

## 36V,11MHz, 23V/μs Opamps

### Features

- Supply Voltage: 3.3V to 36V
- Offset Voltage:  $\pm 100\mu\text{V}$  Maximum
- Differential Input Voltage Range to Supply Rail, can Work as Comparator
- Input Rail to -VS , Rail to Rail Output
- Bandwidth: 11MHz
- Slew Rate: 23V/μs
- Excellent EMI Suppress Performance: 45dB at 1GHz
- Quiescent Current: 2.7mA per Amplifier (Typ)
- -40°C to 125°C Operation Temperature Range
- Small Package:

LM6142 Available in SOP-8 and MSOP-8 Packages

LM6144 Available in SOP-14 and TSSOP-14 Packages



### Ordering Information

DEVICE	Package Type	MARKING	Packing	Packing Qty
LM6142M/TR	SOP-8	LM6142	REEL	2500pcs/reel
LM6142MM/TR	MSOP-8	LM6142	REEL	3000pcs/reel
LM6144M/TR	SOP-14	LM6144	REEL	2500pcs/reel
LM6144MT/TR	TSSOP-14	LM6144	REEL	2500pcs/reel

## General Description

The LM614X series amplifiers are newest high supply voltage amplifiers with low offset, low power and stable high frequency response. Good AC performance with 11MHz bandwidth, 23V/ $\mu$ s slew rate and low distortion while drawing only 2.7mA of quiescent current per amplifier. The input common-mode voltage range extends to  $-V_S$ , and the outputs swing rail-to-rail. The LM614X family can be used as plug-in replacements for many commercially available Op-Amps to reduce power and improve input/output range and performance. The LM6142 Dual is available in Green SOP-8 and MSOP-8 packages. The LM6144 Quad is available in Green SOP-14 and TSSOP-14 packages.

## Applications

- Instrumentation
- Active Filters, ASIC Input or Output Amplifier
- Sensor Interface
- Motor Control
- Industrial Control

## Pin Configuration

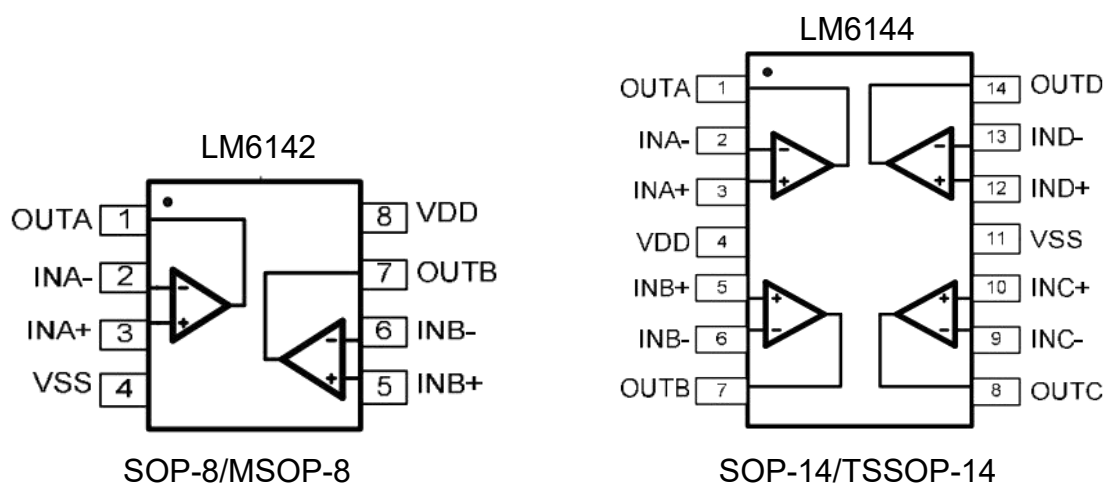


Figure 1. Pin Assignment Diagram

## Absolute Maximum Ratings

Condition	Min	Max
Power Supply Voltage (V <sub>DD</sub> to V <sub>ss</sub> )	-0.5V	+40V
Analog Input Voltage (IN+ or IN-)	V <sub>ss</sub> -0.5V	V <sub>DD</sub> +0.5V
PDB Input Voltage	V <sub>ss</sub> -0.5V	+40V
Operating Temperature Range	-40°C	+125°C
Junction Temperature	+160°C	
Storage Temperature Range	-55°C	+150°C
Lead Temperature (soldering, 10sec)	+260°C	
Package Thermal Resistance (TA=+25°C)		
SOP-8, θJA	125°C/W	
MSOP-8, θJA	216°C/W	
SOP-14, θJA	120°C/W	
TSSOP-14, θJA	180°C/W	
ESD Susceptibility		
HBM	2KV	
MM	300V	

**Note:** Stress greater than those listed under Absolute Maximum Ratings may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions outside those indicated in the operational sections of this specification are not implied. Exposure to absolute maximum rating conditions for extended periods may affect reliability.

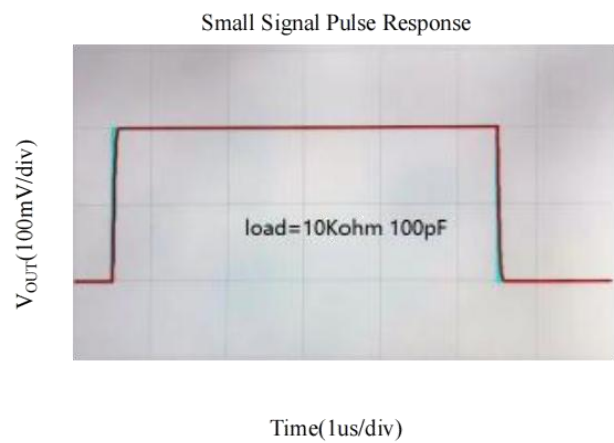
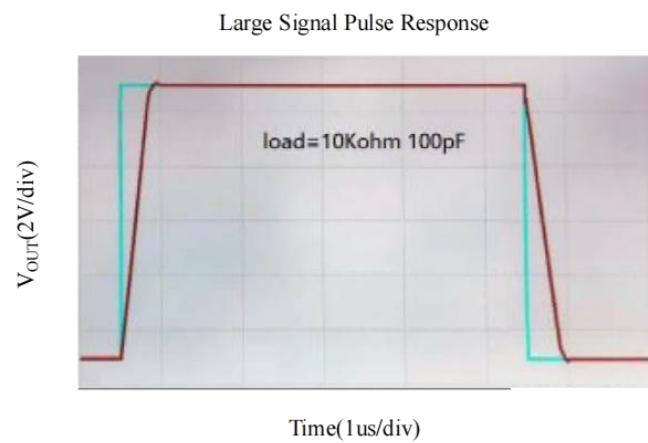
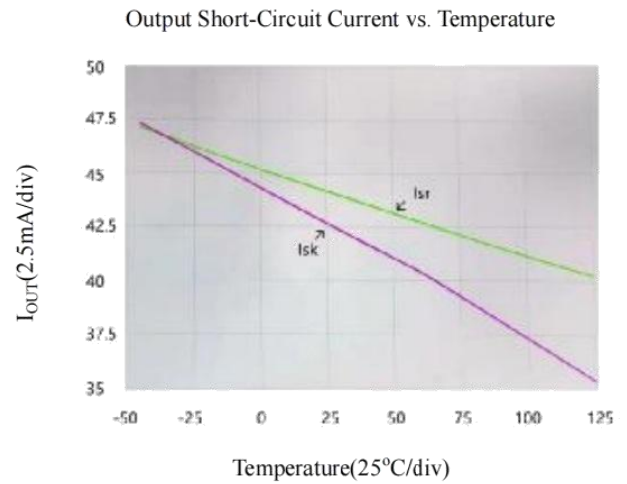
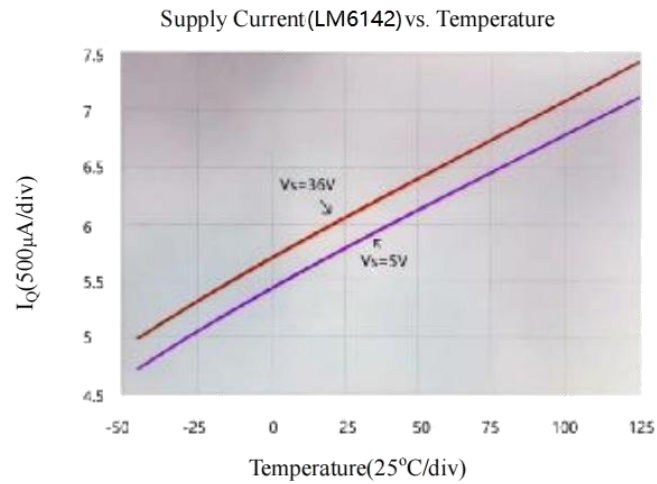
## Electrical Characteristics

(All test condition is  $V_S = 30V$ ,  $T_A = 25^\circ C$ ,  $R_L = \infty$ , unless otherwise noted.)

PARAMETER	SYMBOL	CONDITIONS	LM6142/6144			
			TYP	MIN	MAX	UNITS
INPUT CHARACTERISTICS						
Input Offset Voltage	V <sub>OS</sub>	V <sub>CM</sub> = V <sub>S</sub> /2	1.4	-100	100	μV
Input Bias Current	I <sub>B</sub>		100			pA
Input Offset Current	I <sub>OS</sub>		25			pA
Common-Mode Voltage Range	V <sub>CM</sub>	V <sub>S</sub> =30V	0 to (V <sub>S</sub> -1.5V)			V
Common-Mode Rejection Ratio	CMRR	V <sub>S</sub> = 30V, V <sub>CM</sub> = 0V to 28.5V	120	100		dB
Open-Loop Voltage Gain	A <sub>OL</sub>	V <sub>S</sub> =30V, R <sub>L</sub> = 10kΩ, V <sub>CM</sub> = 0V to 28.5V	130	100		dB
Input Offset Voltage Drift	ΔV <sub>OS</sub> /ΔT		2.0			μV/°C
OUTPUT CHARACTERISTICS						
Output Voltage Swing from Rail	V <sub>OH</sub>	V <sub>S</sub> =30V, R <sub>L</sub> = 10kΩ	29.85	29.65		V
	V <sub>OL</sub>		100		300	mV
	V <sub>OH</sub>	V <sub>S</sub> =30V, R <sub>L</sub> = 2kΩ	29.25	28.0		V
	V <sub>OL</sub>		500		1500	mV
Output Current	I <sub>SOURCE</sub>	V <sub>S</sub> =30V	39			mA
	I <sub>SINK</sub>		35			
POWER SUPPLY						
Operating Voltage Range			3.3			V
			36			V
Power Supply Rejection Ratio	PSRR	V <sub>S</sub> = +3.3V to +30V, V <sub>CM</sub> = +0.5V	120	100		dB
Quiescent Current / Amplifier	I <sub>Q</sub>		2.7			mA
DYNAMIC PERFORMANCE						
Gain-Bandwidth Product	GBP		11			MHz
Slew Rate	S <sub>R</sub>	G = +1, 5V Output Step	23			V/μs
NOISE PERFORMANCE						
Input Voltage Noise	e <sub>n</sub> p-p	f = 0.1Hz to 10Hz	3.0			μV <sub>RMS</sub>
Input Voltage Noise	e <sub>n</sub>	f = 1kHz	34			nV/√Hz
		f = 10kHz	13			

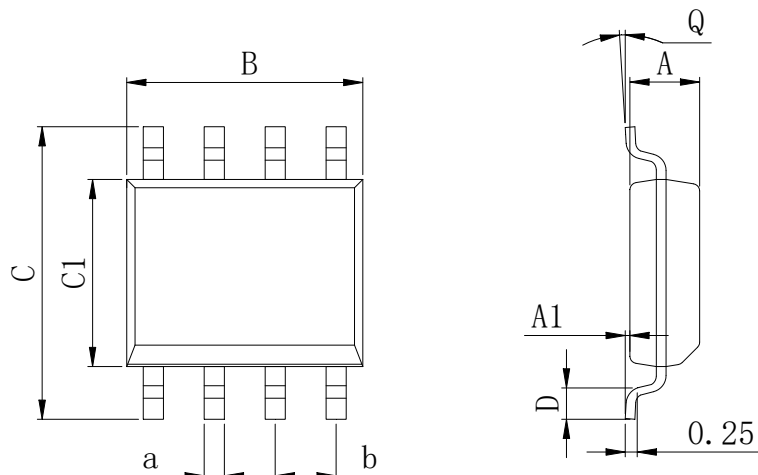
## Typical Performance Characteristics

$T_A = +25^\circ\text{C}$ ,  $V_S = +30\text{V}$ , and  $R_L = \infty$  connected to  $V_S/2$ , unless otherwise specified.



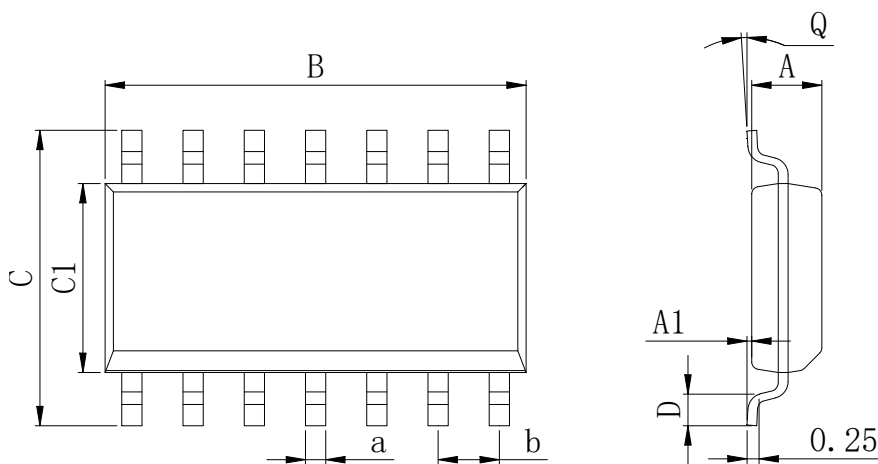
## Physical Dimensions

### SOP-8 (150mil)



Dimensions In Millimeters(SOP-8)									
Symbol:	A	A1	B	C	C1	D	Q	a	b
Min:	1.35	0.05	4.90	5.80	3.80	0.40	0°	0.35	1.27 BSC
Max:	1.55	0.20	5.10	6.20	4.00	0.80	8°	0.45	

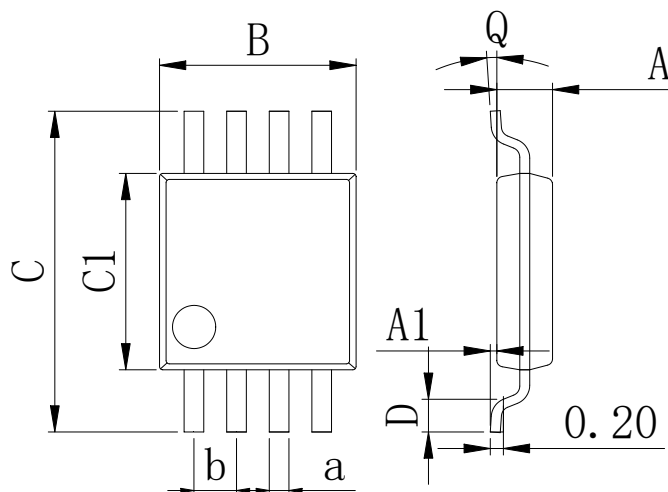
### SOP-14



Dimensions In Millimeters(SOP-14)									
Symbol:	A	A1	B	C	C1	D	Q	a	b
Min:	1.35	0.05	8.55	5.80	3.80	0.40	0°	0.35	1.27 BSC
Max:	1.55	0.20	8.75	6.20	4.00	0.80	8°	0.45	

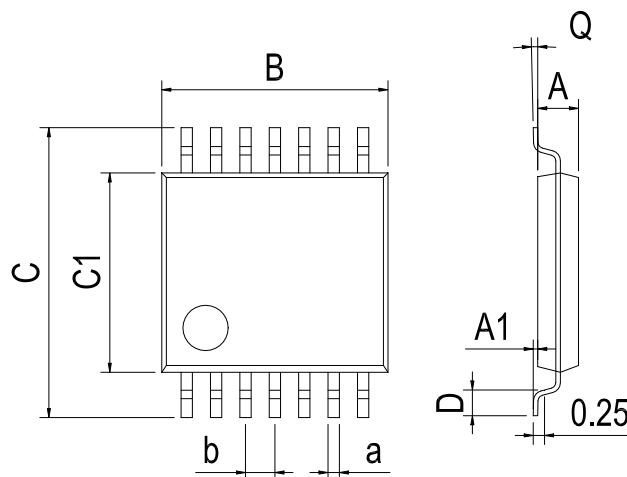
## Physical Dimensions

### MSOP-8



Dimensions In Millimeters(MSOP-8)									
Symbol:	A	A1	B	C	C1	D	Q	a	b
Min:	0.80	0.05	2.90	4.75	2.90	0.35	0°	0.25	0.65 BSC
Max:	0.90	0.20	3.10	5.05	3.10	0.75	8°	0.35	

### TSSOP-14



Dimensions In Millimeters(TSSOP-14)									
Symbol:	A	A1	B	C	C1	D	Q	a	b
Min:	0.85	0.05	4.90	6.20	4.30	0.40	0°	0.20	0.65 BSC
Max:	0.95	0.20	5.10	6.60	4.50	0.80	8°	0.25	

## Revision History

DATE	REVISION	PAGE
2017-1-16	New	1-9



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