ACS715

Automotive Grade, Fully Integrated, Hall-Effect-Based Linear Current Sensor IC with 2.1 kVRMS Voltage Isolation and Low-Resistance Current Conductor

Not for New Design

The ACS715 is in production but has been determined to be NOT FOR NEW DESIGN. This classification indicates that sale of this device is currently restricted to existing customer applications. The device should not be purchased for new design applications because obsolescence in the near future is probable. Samples are no longer available.

Date of status change: March 14, 2025

Recommended Substitutions:

For existing customer transition, and for new customers or new applications, refer to ACS71240, ACS37010, or ACS724.

NOTE: For detailed information on purchasing options, contact your local Allegro field applications engineer or sales representative.

ACS715

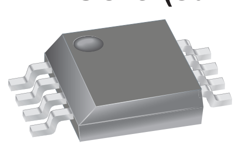
Automotive Grade, Fully Integrated, Hall-Effect-Based Linear Current Sensor IC with 2.1 kVRMS Voltage Isolation and Low-Resistance Current Conductor

FEATURES AND BENEFITS

- Low-noise analog signal path
- Device bandwidth is set via the FILTER pin
- 5 µs output rise time in response to step input current
- 80 kHz bandwidth
- Total output error 1.5% typical at T_A= 25°C
- Small footprint, low-profile SOIC8 package
- 1.2 mΩ internal conductor resistance
- 2.1 kVRMS minimum isolation voltage from pins 1-4 to pins 5-8
- 5.0 V, single supply operation
- 133 to 185 mV/A output sensitivity
- Output voltage proportional to DC currents
- Factory-trimmed for accuracy
- Extremely stable output offset voltage
- Nearly zero magnetic hysteresis
- Ratiometric output from supply voltage
- Operating temperature range, –40°C to 150°C

TÜV America
Certificate Number:
U8V 15 05 54214 038
CB 13 06 54214 026

PACKAGE: 8-Pin SOIC (suffix LC)



Not to scale

DESCRIPTION

The Allegro™ ACS715 provides economical and precise solutions for DC current sensing in automotive systems. The device package allows for easy implementation by the customer. Typical applications include motor control, load detection and management, switch-mode power supplies, and overcurrent fault protection.

The device consists of a precise, low-offset, linear Hall circuit with a copper conduction path located near the surface of the die. Applied current flowing through this copper conduction path generates a magnetic field which the Hall IC converts into a proportional voltage. Device accuracy is optimized through the close proximity of the magnetic signal to the Hall transducer. A precise, proportional voltage is provided by the low-offset, chopper-stabilized BiCMOS Hall IC, which is programmed for accuracy after packaging.

The output of the device has a positive slope (>$V_{IOUT(Q)}$) when an increasing current flows through the primary copper conduction path (from pins 1 and 2, to pins 3 and 4), which is the path used for current sampling. The internal resistance of this conductive path is 1.2 mΩ typical, providing low power loss. The thickness of the copper conductor allows survival of the device at up to 5× overcurrent conditions. The terminals of the conductive path are electrically isolated from the signal

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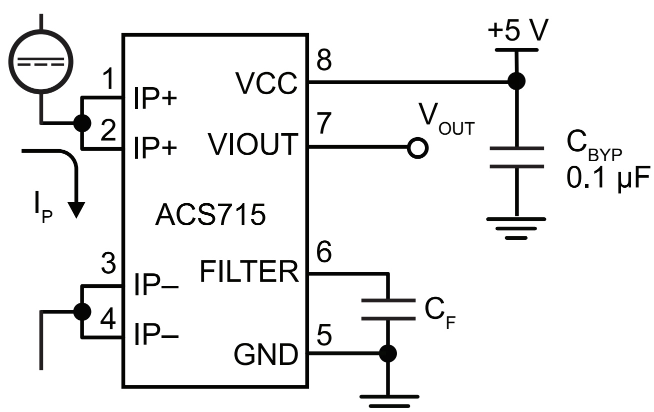

Typical Application 1.
The ACS715 outputs an analog signal, V_{OUT}. that varies linearly with the unidirectional DC primary sampled current, I_P, within the range specified. C_F is recommended for noise management, with values that depend on the application.

DESCRIPTION (continued)

leads (pins 5 through 8). This allows the ACS715 to be used in applications requiring electrical isolation without the use of opto-isolators or other costly isolation techniques.

The ACS715 is provided in a small, surface mount SOIC8 package.

The leadframe is plated with 100% matte tin, which is compatible with standard lead (Pb) free printed circuit board assembly processes. Internally, the device is Pb-free, except for flip-chip high-temperature Pb-based solder balls, currently exempt from RoHS. The device is fully calibrated prior to shipment from the factory.

SELECTION GUIDE

Part Number	Current Sensing Range, I_P (A)	Sensitivity, Sens (Typ) (mV/A)	T_A (°C)	Packing*
ACS715ELCTR-20A-T	0 to 20	185	–40 to 85	Tape and reel, 3000 pieces/reel
ACS715ELCTR-30A-T	0 to 30	133		
ACS715LLCTR-20A-T	0 to 20	185	–40 to 150	
ACS715LLCTR-30A-T	0 to 30	133		

*Contact Allegro for additional packing options.

ABSOLUTE MAXIMUM RATINGS

Characteristic	Symbol	Notes	Rating	Unit
Supply Voltage	V_{CC}		8	V
Reverse Supply Voltage	V_{RCC}		–0.1	V
Output Voltage	V_{IOUT}		8	V
Reverse Output Voltage	V_{RIOUT}		–0.1	V
Output Current Source	$I_{OUT(Source)}$		3	mA
Output Current Sink	$I_{OUT(Sink)}$		10	mA
Overcurrent Transient Tolerance	I_P	1 pulse, 100 ms	100	A
Nominal Operating Ambient Temperature	T_A	Range E	–40 to 85	°C
		Range L	–40 to 150	°C
Maximum Junction Temperature	T_J(max)		165	°C
Storage Temperature	T_{stg}		–65 to 170	°C

ISOLATION CHARACTERISTICS

Characteristic	Symbol	Notes	Rating	Unit
Dielectric Strength Test Voltage*	V_{ISO}	Agency type-tested for 60 seconds per UL standard 60950-1, 1st Edition	2100	VAC
Working Voltage for Basic Isolation	V_{WFSI}	For basic (single) isolation per UL standard 60950-1, 1st Edition	354	VDC or V_{pk}
Working Voltage for Reinforced Isolation	V_{WFRI}	For reinforced (double) isolation per UL standard 60950-1, 1st Edition	184	VDC or V_{pk}

* Allegro does not conduct 60-second testing. It is done only during the UL certification process.

Parameter	Specification
Fire and Electric Shock	CAN/CSA-C22.2 No. 60950-1-03 UL 60950-1:2003 EN 60950-1:2001

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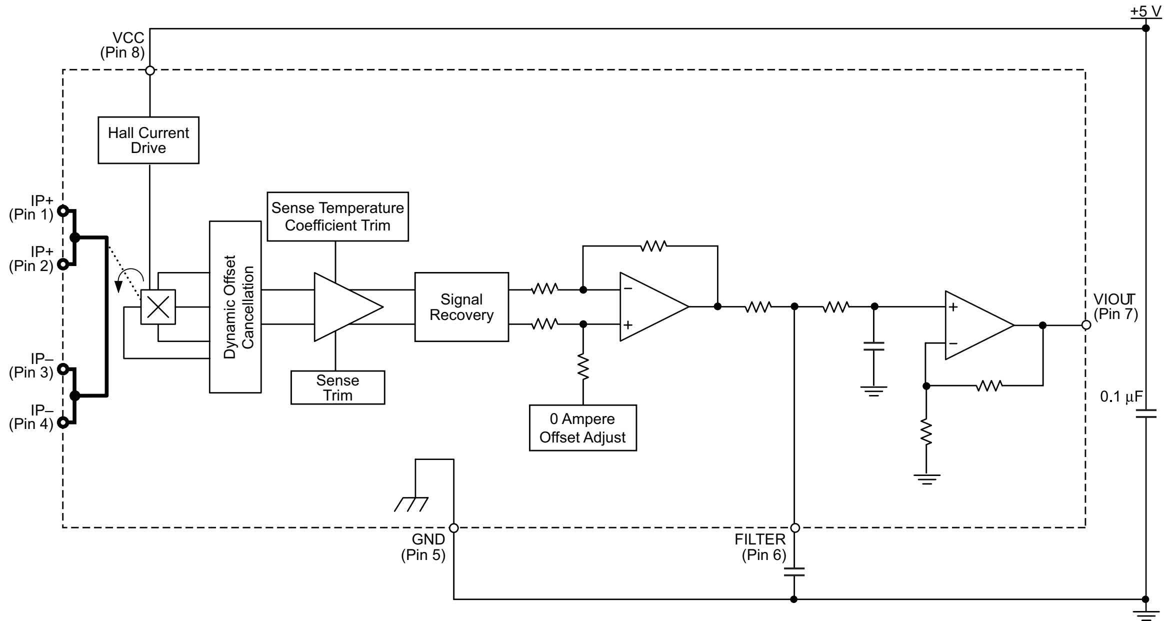
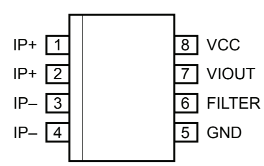


Functional Block Diagram



Package LC, 8-Pin SOIC Pinout Diagram

Terminal List

Number	Name	Description
1 and 2	IP+	Input terminals for current being sampled; fused internally
3 and 4	IP–	Output terminals for current being sampled; fused internally
5	GND	Signal ground terminal
6	FILTER	Terminal for external capacitor that sets bandwidth
7	VIOUT	Analog output signal
8	VCC	Device power supply terminal

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COMMON OPERATING CHARACTERISTICS [1] : Over full range of T_A, and V_{CC} = 5 V, unless otherwise specified

Characteristic	Symbol	Test Conditions	Min.	Typ.	Max.	Units
ELECTRICAL CHARACTERISTICS						
Supply Voltage	V_{CC}		4.5	5.0	5.5	V
Supply Current	I_{CC}	V_{CC} = 5.0 V, output open	–	10	13	mA
Output Capacitance Load	C_{LOAD}	VIOUT to GND	–	–	10	nF
Output Resistive Load	R_{LOAD}	VIOUT to GND	4.7	–	–	kΩ
Primary Conductor Resistance	$R_{PRIMARY}$	T_A = 25°C	–	1.2	–	mΩ
Rise Time	t_r	$I_P = I_P$(max), T_A = 25°C, C_{OUT} = 10 nF	–	3.5	–	μs
Frequency Bandwidth	f	–3 dB, T_A = 25°C; I_P is 10 A peak-to-peak	–	80	–	kHz
Nonlinearity	E_{LIN}	Over full range of I_P, I_P applied for 5 ms	–	±1.5	–	%
Zero Current Output Voltage	$V_{IOUT(Q)}$	Unidirectional; I_P = 0 A, T_A = 25°C	–	V_{CC} × 0.1	–	V
Power-On Time	t_{PO}	Output reaches 90% of steady-state level, no capacitor on FILTER pin; T_J = 25; 20 A present on leadframe	–	35	–	μs
Magnetic Coupling [2]			–	12	–	G/A
Internal Filter Resistance [3]	$R_{F(INT)}$			1.7		kΩ

[1] Device may be operated at higher primary current levels, I_P, and ambient, T_A, and internal leadframe temperatures, T_A, provided that the Maximum Junction Temperature, T_J(max), is not exceeded.
[2] 1 G = 0.1 mT.
[3] $R_{F(INT)}$ forms an RC circuit via the FILTER pin.

COMMON THERMAL CHARACTERISTICS [1]

Characteristic	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Operating Internal Leadframe Temperature	T_A	E range	–40	–	85	°C
		L range	–40	–	150	°C

[1] Additional thermal information is available on the Allegro website.

x20A PERFORMANCE CHARACTERISTICS [1]: T_A = –40°C to 85°C (range E), C_F = 1 nF, and V_{CC} = 5 V, unless otherwise specified

Characteristic	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Optimized Accuracy Range	I_P		0	–	20	A
Sensitivity	Sens	Over full range of I_P, I_P applied for 5 ms; T_A = 25°C	178	185	190	mV/A
Noise	$V_{NOISE(PP)}$	Peak-to-peak, T_A = 25°C, 2 kHz external filter, 185 mV/A programmed Sensitivity, C_F = 47 nF, C_{OUT} = 10 nF, 2 kHz bandwidth	–	21	–	mV
Zero Current Output Slope	$\Delta V_{OUT(Q)}$	T_A = –40°C to 25°C	–	0.08	–	mV/°C
		T_A = 25°C to 150°C	–	0.16	–	mV/°C
Sensitivity Slope	ΔSens	T_A = –40°C to 25°C	–	0.035	–	mV/A/°C
		T_A = 25°C to 150°C	–	0.019	–	mV/A/°C
Electrical Output Voltage	V_{OE}	I_P = 0 A	–40	–	40	mV
Total Output Error [2]	E_{TOT}	I_P = 20 A, I_P applied for 5 ms; T_A = 25°C	–	±1.5	–	%

[1] Device may be operated at higher primary current levels, I_P, and ambient temperatures, T_A, provided that the Maximum Junction Temperature, T_J(max), is not exceeded.
[2] Percentage of I_P, with I_P = 20 A. Output filtered.

x20A PERFORMANCE CHARACTERISTICS [1]: T_A = –40°C to 150°C (range L), C_F = 1 nF, and V_{CC} = 5 V, unless otherwise specified

Characteristic	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Optimized Accuracy Range	I_P		0	–	20	A
Sensitivity	Sens	Over full range of I_P, I_P applied for 5 ms; T_A = 25°C	–	185	–	mV/A
		Over full range of I_P, T_A = –40°C to 150°C	161	–	194	mV/A
Noise	$V_{NOISE(PP)}$	Peak-to-peak, T_A = 25°C, 2 kHz external filter, 185 mV/A programmed Sensitivity, C_F = 47 nF, C_{OUT} = 10 nF, 2 kHz bandwidth	–	21	–	mV
Zero Current Output Slope	$\Delta V_{OUT(Q)}$	T_A = –40°C to 25°C	–	0.08	–	mV/°C
		T_A = 25°C to 150°C	–	0.16	–	mV/°C
Sensitivity Slope	ΔSens	T_A = –40°C to 25°C	–	0.035	–	mV/A/°C
		T_A = 25°C to 150°C	–	0.019	–	mV/A/°C
Electrical Output Voltage	V_{OE}	I_P = 0 A	–60	–	60	mV
Total Output Error [2]	E_{TOT}	I_P = 20 A, I_P applied for 5 ms; T_A = 25°C	–	±1.5	–	%
		I_P = 20 A, I_P applied for 5 ms; T_A = –40°C to 150°C	–6	–	6	%

[1] Device may be operated at higher primary current levels, I_P, and ambient temperatures, T_A, provided that the Maximum Junction Temperature, T_J(max), is not exceeded.
[2] Percentage of I_P, with I_P = 20 A. Output filtered.

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x30A PERFORMANCE CHARACTERISTICS [1]: T_A = –40°C to 85°C (range E), C_F = 1 nF, and V_{CC} = 5 V, unless otherwise specified

Characteristic	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Optimized Accuracy Range	I_P		0	–	30	A
Sensitivity	Sens	Over full range of I_P, I_P applied for 5 ms; T_A = 25°C	129	133	137	mV/A
Noise	$V_{NOISE(PP)}$	Peak-to-peak, T_A = 25°C, 2 kHz external filter, 133 mV/A programmed Sensitivity, C_F = 47 nF, C_{OUT} = 10 nF, 2 kHz bandwidth	–	15	–	mV
Zero Current Output Slope	$\Delta V_{OUT(Q)}$	T_A = –40°C to 25°C	–	0.06	–	mV/°C
		T_A = 25°C to 150°C	–	0.1	–	mV/°C
Sensitivity Slope	ΔSens	T_A = –40°C to 25°C	–	0.007	–	mV/A/°C
		T_A = 25°C to 150°C	–	–0.025	–	mV/A/°C
Electrical Output Voltage	V_{OE}	I_P = 0 A	–30	–	30	mV
Total Output Error [2]	E_{TOT}	I_P = 30 A, I_P applied for 5 ms; T_A = 25°C	–	±1.5	–	%

[1] Device may be operated at higher primary current levels, I_P, and ambient temperatures, T_A, provided that the Maximum Junction Temperature, T_J(max), is not exceeded.
[2] Percentage of I_P, with I_P = 30 A. Output filtered.

x30A PERFORMANCE CHARACTERISTICS [1]: T_A = –40°C to 150°C (range L), C_F = 1 nF, and V_{CC} = 5 V, unless otherwise specified

Characteristic	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Optimized Accuracy Range	I_P		0	–	30	A
Sensitivity	Sens	Over full range of I_P, I_P applied for 5 ms; T_A = 25°C	–	133	–	mV/A
		Over full range of I_P, T_A = –40°C to 150°C	125	–	137	mV/A
Noise	$V_{NOISE(PP)}$	Peak-to-peak, T_A = 25°C, 2 kHz external filter, 133 mV/A programmed Sensitivity, C_F = 47 nF, C_{OUT} = 10 nF, 2 kHz bandwidth	–	15	–	mV
Zero Current Output Slope	$\Delta V_{OUT(Q)}$	T_A = –40°C to 25°C	–	0.06	–	mV/°C
		T_A = 25°C to 150°C	–	0.1	–	mV/°C
Sensitivity Slope	ΔSens	T_A = –40°C to 25°C	–	0.007	–	mV/A/°C
		T_A = 25°C to 150°C	–	–0.025	–	mV/A/°C
Electrical Output Voltage	V_{OE}	I_P = 0 A, T_A = 25°C	–40	–	40	mV
		I_P = 0 A, T_A = –40°C to 150°C	–60	–	60	mV
Total Output Error [2]	E_{TOT}	I_P = 30 A, I_P applied for 5 ms; T_A = 25°C	–	±1.5	–	%
		I_P = 30 A, I_P applied for 5 ms; T_A = –40°C to 150°C	–5	–	5	%

[1] Device may be operated at higher primary current levels, I_P, and ambient temperatures, T_A, provided that the Maximum Junction Temperature, T_J(max), is not exceeded.
[2] Percentage of I_P, with I_P = 30 A. Output filtered.

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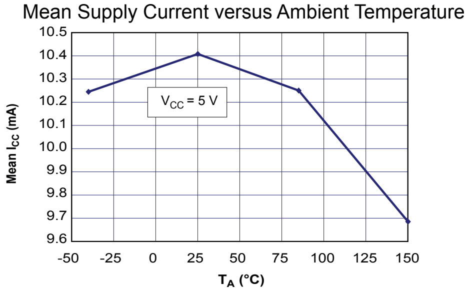
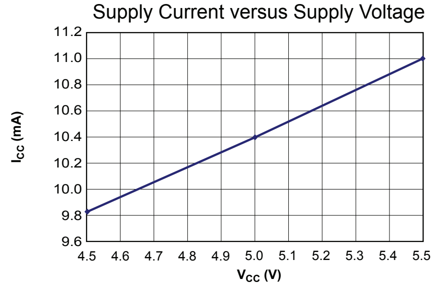
CHARACTERISTIC PERFORMANCE

I_P = 20 A, unless otherwise specified

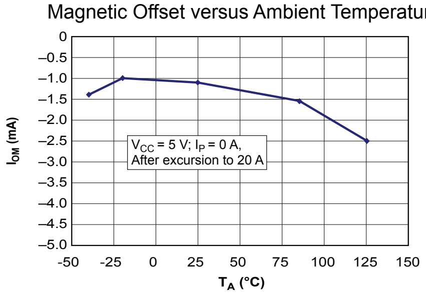
Mean Supply Current versus Ambient Temperature



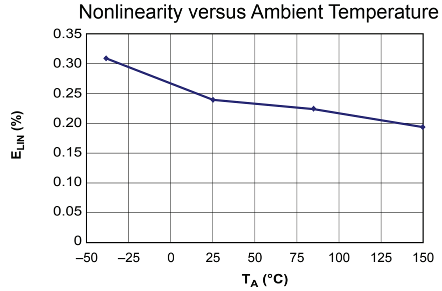
Supply Current versus Supply Voltage



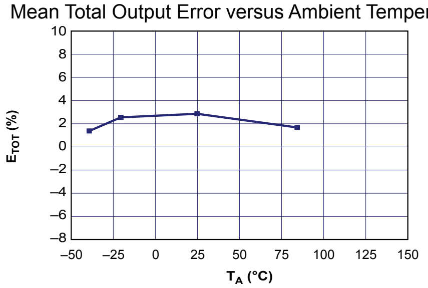
Magnetic Offset versus Ambient Temperature



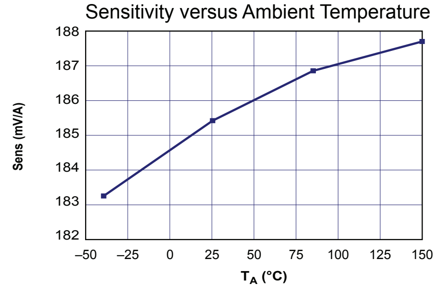
Nonlinearity versus Ambient Temperature



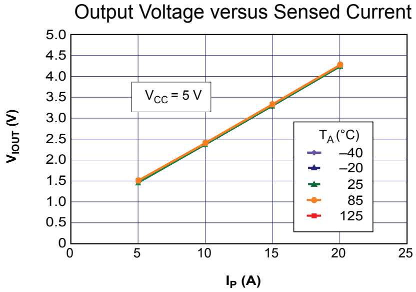
Mean Total Output Error versus Ambient Temperature



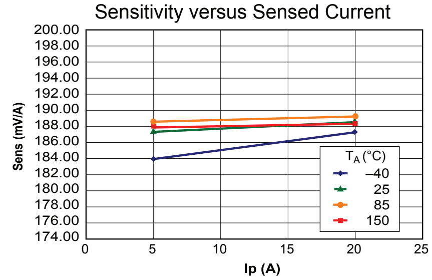
Sensitivity versus Ambient Temperature



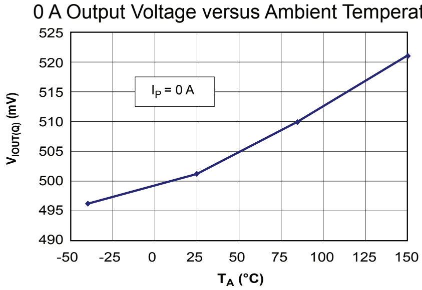
Output Voltage versus Sensed Current



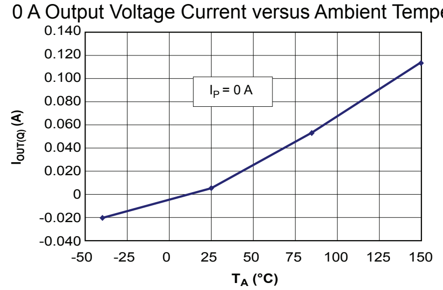
Sensitivity versus Sensed Current



0 A Output Voltage versus Ambient Temperature



0 A Output Voltage Current versus Ambient Temperature



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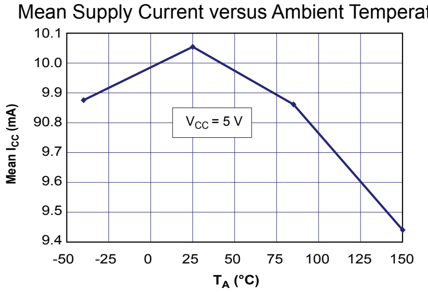
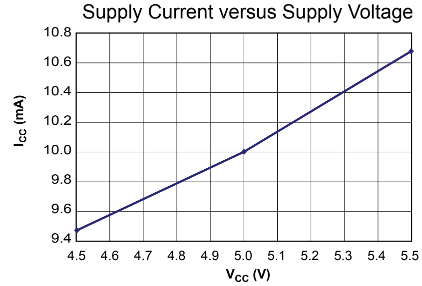
CHARACTERISTIC PERFORMANCE

I_P = 30 A, unless otherwise specified

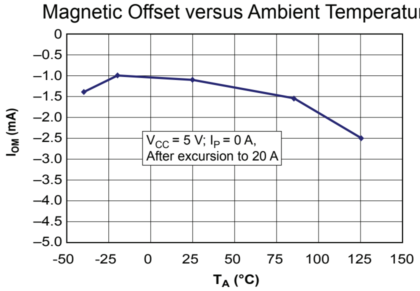
Mean Supply Current versus Ambient Temperature



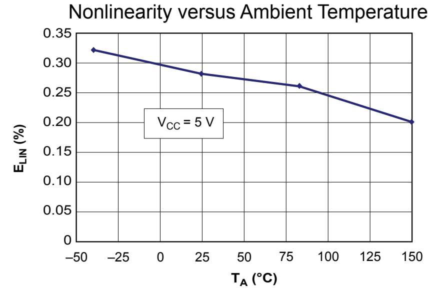
Supply Current versus Supply Voltage



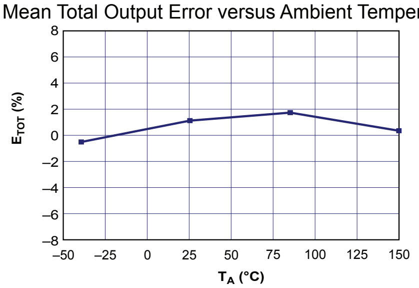
Magnetic Offset versus Ambient Temperature



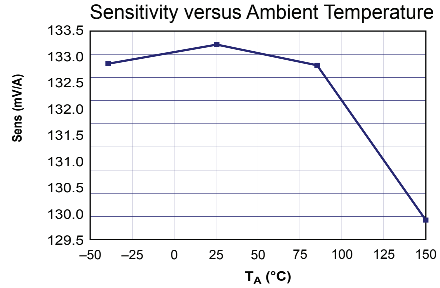
Nonlinearity versus Ambient Temperature



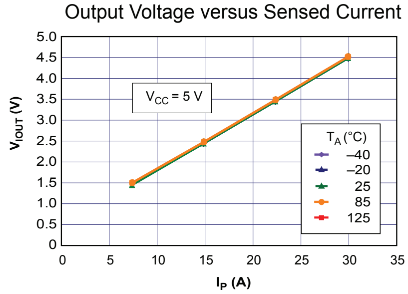
Mean Total Output Error versus Ambient Temperature



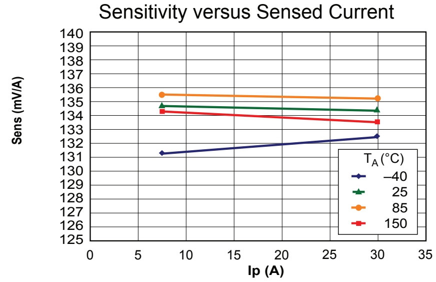
Sensitivity versus Ambient Temperature



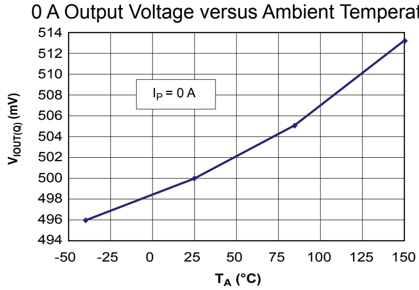
Output Voltage versus Sensed Current



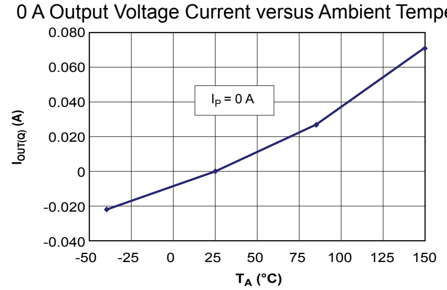
Sensitivity versus Sensed Current



0 A Output Voltage versus Ambient Temperature



0 A Output Voltage Current versus Ambient Temperature



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DEFINITIONS OF ACCURACY CHARACTERISTICS

Sensitivity (Sens). The change in device output in response to a 1 A change through the primary conductor. The sensitivity is the product of the magnetic circuit sensitivity (G/A) and the linear IC amplifier gain (mV/G). The linear IC amplifier gain is programmed at the factory to optimize the sensitivity (mV/A) for the full-scale current of the device.

Noise (V_{NOISE}). The product of the linear IC amplifier gain (mV/G) and the noise floor for the Allegro Hall effect linear IC (≈1 G). The noise floor is derived from the thermal and shot noise observed in Hall elements. Dividing the noise (mV) by the sensitivity (mV/A) provides the smallest current that the device is able to resolve.

Linearity (E_{LIN}). The degree to which the voltage output from the IC varies in direct proportion to the primary current through its full-scale amplitude. Nonlinearity in the output can be attributed to the saturation of the flux concentrator approaching the full-scale current. The following equation is used to derive the linearity:

$$100\left\{1-\left[\frac{(V_{IOUT\_full\text{-}scale\ amperes}-V_{IOUT(Q)})}{2\,(V_{IOUT\_half\text{-}scale\ amperes}-V_{IOUT(Q)})}\right]\right\}$$

where $V_{IOUT\_full\text{-}scale\ amperes}$ = the output voltage (V) when the sampled current approximates full-scale $\pm I_P$.

Quiescent output voltage ($V_{IOUT(Q)}$). The output of the device when the primary current is zero. For a unipolar supply voltage, it nominally remains at $V_{CC} \times 0.1$. Thus, V_{CC} = 5 V translates into $V_{IOUT(Q)}$ = 0.5 V. Variation in $V_{IOUT(Q)}$ can be attributed to the resolution of the Allegro linear IC quiescent voltage trim and thermal drift.

Electrical offset voltage (V_{OE}). The deviation of the device output from its ideal quiescent value of $V_{CC} \times 0.1$ due to nonmagnetic causes. To convert this voltage to amperes, divide by the device sensitivity, Sens.

Accuracy (E_{TOT}). The accuracy represents the maximum deviation of the actual output from its ideal value. This is also known as the total output error. The accuracy is illustrated graphically in the output voltage versus current chart at right.

Accuracy is divided into four areas:

- **0 A at 25°C.** Accuracy at the zero current flow at 25°C, without the effects of temperature.
- **0 A over Δ temperature.** Accuracy at the zero current flow including temperature effects.
- **Full-scale current at 25°C.** Accuracy at the the full-scale current at 25°C, without the effects of temperature.
- **Full-scale current over Δ temperature.** Accuracy at the full-scale current flow including temperature effects.

Ratiometry. The ratiometric feature means that its 0 A output, $V_{IOUT(Q)}$, (nominally equal to $V_{CC} \times 0.1$) and sensitivity, Sens, are proportional to its supply voltage, V_{CC}. The following formula is used to derive the ratiometric change in 0 A output voltage, $\Delta V_{IOUT(Q)RAT}$ (%).

$$100\left(\frac{V_{IOUT(Q)VCC}\ /\ V_{IOUT(Q)5V}}{V_{CC}\ /\ 5\ \mathrm{V}}\right)$$

The ratiometric change in sensitivity, $\Delta Sens_{RAT}$ (%), is defined as:

$$100\left(\frac{Sens_{VCC}\ /\ Sens_{5V}}{V_{CC}\ /\ 5\ \mathrm{V}}\right)$$

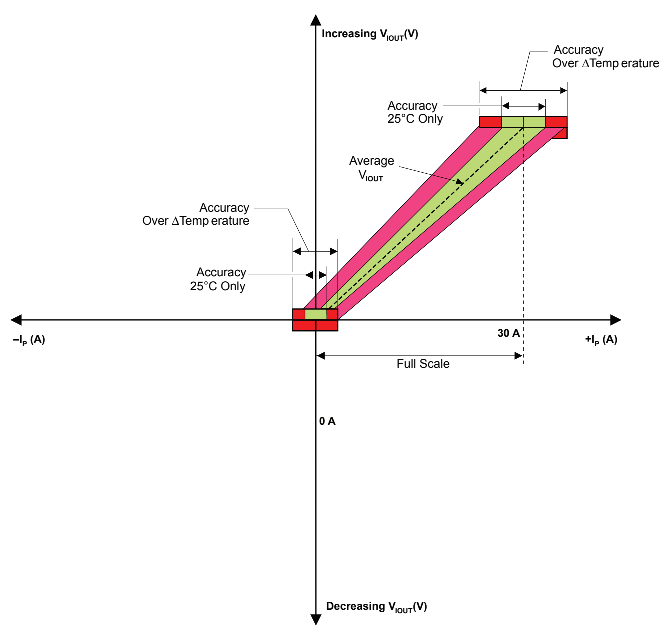

Figure 1: Output Voltage versus Sampled Current
Accuracy at 0 A and at Full-Scale Current

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DEFINITIONS OF DYNAMIC RESPONSE CHARACTERISITCS

Power-On Time (t_{PO}). When the supply is ramped to its operating voltage, the device requires a finite time to power its internal components before responding to an input magnetic field.

Power-On Time, t_{PO} , is defined as the time it takes for the output voltage to settle within ±10% of its steady state value under an applied magnetic field, after the power supply has reached its minimum specified operating voltage, V_{CC}(min), as shown in the chart at right.

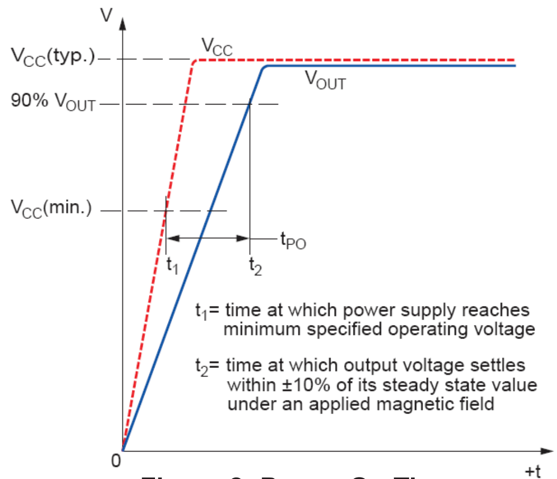


Figure 2: Power-On Time

Rise time (t_r). The time interval between a) when the device reaches 10% of its full scale value, and b) when it reaches 90% of its full scale value. The rise time to a step response is used to derive the bandwidth of the device, in which $f(–3\ dB) = 0.35 / t_r$. Both t_r and $t_{RESPONSE}$ are detrimentally affected by eddy current losses observed in the conductive IC ground plane.

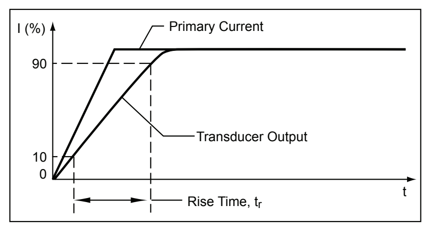
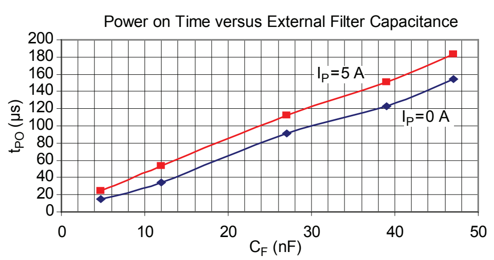
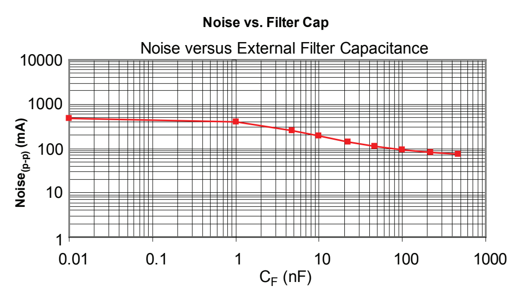
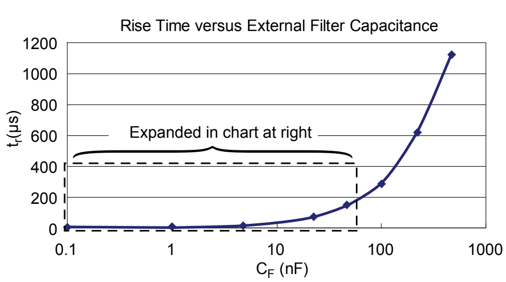


Figure 3: Rise Time







C_F (nF)	t_r (µs)
Open	3.5
1	5.8
4.7	17.5
22	73.5
47	88.2
100	291.3
220	623
470	1120

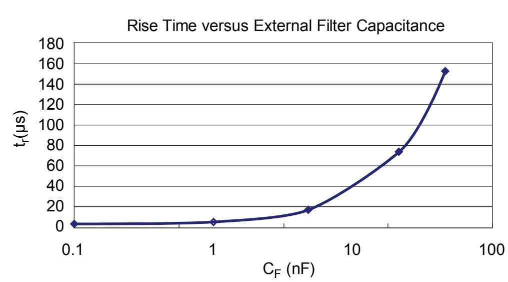


Figure 4: Power-On and Rise Time Characteristics

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CHOPPER STABILIZATION TECHNIQUE

Chopper Stabilization is an innovative circuit technique that is used to minimize the offset voltage of a Hall element and an associated on-chip amplifier. Allegro has a Chopper Stabilization technique that nearly eliminates Hall IC output drift induced by temperature or package stress effects. This offset reduction technique is based on a signal modulation-demodulation process. Modulation is used to separate the undesired DC offset signal from the magnetically induced signal in the frequency domain. Then, using a low-pass filter, the modulated DC offset is suppressed while the magnetically induced signal passes through the filter. As a result of this chopper stabilization approach, the output voltage from the Hall IC is desensitized to the effects of temperature and mechanical stress. This technique produces devices that have an extremely stable Electrical Offset Voltage, are immune to thermal stress, and have precise recoverability after temperature cycling.

This technique is made possible through the use of a BiCMOS process that allows the use of low-offset and low-noise amplifiers in combination with high-density logic integration and sample and hold circuits.

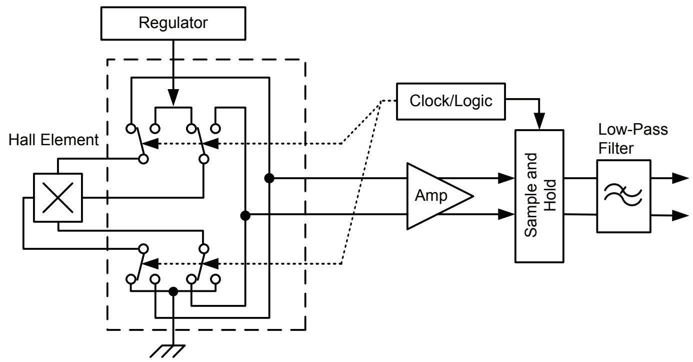
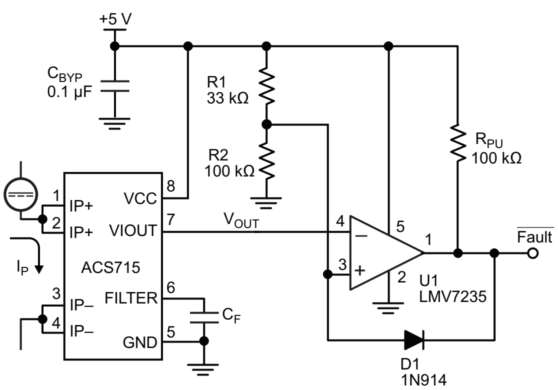
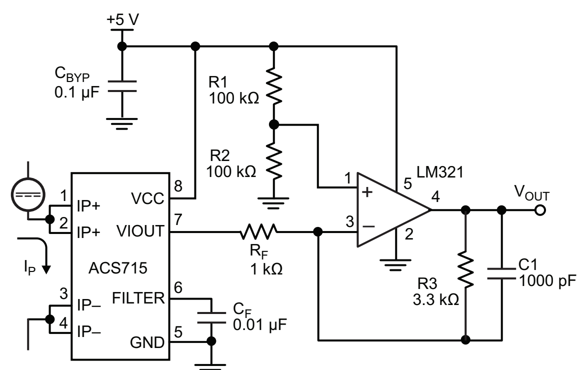


Figure 5: Concept of Chopper Stabilization Technique



Application 2. 10 A Overcurrent Fault Latch. Fault threshold set by R1 and R2. This circuit latches an overcurrent fault and holds it until the 5 V rail is powered down.



Application 3. This configuration increases gain to 610 mV/A (tested using the ACS712ELC-05A).

Application 4. Control circuit for MOSFET ORing.

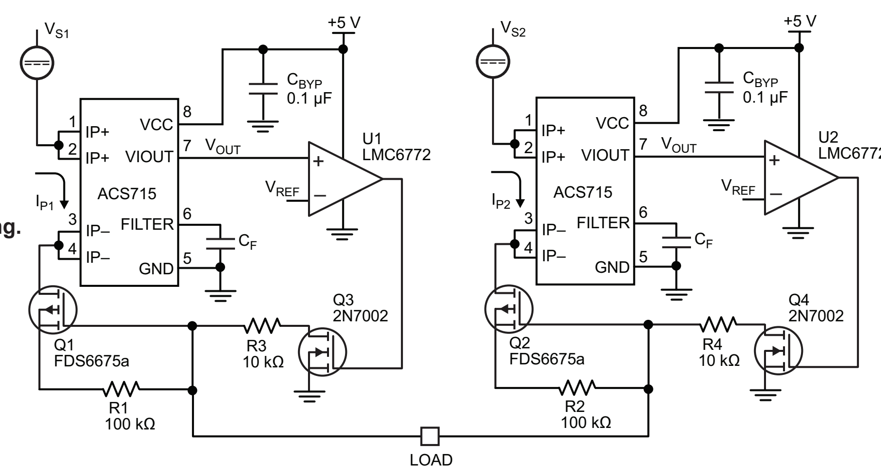


Figure 6: Typical Applications

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IMPROVING SENSING SYSTEM ACCURACY USING THE FILTER PIN

In low-frequency sensing applications, it is often advantageous to add a simple RC filter to the output of the device. Such a low-pass filter improves the signal-to-noise ratio, and therefore the resolution, of the device output signal. However, the addition of an RC filter to the output of a sensor IC can result in undesirable device output attenuation — even for DC signals.

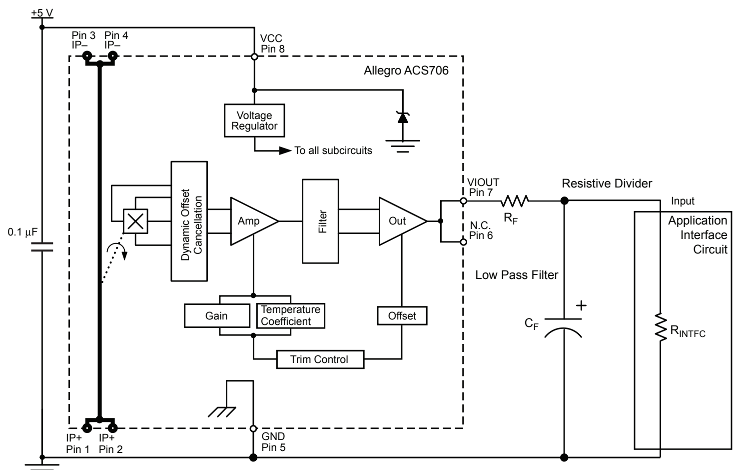
Signal attenuation, ΔV_{ATT}, is a result of the resistive divider effect between the resistance of the external filter, R_F (see Application 5), and the input impedance and resistance of the customer interface circuit, R_{INTFC}. The transfer function of this resistive divider is given by:

$$\Delta V_{ATT} = V_{IOUT}\left(\frac{R_{INTFC}}{R_F + R_{INTFC}}\right) .$$

Even if R_F and R_{INTFC} are designed to match, the two individual resistance values will most likely drift by different amounts over temperature. Therefore, signal attenuation will vary as a function of temperature. Note that, in many cases, the input impedance, R_{INTFC}, of a typical analog-to-digital converter (ADC) can be as low as 10 kΩ.

The ACS715 contains an internal resistor, a FILTER pin connection to the printed circuit board, and an internal buffer amplifier. With this circuit architecture, users can implement a simple RC filter via the addition of a capacitor, C_F (see Application 6) from the FILTER pin to ground. The buffer amplifier inside of the ACS715 (located after the internal resistor and FILTER pin connection) eliminates the attenuation caused by the resistive divider effect described in the equation for ΔV_{ATT}. Therefore, the ACS715 device is ideal for use in high-accuracy applications that cannot afford the signal attenuation associated with the use of an external RC low-pass filter.

Application 5. When a low pass filter is constructed externally to a standard Hall effect device, a resistive divider may exist between the filter resistor, R_F, and the resistance of the customer interface circuit, R_{INTFC}. This resistive divider will cause excessive attenuation, as given by the transfer function for ΔV_{ATT}.



Application 6. Using the FILTER pin provided on the ACS715 eliminates the attenuation effects of the resistor divider between R_F and R_{INTFC}, shown in Application 5.

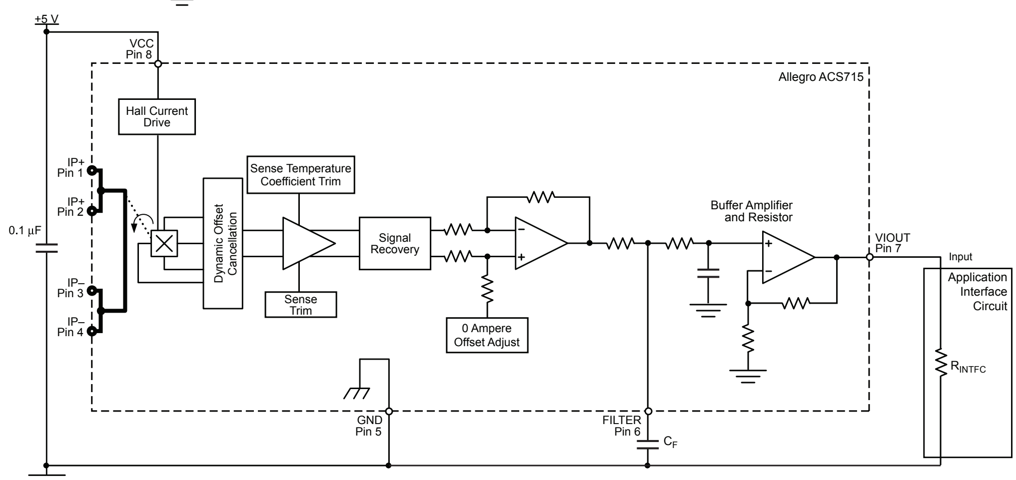


Figure 7: Typical Applications

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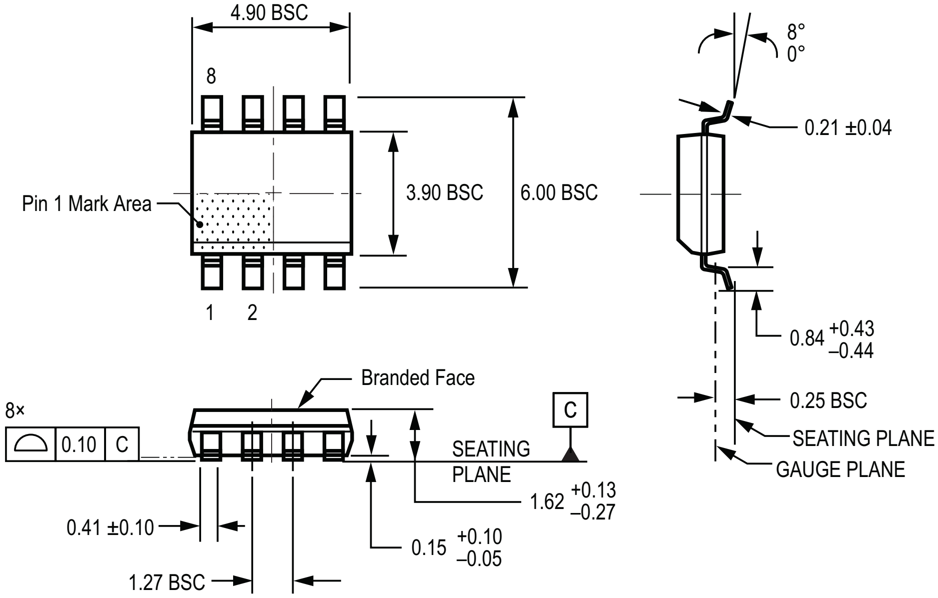
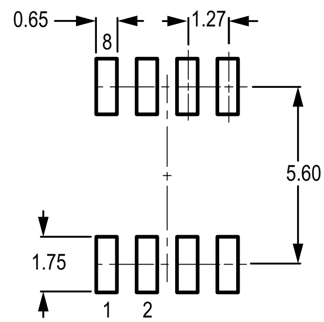
PACKAGE OUTLINE DRAWING

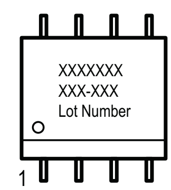
For Reference Only; not for tooling use

(reference Allegro DWG-0000385, Rev. 2 or JEDEC MS-012AA)
Dimensions in millimeters – Not to scale
Dimensions exclusive of mold flash, gate burrs, and dambar protrusions
Exact case and lead configuration at supplier discretion within limits shown





PCB Layout Reference View
Reference land pattern layout
(reference IPC7351 SOIC127P600X175-8M);
all pads a minimum of 0.20 mm from all adjacent pads;
adjust as necessary to meet application process
requirements and PCB layout tolerances.



Standard Branding Reference View

Lines 1, 2 = 8 characters
Line 3 = 5 characters

Line 1: Part Number
Line 2: Temp, Pkg - Amps
Line 3: First 5 Characters of Assembly Lot Number

Belly Brand: Country of Origin, Lot Number

Branding scale and appearance at supplier discretion

Figure 8: Package LC, 8-pin SOIC

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REVISION HISTORY

Number	Date	Description
9	November 16, 2014	Update rise time and isolation, I_{OUT} reference data, patents
10	June 24, 2015	Revised performance characteristics
11	June 5, 2017	Updated product status
12	December 10, 2018	Updated certificate numbers
13	May 20, 2019	Updated TUV certificate mark
14	February 3, 2020	Updated product status
15	February 3, 2022	Updated package drawing (page 13)
16	February 9, 2023	Updated selection guide heading (page 2)
17	March 12, 2025	Changed product status to not for new design (cover sheet), modified common thermal characteristics table, and removed patent numbers (page 14)

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