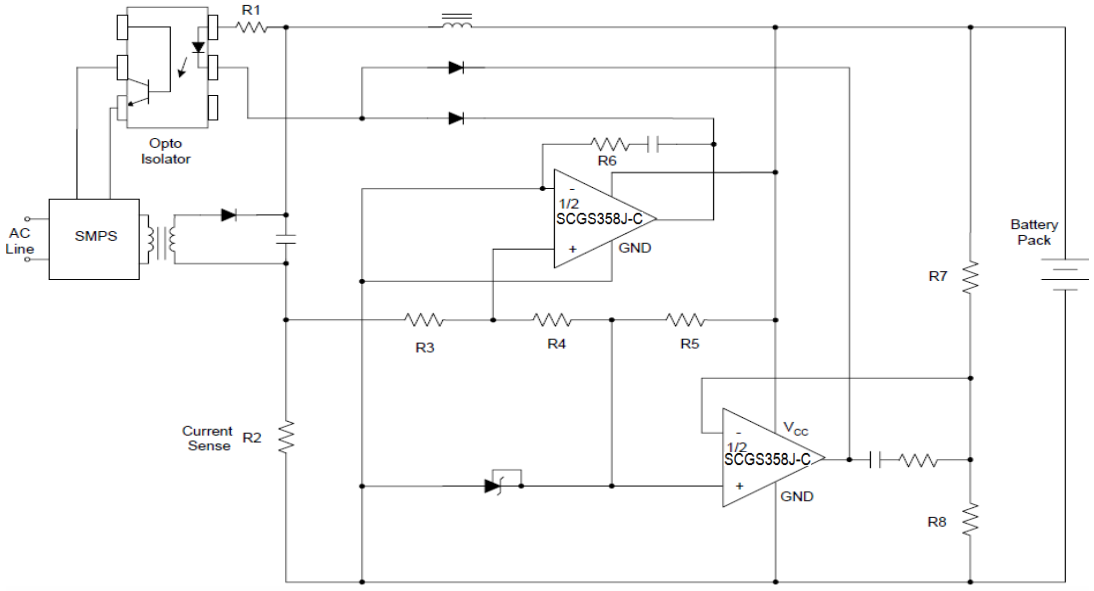


Figure 1. Battery Charger

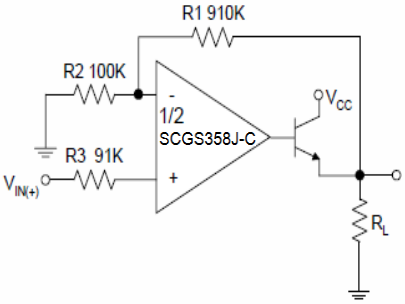


Figure 2. Power Amplifier

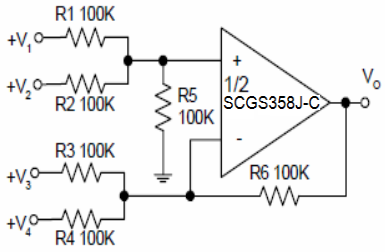


Figure 3. DC Summing Amplifier

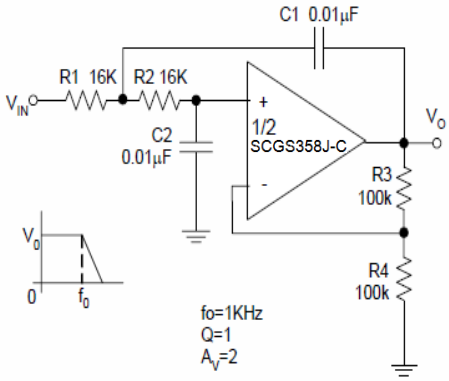


Figure 4. DC Coupled Low-Pass Active Filter

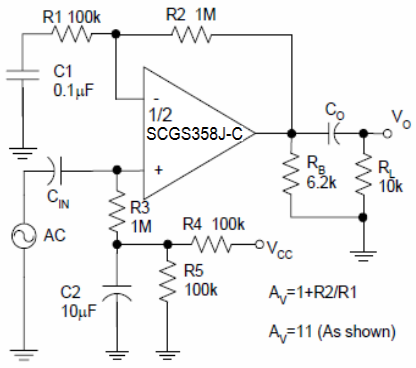


Figure 5. AC Coupled Non-Inverting Amplifier

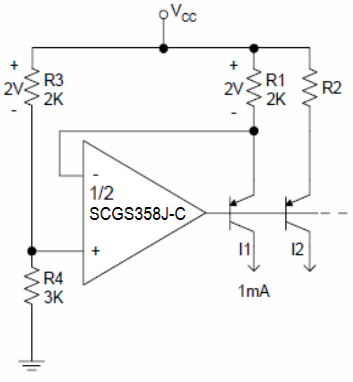


Figure 6. Fixed Current Sources

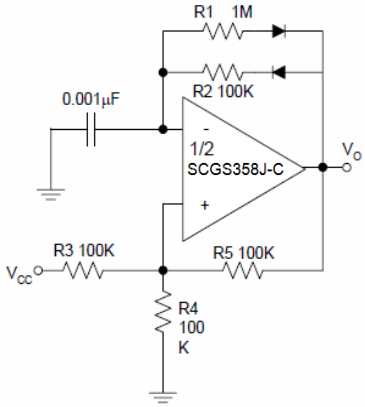


Figure 7. Pulse Generator