



THE DATASHEET OF LMV824PWR



LOW-VOLTAGE RAIL-TO-RAIL OUTPUT OPERATIONAL AMPLIFIERS

Check for Samples: [LMV821 SINGLE](#), [LMV822 DUAL](#), [LMV824 QUAD](#)

FEATURES

- **2.5-V, 2.7-V, and 5-V Performance**
- **–40°C to 125°C Operation**
- **No Crossover Distortion**
- **Low Supply Current at $V_{CC+} = 5\text{ V}$:**
 - LMV821...0.3 mA Typ
 - LMV822...0.5 mA Typ
 - LMV824...1 mA Typ
- **Rail-to-Rail Output Swing**
- **Gain Bandwidth of 5.5 MHz Typ at 5 V**
- **Slew Rate of 1.9 V/ μs Typ at 5 V**

The LMV8xx devices are characterized for operation from –40°C to 85°C. The LMV8xxl devices are characterized for operation from –40°C to 125°C.

DESCRIPTION/ ORDERING INFORMATION

The LMV821 single, LMV822 dual, and LMV824 quad devices are low-voltage (2.5 V to 5.5 V), low-power commodity operational amplifiers. Electrical characteristics are very similar to the LMV3xx operational amplifiers (low supply current, rail-to-rail outputs, input common-mode range that includes ground). However, the LMV8xx devices offer a higher bandwidth (5.5 MHz typical) and faster slew rate (1.9 V/ μs typical).

The LMV8xx devices are cost-effective solutions for applications requiring low-voltage/low-power operation and space-saving considerations. The LMV821 is available in the ultra-small DCK package, which is approximately half the size of SOT-23-5. The DCK package saves space on printed circuit boards and enables the design of small portable electronic devices (cordless and cellular phones, laptops, PDAs, PCMIA). It also allows the designer to place the device closer to the signal source to reduce noise pickup and increase signal integrity.

**LMV824 . . . D, DGV, OR PW PACKAGE
(TOP VIEW)**



**LMV822 . . . D OR DGK PACKAGE
(TOP VIEW)**



**LMV821 . . . DBV OR DCK PACKAGE
(TOP VIEW)**



Please be aware that an important notice concerning availability, standard warranty, and use in critical applications of Texas Instruments semiconductor products and disclaimers thereto appears at the end of this data sheet.

LMV821 SINGLE, LMV822 DUAL, LMV824 QUAD

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ORDERING INFORMATION

| T _A | PACKAGE ⁽¹⁾ | | ORDERABLE PART NUMBER | TOP-SIDE MARKING ⁽²⁾ | |
|----------------|------------------------|------------------|-----------------------|---------------------------------|---------|
| -40°C to 85°C | Single | SC-70 – DCK | Reel of 3000 | LMV821DCKR | RY_ |
| | | | Reel of 250 | LMV821DCKT | |
| | | SOT-23 – DBV | Reel of 3000 | LMV821DBVR | RB8_ |
| | | | Reel of 250 | LMV821DBVT | |
| | Dual | SOIC – D | Tube of 75 | LMV822D | MV822 |
| | | | Reel of 2500 | LMV822DR | |
| | | MSOP/VSSOP – DGK | Tube of 100 | LMV822DGK | RA_ |
| | | | Reel of 2500 | LMV822DGKR | |
| | Quad | SOIC – D | Tube of 50 | LMV824D | LMV824 |
| | | | Reel of 2500 | LMV824DR | |
| | | TSSOP – PW | Tube of 90 | LMV824PW | MV824 |
| | | | Reel of 2000 | LMV824PWR | |
| TVSOP – DGV | | Reel of 2000 | LMV824DGVR | MV824 | |
| | | | | | |
| -40°C to 125°C | Single | SC-70 – DCK | Reel of 3000 | LMV821IDCKR | RZ_ |
| | | | Reel of 250 | LMV821IDCKT | |
| | | SOT-23 – DBV | Reel of 3000 | LMV821IDBVR | RB1_ |
| | | | Reel of 250 | LMV821IDBVT | |
| | Dual | SOIC – D | Tube of 75 | LMV822ID | MV822I |
| | | | Reel of 2500 | LMV822IDR | |
| | | MSOP/VSSOP – DGK | Tube of 100 | LMV822IDGK | R8_ |
| | | | Reel of 2500 | LMV822IDGKR | |
| | Quad | SOIC – D | Tube of 50 | LMV824ID | LMV824I |
| | | | Reel of 2500 | LMV824IDR | |
| | | TSSOP – PW | Tube of 90 | LMV824IPW | MV824I |
| | | | Reel of 2000 | LMV824IPWR | |
| TVSOP – DGV | | Reel of 2000 | LMV824IDGVR | MV824I | |
| | | | | | |

(1) Package drawings, standard packing quantities, thermal data, symbolization, and PCB design guidelines are available at www.ti.com/sc/package.

(2) DBV/DCK/DGK: The actual top-side marking has one additional character that designates the assembly/test site.

Figure 1. SYMBOL (EACH AMPLIFIER)

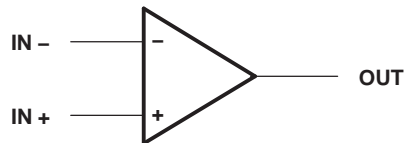
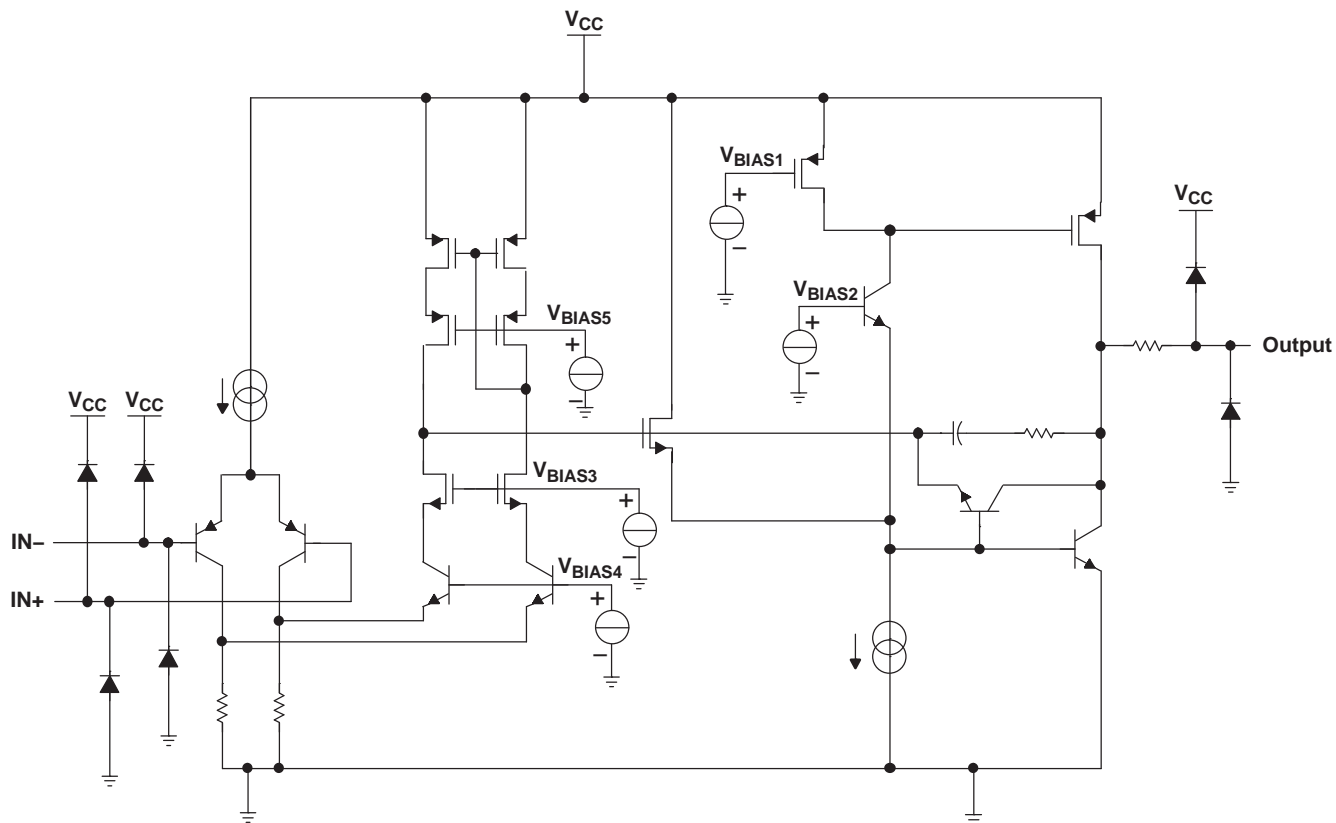


Figure 2. LMV824 SIMPLIFIED SCHEMATIC



LMV821 SINGLE, LMV822 DUAL, LMV824 QUAD

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Absolute Maximum Ratings⁽¹⁾

over operating free-air temperature range (unless otherwise noted)

| | | MIN | MAX | UNIT | |
|------------------|---|--|------------------|-----------|------|
| V _{CC} | Supply voltage ⁽²⁾ | | 5.5 | V | |
| V _{ID} | Differential input voltage ⁽³⁾ | | ±V _{CC} | V | |
| V _I | Input voltage range (either input) | V _{CC-} | V _{CC+} | V | |
| | Duration of output short circuit (one amplifier) to ground ⁽⁴⁾ | At or below T _A = 25°C, V _{CC} ≤ 5.5 V | | Unlimited | |
| θ _{JA} | Package thermal impedance ^{(5) (6)} | D package | 8 pin | 97 | °C/W |
| | | | 14 pin | 86 | |
| | | DBV package | 206 | | |
| | | DCK package | 252 | | |
| | | DGK package | 172 | | |
| | | DGV package | 127 | | |
| | | PW package | 113 | | |
| T _J | Operating virtual junction temperature | | 150 | °C | |
| T _{stg} | Storage temperature range | -65 | 150 | °C | |

- (1) Stresses beyond those listed under “absolute maximum ratings” may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under “recommended operating conditions” is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.
- (2) All voltage values (except differential voltages and V_{CC} specified for the measurement of I_{OS}) are with respect to the network GND.
- (3) Differential voltages are at IN+ with respect to IN-.
- (4) Short circuits from outputs to V_{CC} can cause excessive heating and eventual destruction.
- (5) Maximum power dissipation is a function of T_{J(max)}, θ_{JA}, and T_A. The maximum allowable power dissipation at any allowable ambient temperature is P_D = (T_{J(max)} – T_A)/θ_{JA}. Operating at the absolute maximum T_J of 150°C can affect reliability.
- (6) The package thermal impedance is calculated in accordance with JESD 51-7.

Recommended Operating Conditions

| | | MIN | MAX | UNIT |
|-----------------|--|---------|-----|------|
| V _{CC} | Supply voltage (single-supply operation) | 2.5 | 5 | V |
| T _A | Operating free-air temperature | LMV8xxl | 125 | °C |
| | | LMV8xx | 85 | |

LMV8xx 2.5-V Electrical Characteristics
 $V_{CC+} = 2.5\text{ V}$, $V_{CC-} = 0\text{ V}$, $V_{IC} = 1\text{ V}$, $V_O = 1.25\text{ V}$, and $R_L > 1\text{ M}\Omega$ (unless otherwise noted)

| PARAMETER | TEST CONDITIONS | | T_A | LMV8xx | | | UNIT |
|-------------------------------|---|------------|---------------|--------|------|-----|------|
| | | | | MIN | TYP | MAX | |
| V_{IO} Input offset voltage | | | 25°C | | 1 | 3.5 | mV |
| | | | -40°C to 85°C | | | 4 | |
| V_O Output swing | $V_{CC+} = 2.5\text{ V}$, $R_L = 600\ \Omega$ to 1.25 V | High level | 25°C | 2.3 | 2.37 | V | |
| | | | -40°C to 85°C | 2.2 | | | |
| | | Low level | 25°C | | 0.13 | | 0.2 |
| | | | -40°C to 85°C | | | | 0.3 |
| | $V_{CC+} = 2.5\text{ V}$, $R_L = 2\text{ k}\Omega$ to 1.25 V | High level | 25°C | 2.4 | 2.46 | | |
| | | | -40°C to 85°C | 2.3 | | | |
| | | Low level | 25°C | | 0.08 | | 0.12 |
| | | | -40°C to 85°C | | | | 0.2 |

LMV8xxI 2.5-V Electrical Characteristics
 $V_{CC+} = 2.5\text{ V}$, $V_{CC-} = 0\text{ V}$, $V_{IC} = 1\text{ V}$, $V_O = 1.25\text{ V}$, and $R_L > 1\text{ M}\Omega$ (unless otherwise noted)

| PARAMETER | TEST CONDITIONS | | T_A | LMV8xxI | | | UNIT |
|-------------------------------|---|------------|----------------|---------|------|-----|------|
| | | | | MIN | TYP | MAX | |
| V_{IO} Input offset voltage | | | 25°C | | 1 | 3.5 | mV |
| | | | -40°C to 125°C | | | 5.5 | |
| V_O Output swing | $V_{CC+} = 2.5\text{ V}$, $R_L = 600\ \Omega$ to 1.25 V | High level | 25°C | 2.28 | 2.37 | V | |
| | | | -40°C to 125°C | 2.18 | | | |
| | | Low level | 25°C | | 0.13 | | 0.22 |
| | | | -40°C to 125°C | | | | 0.32 |
| | $V_{CC+} = 2.5\text{ V}$, $R_L = 2\text{ k}\Omega$ to 1.25 V | High level | 25°C | 2.38 | 2.46 | | |
| | | | -40°C to 125°C | 2.28 | | | |
| | | Low level | 25°C | | 0.08 | | 0.14 |
| | | | -40°C to 125°C | | | | 0.22 |

LMV821 SINGLE, LMV822 DUAL, LMV824 QUAD

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LMV8xx 2.7-V Electrical Characteristics

$V_{CC+} = 2.7\text{ V}$, $V_{CC-} = 0\text{ V}$, $V_{IC} = 1\text{ V}$, $V_O = 1.35\text{ V}$, and $R_L > 1\text{ M}\Omega$ (unless otherwise noted)

| PARAMETER | TEST CONDITIONS | | T_A | LMV8xx | | | UNIT |
|--|--|------------|---------------|-------------|-----------|------------------------------|------|
| | | | | MIN | TYP | MAX | |
| V_{IO} Input offset voltage | | | 25°C | 1 | 3.5 | mV | |
| | | | -40°C to 85°C | | 4 | | |
| α_{VIO} Average temperature coefficient of input offset voltage | | | 25°C | 1 | | $\mu\text{V}/^\circ\text{C}$ | |
| I_{IB} Input bias current | | | 25°C | 30 | 90 | nA | |
| | | | -40°C to 85°C | | 140 | | |
| I_{IO} Input offset current | | | 25°C | 0.5 | 30 | nA | |
| | | | -40°C to 85°C | | 50 | | |
| CMRR Common-mode rejection ratio | $V_{IC} = 0$ to 1.7 V | | 25°C | 70 | 85 | dB | |
| | | | -40°C to 85°C | 68 | | | |
| + k_{SVR} Positive supply-voltage rejection ratio | $V_{CC+} = 1.7\text{ V}$ to 4 V, $V_{CC-} = -1\text{ V}$, $V_O = 0$, $V_{IC} = 0$ | | 25°C | 75 | 85 | dB | |
| | | | -40°C to 85°C | 70 | | | |
| - k_{SVR} Negative supply-voltage rejection ratio | $V_{CC+} = 1.7\text{ V}$, $V_{CC-} = -1\text{ V}$ to -3.3 V, $V_O = 0$, $V_{IC} = 0$ | | 25°C | 73 | 85 | dB | |
| | | | -40°C to 85°C | 70 | | | |
| V_{ICR} Common-mode input voltage range | CMRR ≥ 50 dB | | 25°C | -0.2 to 1.9 | -0.3 to 2 | V | |
| A_V Large-signal voltage amplification | $R_L = 600\ \Omega$ to 1.35 V, $V_O = 1.35\text{ V}$ to 2.2 V | Sourcing | 25°C | 90 | 100 | dB | |
| | | | -40°C to 85°C | 85 | | | |
| | | Sinking | 25°C | 85 | 90 | | |
| | | | -40°C to 85°C | 80 | | | |
| | $R_L = 2\text{ k}\Omega$ to 1.35 V, $V_O = 1.35\text{ V}$ to 2.2 V | Sourcing | 25°C | 95 | 100 | | |
| | | | -40°C to 85°C | 90 | | | |
| | | Sinking | 25°C | 90 | 95 | | |
| | | | -40°C to 85°C | 85 | | | |
| V_O Output swing | $V_{CC+} = 2.7\text{ V}$, $R_L = 600\ \Omega$ to 1.35 V | High level | 25°C | 2.5 | 2.58 | V | |
| | | | -40°C to 85°C | 2.4 | | | |
| | | Low level | 25°C | 0.13 | 0.2 | | |
| | | | -40°C to 85°C | 0.3 | | | |
| | $V_{CC+} = 2.7\text{ V}$, $R_L = 2\text{ k}\Omega$ to 1.35 V | High level | 25°C | 2.6 | 2.66 | | |
| | | | -40°C to 85°C | 2.5 | | | |
| | | Low level | 25°C | 0.08 | 0.12 | | |
| | | | -40°C to 85°C | 0.2 | | | |
| I_O Output current | $V_O = 0\text{ V}$ | Sourcing | 25°C | 12 | 16 | mA | |
| | $V_O = 2.7\text{ V}$ | Sinking | 25°C | 12 | 26 | | |
| I_{CC} Supply current | LMV821 | | 25°C | 0.22 | 0.3 | mA | |
| | | | -40°C to 85°C | | 0.5 | | |
| | | | 25°C | 0.45 | 0.6 | | |
| | | | -40°C to 85°C | | 0.8 | | |
| | LMV822 (both amplifiers) | | 25°C | 0.72 | 1 | | |
| | | | -40°C to 85°C | | 1.2 | | |
| | | | 25°C | 0.72 | 1 | | |
| | | | -40°C to 85°C | | 1.2 | | |

LMV8xx 2.7-V Electrical Characteristics (continued)
 $V_{CC+} = 2.7\text{ V}$, $V_{CC-} = 0\text{ V}$, $V_{IC} = 1\text{ V}$, $V_O = 1.35\text{ V}$, and $R_L > 1\text{ M}\Omega$ (unless otherwise noted)

| PARAMETER | | TEST CONDITIONS | T_A | LMV8xx | | | UNIT |
|-----------|----------------------------------|---|-------|--------|------|-----|------------------------|
| | | | | MIN | TYP | MAX | |
| SR | Slew rate ⁽¹⁾ | | 25°C | | 1.7 | | V/ μ s |
| GBW | Gain bandwidth product | ⁽²⁾ | 25°C | | 5 | | MHz |
| Φ_m | Phase margin | ⁽²⁾ | 25°C | | 60 | | deg |
| | Gain margin | ⁽²⁾ | 25°C | | 8.6 | | dB |
| | Amplifier-to-amplifier isolation | $V_{CC+} = 5\text{ V}$, $R_L = 100\text{ k}\Omega$ to 2.5 V ⁽³⁾ | 25°C | | 135 | | dB |
| V_n | Equivalent input noise voltage | $f = 1\text{ kHz}$, $V_{IC} = 1\text{ V}$ | 25°C | | 45 | | nV/ $\sqrt{\text{Hz}}$ |
| I_n | Equivalent input noise current | $f = 1\text{ kHz}$ | 25°C | | 0.18 | | pA/ $\sqrt{\text{Hz}}$ |
| THD | Total harmonic distortion | $f = 1\text{ kHz}$, $A_V = -2$, $R_L = 10\text{ k}\Omega$, $V_O = 4.1\text{ V}_{p-p}$ | 25°C | | 0.01 | | % |

(1) Connected as voltage follower with 1-V step input. Value specified is the slower of the positive and negative slew rates.

(2) 40-dB closed-loop dc gain, $C_L = 22\text{ pF}$

(3) Each amplifier excited in turn with 1 kHz to produce $V_O = 3\text{ V}_{p-p}$

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LMV8xxI 2.7-V Electrical Characteristics

$V_{CC+} = 2.7\text{ V}$, $V_{CC-} = 0\text{ V}$, $V_{IC} = 1\text{ V}$, $V_O = 1.35\text{ V}$, and $R_L > 1\text{ M}\Omega$ (unless otherwise noted)

| PARAMETER | TEST CONDITIONS | | T_A | LMV8xxI | | | UNIT |
|--|--|------------|----------------|-------------|-----------|------------------------------|------|
| | | | | MIN | TYP | MAX | |
| V_{IO} Input offset voltage | | | 25°C | 1 | 3.5 | mV | |
| | | | -40°C to 125°C | | 5.5 | | |
| α_{VIO} Average temperature coefficient of input offset voltage | | | 25°C | 1 | | $\mu\text{V}/^\circ\text{C}$ | |
| I_{IB} Input bias current | | | 25°C | 30 | 90 | nA | |
| | | | -40°C to 125°C | | 140 | | |
| I_{IO} Input offset current | | | 25°C | 0.5 | 30 | nA | |
| | | | -40°C to 125°C | | 50 | | |
| CMRR Common-mode rejection ratio | $V_{IC} = 0\text{ to }1.7\text{ V}$ | | 25°C | 70 | 85 | dB | |
| | | | -40°C to 125°C | 68 | | | |
| + k_{SVR} Positive supply-voltage rejection ratio | $V_{CC+} = 1.7\text{ V to }4\text{ V}$, $V_{CC-} = -1\text{ V}$, $V_O = 0$, $V_{IC} = 0$ | | 25°C | 75 | 85 | dB | |
| | | | -40°C to 125°C | 70 | | | |
| - k_{SVR} Negative supply-voltage rejection ratio | $V_{CC+} = 1.7\text{ V}$, $V_{CC-} = -1\text{ V to }-3.3\text{ V}$, $V_O = 0$, $V_{IC} = 0$ | | 25°C | 73 | 85 | dB | |
| | | | -40°C to 125°C | 70 | | | |
| V_{ICR} Common-mode input voltage range | CMRR $\geq 50\text{ dB}$ | | 25°C | -0.2 to 1.9 | -0.3 to 2 | V | |
| A_V Large-signal voltage amplification | $R_L = 600\ \Omega\text{ to }1.35\text{ V}$, $V_O = 1.35\text{ V to }2.2\text{ V}$ | Sourcing | 25°C | 90 | 100 | dB | |
| | | | -40°C to 125°C | 85 | | | |
| | | Sinking | 25°C | 85 | 90 | | |
| | | | -40°C to 125°C | 80 | | | |
| | $R_L = 2\text{ k}\Omega\text{ to }1.35\text{ V}$, $V_O = 1.35\text{ V to }2.2\text{ V}$ | Sourcing | 25°C | 95 | 100 | | |
| | | | -40°C to 125°C | 90 | | | |
| | | Sinking | 25°C | 90 | 95 | | |
| | | | -40°C to 125°C | 85 | | | |
| V_O Output swing | $V_{CC+} = 2.7\text{ V}$, $R_L = 600\ \Omega\text{ to }1.35\text{ V}$ | High level | 25°C | 2.5 | 2.58 | V | |
| | | | -40°C to 125°C | 2.4 | | | |
| | | Low level | 25°C | 0.13 | 0.2 | | |
| | | | -40°C to 125°C | | 0.3 | | |
| | $V_{CC+} = 2.7\text{ V}$, $R_L = 2\text{ k}\Omega\text{ to }1.35\text{ V}$ | High level | 25°C | 2.6 | 2.66 | | |
| | | | -40°C to 125°C | 2.5 | | | |
| | | Low level | 25°C | 0.08 | 0.12 | | |
| | | | -40°C to 125°C | | 0.2 | | |
| I_O Output current | $V_O = 0\text{ V}$ | Sourcing | 25°C | 12 | 16 | mA | |
| | $V_O = 2.7\text{ V}$ | Sinking | 25°C | 12 | 26 | | |
| I_{CC} Supply current | LMV821 | | 25°C | 0.22 | 0.3 | mA | |
| | | | -40°C to 125°C | | 0.5 | | |
| | | | 25°C | 0.45 | 0.6 | | |
| | | | -40°C to 125°C | | 0.8 | | |
| | LMV822 (both amplifiers) | | 25°C | 0.72 | 1 | | |
| | | | -40°C to 125°C | | 1.2 | | |
| | | | 25°C | 0.72 | 1 | | |
| | | | -40°C to 125°C | | 1.2 | | |

LMV8xxI 2.7-V Electrical Characteristics (continued)
 $V_{CC+} = 2.7\text{ V}$, $V_{CC-} = 0\text{ V}$, $V_{IC} = 1\text{ V}$, $V_O = 1.35\text{ V}$, and $R_L > 1\text{ M}\Omega$ (unless otherwise noted)

| PARAMETER | | TEST CONDITIONS | T_A | LMV8xxI | | | UNIT |
|-----------|----------------------------------|---|-------|---------|-----|-----|------------------------|
| | | | | MIN | TYP | MAX | |
| SR | Slew rate ⁽¹⁾ | | 25°C | 1.7 | | | V/ μ s |
| GBW | Gain bandwidth product | ⁽²⁾ | 25°C | 5 | | | MHz |
| Φ_m | Phase margin | ⁽²⁾ | 25°C | 60 | | | deg |
| | Gain margin | ⁽²⁾ | 25°C | 8.6 | | | dB |
| | Amplifier-to-amplifier isolation | $V_{CC+} = 5\text{ V}$, $R_L = 100\text{ k}\Omega$ to 2.5 V ⁽³⁾ | 25°C | 135 | | | dB |
| V_n | Equivalent input noise voltage | $f = 1\text{ kHz}$, $V_{IC} = 1\text{ V}$ | 25°C | 45 | | | nV/ $\sqrt{\text{Hz}}$ |
| I_n | Equivalent input noise current | $f = 1\text{ kHz}$ | 25°C | 0.18 | | | pA/ $\sqrt{\text{Hz}}$ |
| THD | Total harmonic distortion | $f = 1\text{ kHz}$, $A_V = -2$, $R_L = 10\text{ k}\Omega$, $V_O = 4.1\text{ V}_{p-p}$ | 25°C | 0.01 | | | % |

(1) Connected as voltage follower with 1-V step input. Value specified is the slower of the positive and negative slew rates.

(2) 40-dB closed-loop dc gain, $C_L = 22\text{ pF}$

(3) Each amplifier excited in turn with 1 kHz to produce $V_O = 3\text{ V}_{p-p}$

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LMV8xx 5-V Electrical Characteristics

$V_{CC+} = 5\text{ V}$, $V_{CC-} = 0\text{ V}$, $V_{IC} = 2\text{ V}$, $V_O = 2.5\text{ V}$, and $R_L > 1\text{ M}\Omega$ (unless otherwise noted)

| PARAMETER | TEST CONDITIONS | | T_A | LMV8xx | | | UNIT |
|--|--|------------|---------------|-------------|-------------|------------------------------|------|
| | | | | MIN | TYP | MAX | |
| V_{IO} Input offset voltage | | | 25°C | 1 | 3.5 | mV | |
| | | | -40°C to 85°C | | 4 | | |
| α_{VIO} Average temperature coefficient of input offset voltage | | | 25°C | 1 | | $\mu\text{V}/^\circ\text{C}$ | |
| I_{IB} Input bias current | | | 25°C | 40 | 100 | nA | |
| | | | -40°C to 85°C | | 150 | | |
| I_{IO} Input offset current | | | 25°C | 0.5 | 30 | nA | |
| | | | -40°C to 85°C | | 50 | | |
| CMRR Common-mode rejection ratio | $V_{IC} = 0\text{ to }4\text{ V}$ | | 25°C | 72 | 90 | dB | |
| | | | -40°C to 85°C | 70 | | | |
| + k_{SVR} Positive supply-voltage rejection ratio | $V_{CC+} = 1.7\text{ V to }4\text{ V}$, $V_{CC-} = -1\text{ V}$, $V_O = 0$, $V_{IC} = 0$ | | 25°C | 75 | 85 | dB | |
| | | | -40°C to 85°C | 70 | | | |
| - k_{SVR} Negative supply-voltage rejection ratio | $V_{CC+} = 1.7\text{ V}$, $V_{CC-} = -1\text{ V to }-3.3\text{ V}$, $V_O = 0$, $V_{IC} = 0$ | | 25°C | 73 | 85 | dB | |
| | | | -40°C to 85°C | 70 | | | |
| V_{ICR} Common-mode input voltage range | CMRR $\geq 50\text{ dB}$ | | 25°C | -0.2 to 4.2 | -0.3 to 4.3 | V | |
| A_V Large-signal voltage amplification | $R_L = 600\ \Omega\text{ to }2.5\text{ V}$, $V_O = 2.5\text{ V to }4.5\text{ V}$ | Sourcing | 25°C | 95 | 105 | dB | |
| | | | -40°C to 85°C | 90 | | | |
| | | Sinking | 25°C | 95 | 105 | | |
| | | | -40°C to 85°C | 90 | | | |
| | $R_L = 2\text{ k}\Omega\text{ to }2.5\text{ V}$, $V_O = 2.5\text{ V to }4.5\text{ V}$ | Sourcing | 25°C | 95 | 105 | | |
| | | | -40°C to 85°C | 90 | | | |
| | | Sinking | 25°C | 95 | 105 | | |
| | | | -40°C to 85°C | 90 | | | |
| V_O Output swing | $V_{CC+} = 5\text{ V}$, $R_L = 600\ \Omega\text{ to }2.5\text{ V}$ | High level | 25°C | 4.75 | 4.84 | V | |
| | | | -40°C to 85°C | 4.7 | | | |
| | | Low level | 25°C | 0.17 | 0.25 | | |
| | | | -40°C to 85°C | 0.3 | | | |
| | $V_{CC+} = 5\text{ V}$, $R_L = 2\text{ k}\Omega\text{ to }2.5\text{ V}$ | High level | 25°C | 4.85 | 4.9 | | |
| | | | -40°C to 85°C | 4.8 | | | |
| | | Low level | 25°C | 0.1 | 0.15 | | |
| | | | -40°C to 85°C | 0.2 | | | |
| I_O Output current | $V_O = 0\text{ V}$ | Sourcing | 25°C | 20 | 45 | mA | |
| | | | -40°C to 85°C | 15 | | | |
| | $V_O = 5\text{ V}$ | Sinking | 25°C | 20 | 40 | | |
| | | | -40°C to 85°C | 15 | | | |
| I_{CC} Supply current | LMV821 | | 25°C | 0.3 | 0.4 | mA | |
| | | | -40°C to 85°C | | 0.6 | | |
| | LMV822 (both amplifiers) | | 25°C | 0.5 | 0.7 | | |
| | | | -40°C to 85°C | | 0.9 | | |
| | LMV824 (all four amplifiers) | | 25°C | 1 | 1.3 | | |
| | | | -40°C to 85°C | | 1.5 | | |

LMV8xx 5-V Electrical Characteristics (continued)
 $V_{CC+} = 5\text{ V}$, $V_{CC-} = 0\text{ V}$, $V_{IC} = 2\text{ V}$, $V_O = 2.5\text{ V}$, and $R_L > 1\text{ M}\Omega$ (unless otherwise noted)

| PARAMETER | | TEST CONDITIONS | T_A | LMV8xx | | | UNIT |
|-----------|----------------------------------|---|-------|--------|------|-----|------------------------|
| | | | | MIN | TYP | MAX | |
| SR | Slew rate | $V_{CC+} = 5\text{ V}^{(1)}$ | 25°C | 1.4 | 1.9 | | V/ μ s |
| GBW | Gain bandwidth product | ⁽²⁾ | 25°C | | 5.5 | | MHz |
| Φ_m | Phase margin | ⁽²⁾ | 25°C | | 64.2 | | deg |
| | Gain margin | ⁽²⁾ | 25°C | | 8.7 | | dB |
| | Amplifier-to-amplifier isolation | $V_{CC+} = 5\text{ V}$, $R_L = 100\text{ k}\Omega$ to $2.5\text{ V}^{(3)}$ | 25°C | | 135 | | dB |
| V_n | Equivalent input noise voltage | $f = 1\text{ kHz}$, $V_{IC} = 1\text{ V}$ | 25°C | | 42 | | nV/ $\sqrt{\text{Hz}}$ |
| I_n | Equivalent input noise current | $f = 1\text{ kHz}$ | 25°C | | 0.2 | | pA/ $\sqrt{\text{Hz}}$ |
| THD | Total harmonic distortion | $f = 1\text{ kHz}$, $A_V = -2$, $R_L = 10\text{ k}\Omega$, $V_O = 4.1\text{ V}_{p-p}$ | 25°C | | 0.01 | | % |

(1) Connected as voltage follower with 3-V step input. Value specified is the slower of the positive and negative slew rates.

(2) 40-dB closed-loop dc gain, $C_L = 22\text{ pF}$

(3) Each amplifier excited in turn with 1 kHz to produce $V_O = 3\text{ V}_{p-p}$

LMV821 SINGLE, LMV822 DUAL, LMV824 QUAD

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LMV8xxI 5-V Electrical Characteristics

$V_{CC+} = 5\text{ V}$, $V_{CC-} = 0\text{ V}$, $V_{IC} = 2\text{ V}$, $V_O = 2.5\text{ V}$, and $R_L > 1\text{ M}\Omega$ (unless otherwise noted)

| PARAMETER | TEST CONDITIONS | | T_A | LMV8xxI | | | UNIT |
|--|--|----------------|----------------|-------------|-------------|------------------------------|------|
| | | | | MIN | TYP | MAX | |
| V_{IO} Input offset voltage | | | 25°C | 1 | 3.5 | mV | |
| | | | -40°C to 125°C | | 5.5 | | |
| α_{VIO} Average temperature coefficient of input offset voltage | | | 25°C | 1 | | $\mu\text{V}/^\circ\text{C}$ | |
| I_{IB} Input bias current | | | 25°C | 40 | 100 | nA | |
| | | | -40°C to 125°C | | 150 | | |
| I_{IO} Input offset current | | | 25°C | 0.5 | 30 | nA | |
| | | | -40°C to 125°C | | 50 | | |
| CMRR Common-mode rejection ratio | $V_{IC} = 0\text{ to }4\text{ V}$ | 25°C | 72 | 90 | dB | | |
| | | -40°C to 125°C | 70 | | | | |
| $+k_{SVR}$ Positive supply-voltage rejection ratio | $V_{CC+} = 1.7\text{ V to }4\text{ V}$, $V_{CC-} = -1\text{ V}$, $V_O = 0$, $V_{IC} = 0$ | 25°C | 75 | 85 | dB | | |
| | | -40°C to 125°C | 70 | | | | |
| $-k_{SVR}$ Negative supply-voltage rejection ratio | $V_{CC+} = 1.7\text{ V}$, $V_{CC-} = -1\text{ V to }-3.3\text{ V}$, $V_O = 0$, $V_{IC} = 0$ | 25°C | 73 | 85 | dB | | |
| | | -40°C to 125°C | 70 | | | | |
| V_{ICR} Common-mode input voltage range | CMRR $\geq 50\text{ dB}$ | | 25°C | -0.2 to 4.2 | -0.3 to 4.3 | V | |
| A_V Large-signal voltage amplification | $R_L = 600\ \Omega\text{ to }2.5\text{ V}$, $V_O = 2.5\text{ V to }4.5\text{ V}$ | Sourcing | 25°C | 95 | 105 | dB | |
| | | | -40°C to 125°C | 90 | | | |
| | $R_L = 600\ \Omega\text{ to }2.5\text{ V}$, $V_O = 2.5\text{ V to }0.5\text{ V}$ | Sinking | 25°C | 95 | 105 | | |
| | | | -40°C to 125°C | 90 | | | |
| | $R_L = 2\text{ k}\Omega\text{ to }2.5\text{ V}$, $V_O = 2.5\text{ V to }4.5\text{ V}$ | Sourcing | 25°C | 95 | 105 | | |
| | | | -40°C to 125°C | 90 | | | |
| | $R_L = 2\text{ k}\Omega\text{ to }2.5\text{ V}$, $V_O = 2.5\text{ V to }0.5\text{ V}$ | Sinking | 25°C | 95 | 105 | | |
| | | | -40°C to 125°C | 90 | | | |
| V_O Output swing | $V_{CC+} = 5\text{ V}$, $R_L = 600\ \Omega\text{ to }2.5\text{ V}$ | High level | 25°C | 4.75 | 4.84 | V | |
| | | | -40°C to 125°C | 4.6 | | | |
| | | Low level | 25°C | 0.17 | 0.25 | | |
| | | | -40°C to 125°C | 0.3 | | | |
| | $V_{CC+} = 5\text{ V}$, $R_L = 2\text{ k}\Omega\text{ to }2.5\text{ V}$ | High level | 25°C | 4.85 | 4.9 | | |
| | | | -40°C to 125°C | 4.8 | | | |
| | | Low level | 25°C | 0.1 | 0.15 | | |
| | | | -40°C to 125°C | 0.2 | | | |
| I_O Output current | $V_O = 0\text{ V}$ | Sourcing | 25°C | 20 | 45 | mA | |
| | | | -40°C to 125°C | 15 | | | |
| | $V_O = 5\text{ V}$ | Sinking | 25°C | 20 | 40 | | |
| | | | -40°C to 125°C | 15 | | | |
| I_{CC} Supply current | LMV821 | 25°C | 0.3 | 0.4 | mA | | |
| | | -40°C to 125°C | | 0.6 | | | |
| | LMV822 (both amplifiers) | 25°C | 0.5 | 0.7 | | | |
| | | -40°C to 125°C | | 0.9 | | | |
| | LMV824 (all four amplifiers) | 25°C | 1 | 1.3 | | | |
| | | -40°C to 125°C | | 1.5 | | | |

LMV8xxI 5-V Electrical Characteristics (continued)
 $V_{CC+} = 5\text{ V}$, $V_{CC-} = 0\text{ V}$, $V_{IC} = 2\text{ V}$, $V_O = 2.5\text{ V}$, and $R_L > 1\text{ M}\Omega$ (unless otherwise noted)

| PARAMETER | | TEST CONDITIONS | T_A | LMV8xxI | | | UNIT |
|-----------|----------------------------------|---|-------|---------|------|-----|------------------------|
| | | | | MIN | TYP | MAX | |
| SR | Slew rate | $V_{CC+} = 5\text{ V}^{(1)}$ | 25°C | 1.4 | 1.9 | | V/ μ s |
| GBW | Gain bandwidth product | ⁽²⁾ | 25°C | | 5.5 | | MHz |
| Φ_m | Phase margin | ⁽²⁾ | 25°C | | 64.2 | | deg |
| | Gain margin | ⁽²⁾ | 25°C | | 8.7 | | dB |
| | Amplifier-to-amplifier isolation | $V_{CC+} = 5\text{ V}$, $R_L = 100\text{ k}\Omega$ to $2.5\text{ V}^{(3)}$ | 25°C | | 135 | | dB |
| V_n | Equivalent input noise voltage | $f = 1\text{ kHz}$, $V_{IC} = 1\text{ V}$ | 25°C | | 42 | | nV/ $\sqrt{\text{Hz}}$ |
| I_n | Equivalent input noise current | $f = 1\text{ kHz}$ | 25°C | | 0.2 | | pA/ $\sqrt{\text{Hz}}$ |
| THD | Total harmonic distortion | $f = 1\text{ kHz}$, $A_V = -2$, $R_L = 10\text{ k}\Omega$, $V_O = 4.1\text{ V}_{p-p}$ | 25°C | | 0.01 | | % |

- (1) Connected as voltage follower with 3-V step input. Value specified is the slower of the positive and negative slew rates.
- (2) 40-dB closed-loop dc gain, $C_L = 22\text{ pF}$
- (3) Each amplifier excited in turn with 1 kHz to produce $V_O = 3\text{ V}_{p-p}$

TYPICAL CHARACTERISTICS

$T_A = 25^\circ\text{C}$, $V_{CC+} = 5\text{-V}$ Single Supply (Unless Otherwise Noted)

**SUPPLY CURRENT
vs
SUPPLY VOLTAGE**



Figure 3.

**INPUT CURRENT
vs
TEMPERATURE**

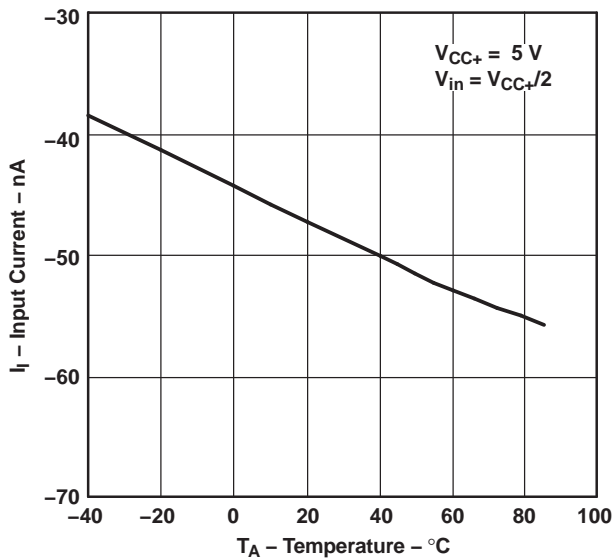


Figure 4.

**SOURCING CURRENT
vs
OUTPUT VOLTAGE**



Figure 5.

**SOURCING CURRENT
vs
OUTPUT VOLTAGE**

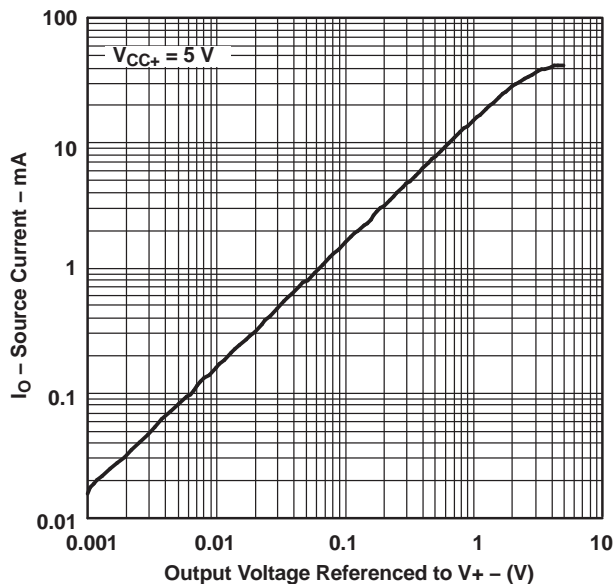


Figure 6.

TYPICAL CHARACTERISTICS (continued)

T_A = 25°C, V_{CC+} = 5-V Single Supply (Unless Otherwise Noted)

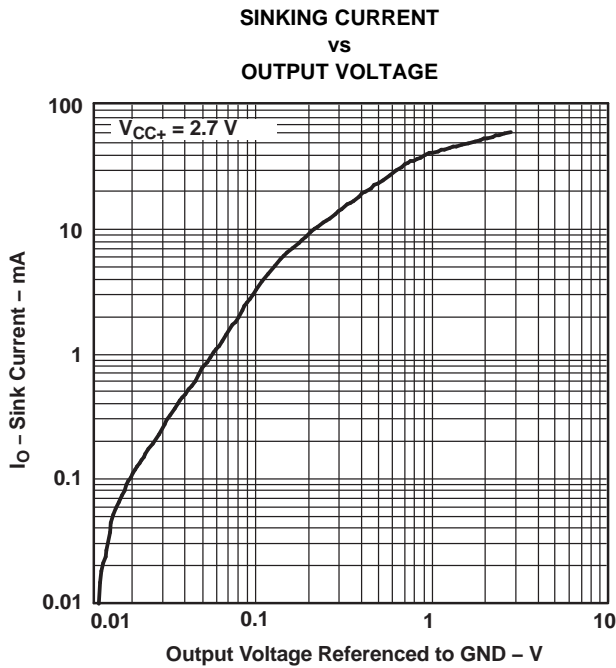


Figure 7.

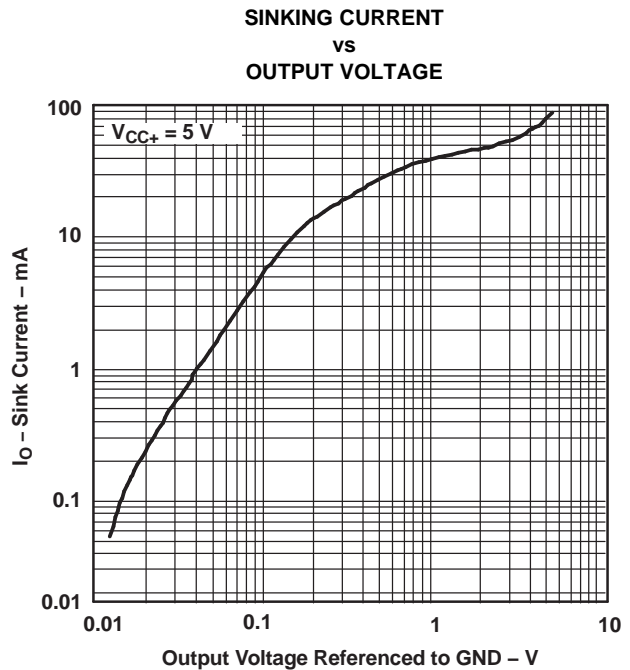


Figure 8.

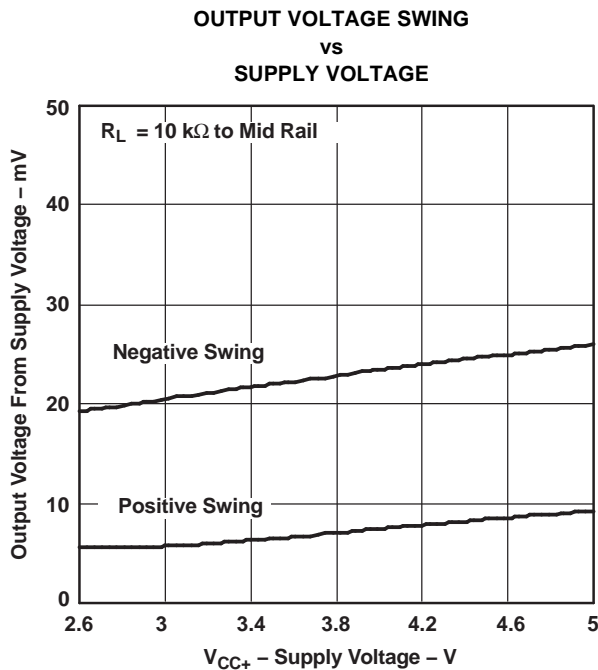


Figure 9.

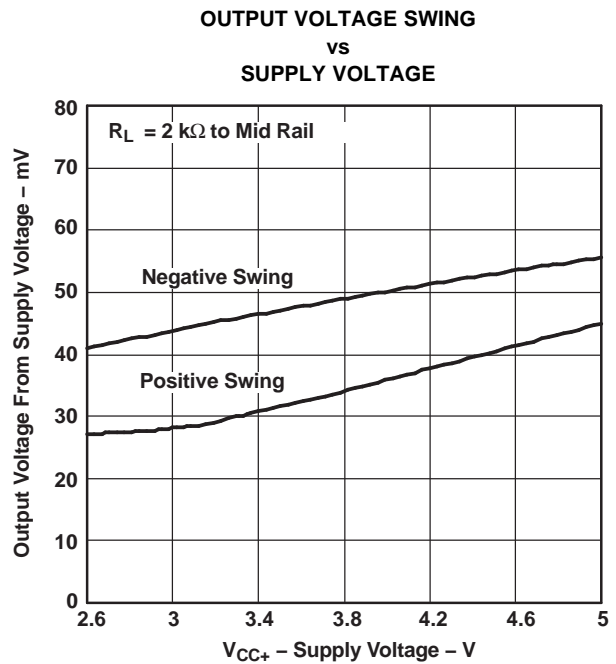


Figure 10.

LMV821 SINGLE, LMV822 DUAL, LMV824 QUAD

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TYPICAL CHARACTERISTICS (continued)

$T_A = 25^\circ\text{C}$, $V_{CC+} = 5\text{-V}$ Single Supply (Unless Otherwise Noted)

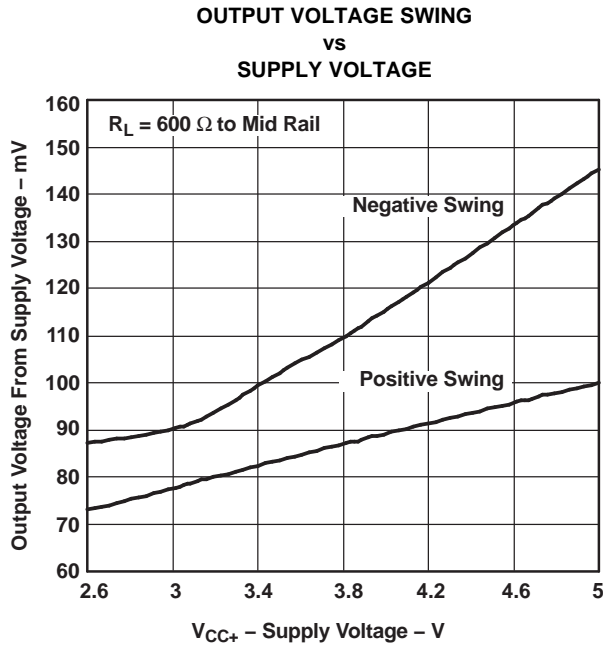


Figure 11.

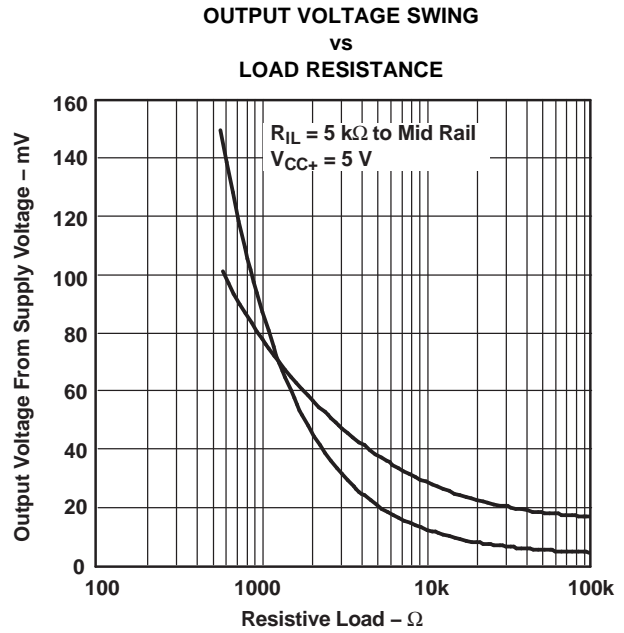


Figure 12.

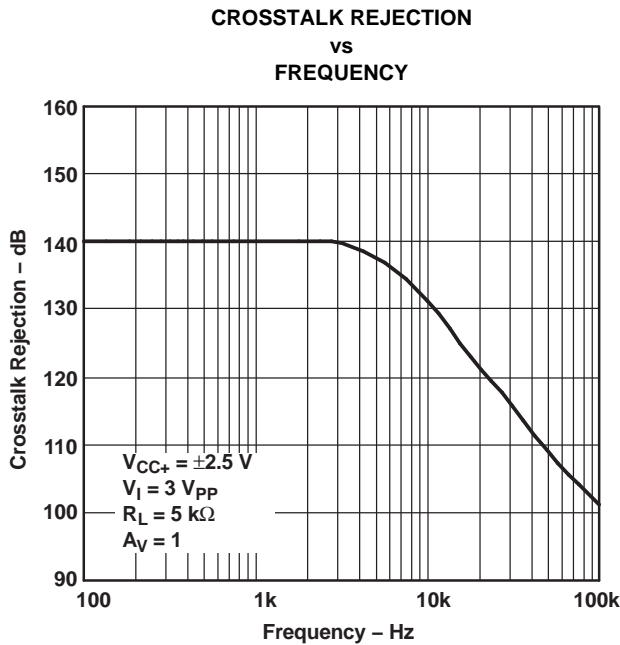


Figure 13.

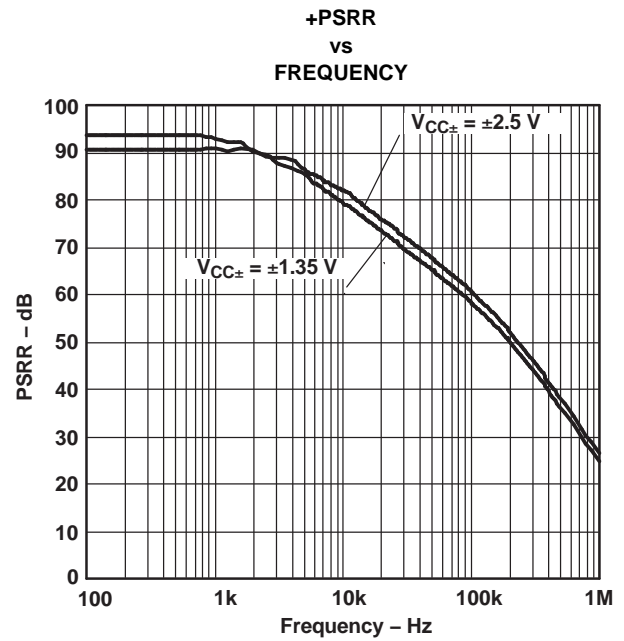


Figure 14.

TYPICAL CHARACTERISTICS (continued)

$T_A = 25^\circ\text{C}$, $V_{CC+} = 5\text{-V}$ Single Supply (Unless Otherwise Noted)



Figure 15.

GAIN AND PHASE MARGIN
vs
FREQUENCY
($V_{CC+} = 2.7\text{ V}$, $R_L = 600\ \Omega$, $2\text{ k}\Omega$, $100\text{ k}\Omega$)

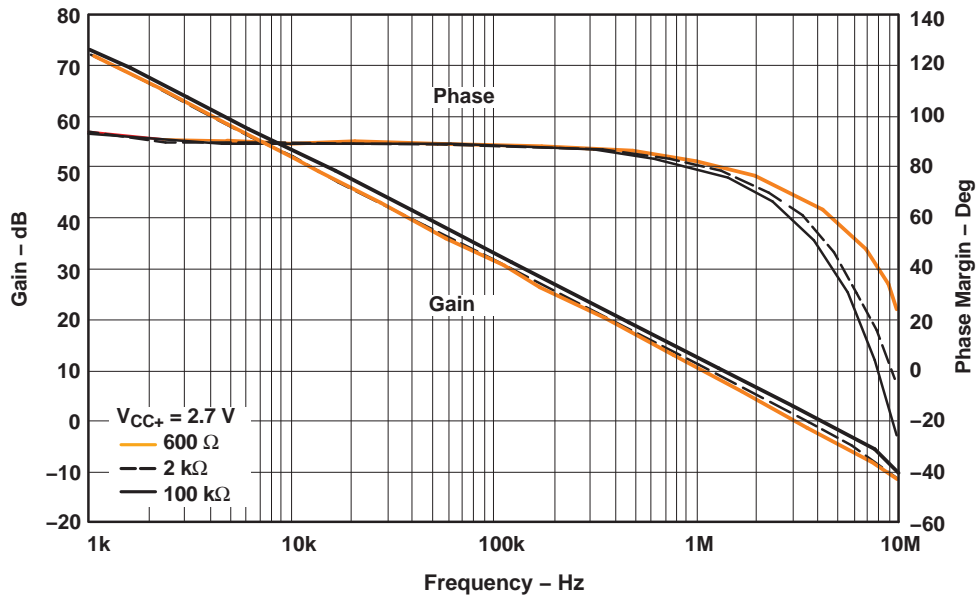


Figure 16.

TYPICAL CHARACTERISTICS (continued)

$T_A = 25^\circ\text{C}$, $V_{CC+} = 5\text{-V}$ Single Supply (Unless Otherwise Noted)

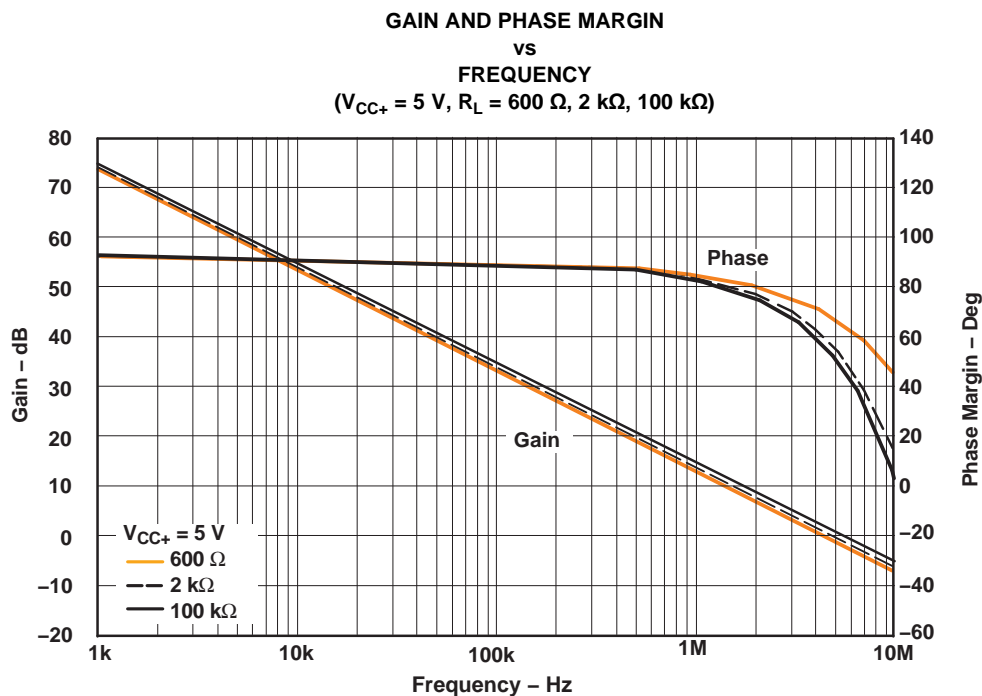


Figure 17.

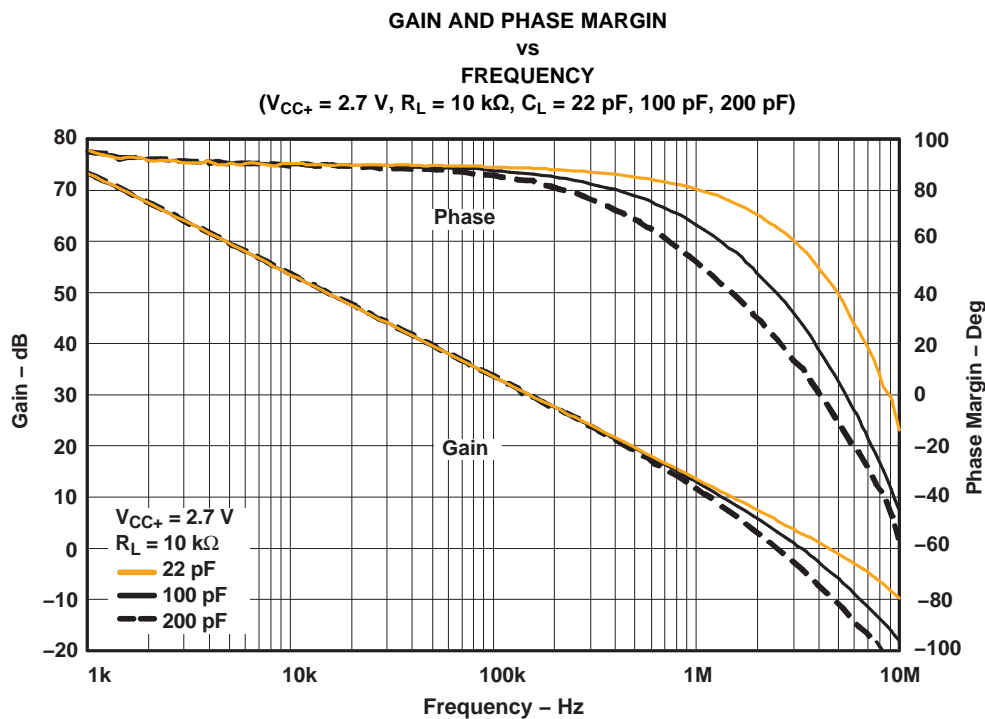
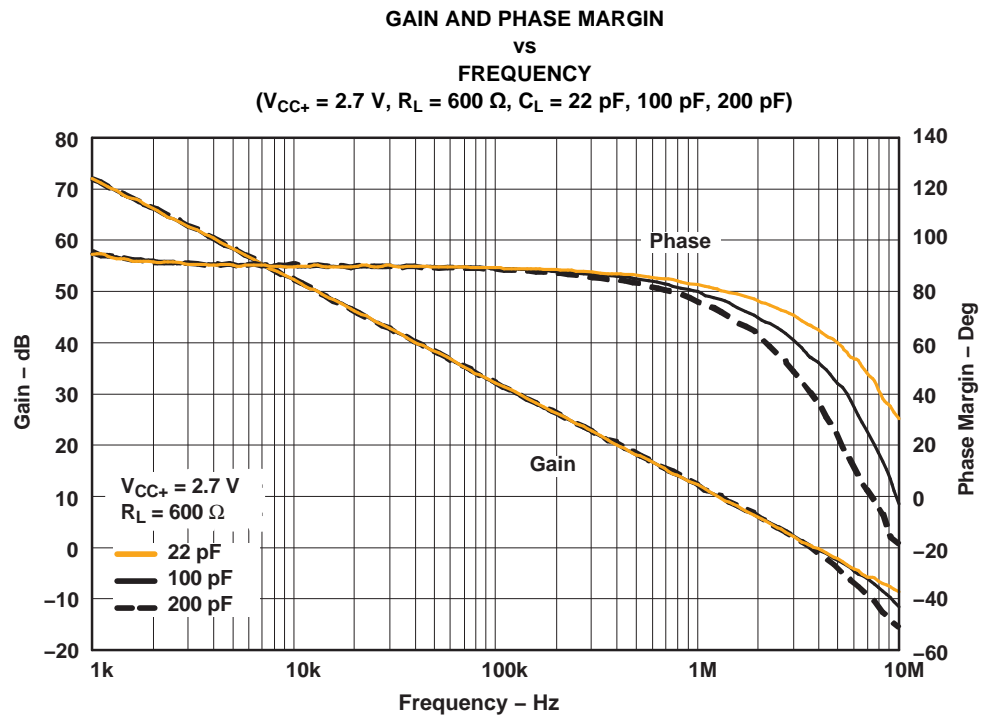


Figure 18.

TYPICAL CHARACTERISTICS (continued)

T_A = 25°C, V_{CC+} = 5-V Single Supply (Unless Otherwise Noted)



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TYPICAL CHARACTERISTICS (continued)

$T_A = 25^\circ\text{C}$, $V_{CC+} = 5\text{-V}$ Single Supply (Unless Otherwise Noted)



Figure 21.

PACKAGING INFORMATION

| Orderable Device | Status (1) | Package Type | Package Drawing | Pins | Package Qty | Eco Plan (2) | Lead/Ball Finish (6) | MSL Peak Temp (3) | Op Temp (°C) | Device Marking (4/5) | Samples |
|------------------|---------------|--------------|-----------------|------|-------------|-----------------|-------------------------|----------------------|--------------|-------------------------|---------|
| LMV821DBVR | OBSOLETE | SOT-23 | DBV | 5 | | TBD | Call TI | Call TI | -40 to 85 | (RB8B ~ RB8C ~ RB8I) | |
| LMV821DBVRE4 | OBSOLETE | SOT-23 | DBV | 5 | | TBD | Call TI | Call TI | -40 to 85 | | |
| LMV821DBVRG4 | OBSOLETE | SOT-23 | DBV | 5 | | TBD | Call TI | Call TI | -40 to 85 | | |
| LMV821DBVT | OBSOLETE | SOT-23 | DBV | 5 | | TBD | Call TI | Call TI | -40 to 85 | (RB8B ~ RB8C ~ RB8I) | |
| LMV821DBVTE4 | OBSOLETE | SOT-23 | DBV | 5 | | TBD | Call TI | Call TI | -40 to 85 | | |
| LMV821DBVTG4 | OBSOLETE | SOT-23 | DBV | 5 | | TBD | Call TI | Call TI | -40 to 85 | | |
| LMV821DCKR | OBSOLETE | SC70 | DCK | 5 | | TBD | Call TI | Call TI | -40 to 85 | (RYB ~ RYC ~ RYI) | |
| LMV821DCKRE4 | OBSOLETE | SC70 | DCK | 5 | | TBD | Call TI | Call TI | -40 to 85 | | |
| LMV821DCKRG4 | OBSOLETE | SC70 | DCK | 5 | | TBD | Call TI | Call TI | -40 to 85 | | |
| LMV821DCKT | OBSOLETE | SC70 | DCK | 5 | | TBD | Call TI | Call TI | -40 to 85 | (RYB ~ RYI) | |
| LMV821DCKTE4 | OBSOLETE | SC70 | DCK | 5 | | TBD | Call TI | Call TI | -40 to 85 | | |
| LMV821DCKTG4 | OBSOLETE | SC70 | DCK | 5 | | TBD | Call TI | Call TI | -40 to 85 | | |
| LMV821IDBVR | OBSOLETE | SOT-23 | DBV | 5 | | TBD | Call TI | Call TI | -40 to 125 | RB1B | |
| LMV821IDBVRE4 | OBSOLETE | SOT-23 | DBV | 5 | | TBD | Call TI | Call TI | -40 to 125 | | |
| LMV821IDBVRG4 | OBSOLETE | SOT-23 | DBV | 5 | | TBD | Call TI | Call TI | -40 to 125 | | |
| LMV821IDBVT | OBSOLETE | SOT-23 | DBV | 5 | | TBD | Call TI | Call TI | -40 to 125 | RB1B | |
| LMV821IDBVTE4 | OBSOLETE | SOT-23 | DBV | 5 | | TBD | Call TI | Call TI | -40 to 125 | | |
| LMV821IDBVTG4 | OBSOLETE | SOT-23 | DBV | 5 | | TBD | Call TI | Call TI | -40 to 125 | | |
| LMV821IDCKR | OBSOLETE | SC70 | DCK | 5 | | TBD | Call TI | Call TI | -40 to 125 | (RZB ~ RZI) | |
| LMV821IDCKRE4 | OBSOLETE | SC70 | DCK | 5 | | TBD | Call TI | Call TI | -40 to 125 | | |
| LMV821IDCKRG4 | OBSOLETE | SC70 | DCK | 5 | | TBD | Call TI | Call TI | -40 to 125 | | |
| LMV821IDCKT | OBSOLETE | SC70 | DCK | 5 | | TBD | Call TI | Call TI | -40 to 125 | (RZB ~ RZI) | |
| LMV821IDCKTE4 | OBSOLETE | SC70 | DCK | 5 | | TBD | Call TI | Call TI | -40 to 125 | | |
| LMV821IDCKTG4 | OBSOLETE | SC70 | DCK | 5 | | TBD | Call TI | Call TI | -40 to 125 | | |
| LMV822D | OBSOLETE | SOIC | D | 8 | | TBD | Call TI | Call TI | -40 to 85 | MV822 | |
| LMV822DE4 | OBSOLETE | SOIC | D | 8 | | TBD | Call TI | Call TI | -40 to 85 | | |
| LMV822DG4 | OBSOLETE | SOIC | D | 8 | | TBD | Call TI | Call TI | -40 to 85 | | |
| LMV822DGKR | OBSOLETE | VSSOP | DGK | 8 | | TBD | Call TI | Call TI | -40 to 85 | (RAB ~ RAC) | |

| Orderable Device | Status (1) | Package Type | Package Drawing | Pins | Package Qty | Eco Plan (2) | Lead/Ball Finish (6) | MSL Peak Temp (3) | Op Temp (°C) | Device Marking (4/5) | Samples |
|------------------|---------------|--------------|-----------------|------|-------------|-----------------|-------------------------|----------------------|--------------|-------------------------|---------|
| LMV822DGKRG4 | OBSOLETE | VSSOP | DGK | 8 | | TBD | Call TI | Call TI | -40 to 85 | | |
| LMV822DR | OBSOLETE | SOIC | D | 8 | | TBD | Call TI | Call TI | -40 to 85 | MV822 | |
| LMV822DRE4 | OBSOLETE | SOIC | D | 8 | | TBD | Call TI | Call TI | -40 to 85 | | |
| LMV822DRG4 | OBSOLETE | SOIC | D | 8 | | TBD | Call TI | Call TI | -40 to 85 | | |
| LMV822ID | OBSOLETE | SOIC | D | 8 | | TBD | Call TI | Call TI | -40 to 125 | MV822I | |
| LMV822IDE4 | OBSOLETE | SOIC | D | 8 | | TBD | Call TI | Call TI | -40 to 125 | | |
| LMV822IDG4 | OBSOLETE | SOIC | D | 8 | | TBD | Call TI | Call TI | -40 to 125 | | |
| LMV822IDGKR | OBSOLETE | VSSOP | DGK | 8 | | TBD | Call TI | Call TI | -40 to 125 | (R8B ~ R8C) | |
| LMV822IDGKRG4 | OBSOLETE | VSSOP | DGK | 8 | | TBD | Call TI | Call TI | -40 to 125 | | |
| LMV822IDR | OBSOLETE | SOIC | D | 8 | | TBD | Call TI | Call TI | -40 to 125 | MV822I | |
| LMV822IDRE4 | OBSOLETE | SOIC | D | 8 | | TBD | Call TI | Call TI | -40 to 125 | | |
| LMV822IDRG4 | OBSOLETE | SOIC | D | 8 | | TBD | Call TI | Call TI | -40 to 125 | | |
| LMV824D | OBSOLETE | SOIC | D | 14 | | TBD | Call TI | Call TI | -40 to 85 | LMV824 | |
| LMV824DE4 | OBSOLETE | SOIC | D | 14 | | TBD | Call TI | Call TI | -40 to 85 | | |
| LMV824DG4 | OBSOLETE | SOIC | D | 14 | | TBD | Call TI | Call TI | -40 to 85 | | |
| LMV824DGVR | OBSOLETE | TVSOP | DGV | 14 | | TBD | Call TI | Call TI | -40 to 85 | MV824 | |
| LMV824DGVRE4 | OBSOLETE | TVSOP | DGV | 14 | | TBD | Call TI | Call TI | -40 to 85 | | |
| LMV824DGVRG4 | OBSOLETE | TVSOP | DGV | 14 | | TBD | Call TI | Call TI | -40 to 85 | | |
| LMV824DR | OBSOLETE | SOIC | D | 14 | | TBD | Call TI | Call TI | -40 to 85 | LMV824 | |
| LMV824DRE4 | OBSOLETE | SOIC | D | 14 | | TBD | Call TI | Call TI | -40 to 85 | | |
| LMV824DRG4 | OBSOLETE | SOIC | D | 14 | | TBD | Call TI | Call TI | -40 to 85 | | |
| LMV824ID | OBSOLETE | SOIC | D | 14 | | TBD | Call TI | Call TI | -40 to 125 | LMV824I | |
| LMV824IDE4 | OBSOLETE | SOIC | D | 14 | | TBD | Call TI | Call TI | -40 to 125 | | |
| LMV824IDG4 | OBSOLETE | SOIC | D | 14 | | TBD | Call TI | Call TI | -40 to 125 | | |
| LMV824IDGVR | OBSOLETE | TVSOP | DGV | 14 | | TBD | Call TI | Call TI | -40 to 125 | MV824I | |
| LMV824IDGVRE4 | OBSOLETE | TVSOP | DGV | 14 | | TBD | Call TI | Call TI | -40 to 125 | | |
| LMV824IDGVRG4 | OBSOLETE | TVSOP | DGV | 14 | | TBD | Call TI | Call TI | -40 to 125 | | |
| LMV824IDR | OBSOLETE | SOIC | D | 14 | | TBD | Call TI | Call TI | -40 to 125 | LMV824I | |
| LMV824IDRE4 | OBSOLETE | SOIC | D | 14 | | TBD | Call TI | Call TI | -40 to 125 | | |
| LMV824IDRG4 | OBSOLETE | SOIC | D | 14 | | TBD | Call TI | Call TI | -40 to 125 | | |
| LMV824IPW | OBSOLETE | TSSOP | PW | 14 | | TBD | Call TI | Call TI | -40 to 125 | MV824I | |

| Orderable Device | Status (1) | Package Type | Package Drawing | Pins | Package Qty | Eco Plan (2) | Lead/Ball Finish (6) | MSL Peak Temp (3) | Op Temp (°C) | Device Marking (4/5) | Samples |
|------------------|---------------|--------------|-----------------|------|-------------|-----------------|-------------------------|----------------------|--------------|-------------------------|---------|
| LMV824IPWE4 | OBSOLETE | TSSOP | PW | 14 | | TBD | Call TI | Call TI | -40 to 125 | | |
| LMV824IPWG4 | OBSOLETE | TSSOP | PW | 14 | | TBD | Call TI | Call TI | -40 to 125 | | |
| LMV824IPWR | OBSOLETE | TSSOP | PW | 14 | | TBD | Call TI | Call TI | -40 to 125 | MV824I | |
| LMV824IPWRE4 | NRND | TSSOP | PW | 14 | | TBD | Call TI | Call TI | -40 to 125 | | |
| LMV824IPWRG4 | OBSOLETE | TSSOP | PW | 14 | | TBD | Call TI | Call TI | -40 to 125 | | |
| LMV824PW | OBSOLETE | TSSOP | PW | 14 | | TBD | Call TI | Call TI | -40 to 85 | MV824 | |
| LMV824PWE4 | OBSOLETE | TSSOP | PW | 14 | | TBD | Call TI | Call TI | -40 to 85 | | |
| LMV824PWG4 | OBSOLETE | TSSOP | PW | 14 | | TBD | Call TI | Call TI | -40 to 85 | | |
| LMV824PWR | OBSOLETE | TSSOP | PW | 14 | | TBD | Call TI | Call TI | -40 to 85 | MV824 | |
| LMV824PWRE4 | OBSOLETE | TSSOP | PW | 14 | | TBD | Call TI | Call TI | -40 to 85 | | |
| LMV824PWRG4 | OBSOLETE | TSSOP | PW | 14 | | TBD | Call TI | Call TI | -40 to 85 | | |

(1) The marketing status values are defined as follows:

ACTIVE: Product device recommended for new designs.

LIFEBUY: TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.

NRND: Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.

PREVIEW: Device has been announced but is not in production. Samples may or may not be available.

OBSOLETE: TI has discontinued the production of the device.

(2) Eco Plan - The planned eco-friendly classification: Pb-Free (RoHS), Pb-Free (RoHS Exempt), or Green (RoHS & no Sb/Br) - please check <http://www.ti.com/productcontent> for the latest availability information and additional product content details.

TBD: The Pb-Free/Green conversion plan has not been defined.

Pb-Free (RoHS): TI's terms "Lead-Free" or "Pb-Free" mean semiconductor products that are compatible with the current RoHS requirements for all 6 substances, including the requirement that lead not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, TI Pb-Free products are suitable for use in specified lead-free processes.

Pb-Free (RoHS Exempt): This component has a RoHS exemption for either 1) lead-based flip-chip solder bumps used between the die and package, or 2) lead-based die adhesive used between the die and leadframe. The component is otherwise considered Pb-Free (RoHS compatible) as defined above.

Green (RoHS & no Sb/Br): TI defines "Green" to mean Pb-Free (RoHS compatible), and free of Bromine (Br) and Antimony (Sb) based flame retardants (Br or Sb do not exceed 0.1% by weight in homogeneous material)

(3) MSL, Peak Temp. - The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

(4) There may be additional marking, which relates to the logo, the lot trace code information, or the environmental category on the device.

(5) Multiple Device Markings will be inside parentheses. Only one Device Marking contained in parentheses and separated by a "~" will appear on a device. If a line is indented then it is a continuation of the previous line and the two combined represent the entire Device Marking for that device.

⁽⁶⁾ Lead/Ball Finish - Orderable Devices may have multiple material finish options. Finish options are separated by a vertical ruled line. Lead/Ball Finish values may wrap to two lines if the finish value exceeds the maximum column width.

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OTHER QUALIFIED VERSIONS OF LMV821 :

- Automotive: [LMV821-Q1](#)

NOTE: Qualified Version Definitions:

- Automotive - Q100 devices qualified for high-reliability automotive applications targeting zero defects

DGV (R-PDSO-G**)

PLASTIC SMALL-OUTLINE

24 PINS SHOWN



4073251/E 08/00

- NOTES: A. All linear dimensions are in millimeters.
 B. This drawing is subject to change without notice.
 C. Body dimensions do not include mold flash or protrusion, not to exceed 0,15 per side.
 D. Falls within JEDEC: 24/48 Pins – MO-153
 14/16/20/56 Pins – MO-194

PW (R-PDSO-G14)

PLASTIC SMALL OUTLINE

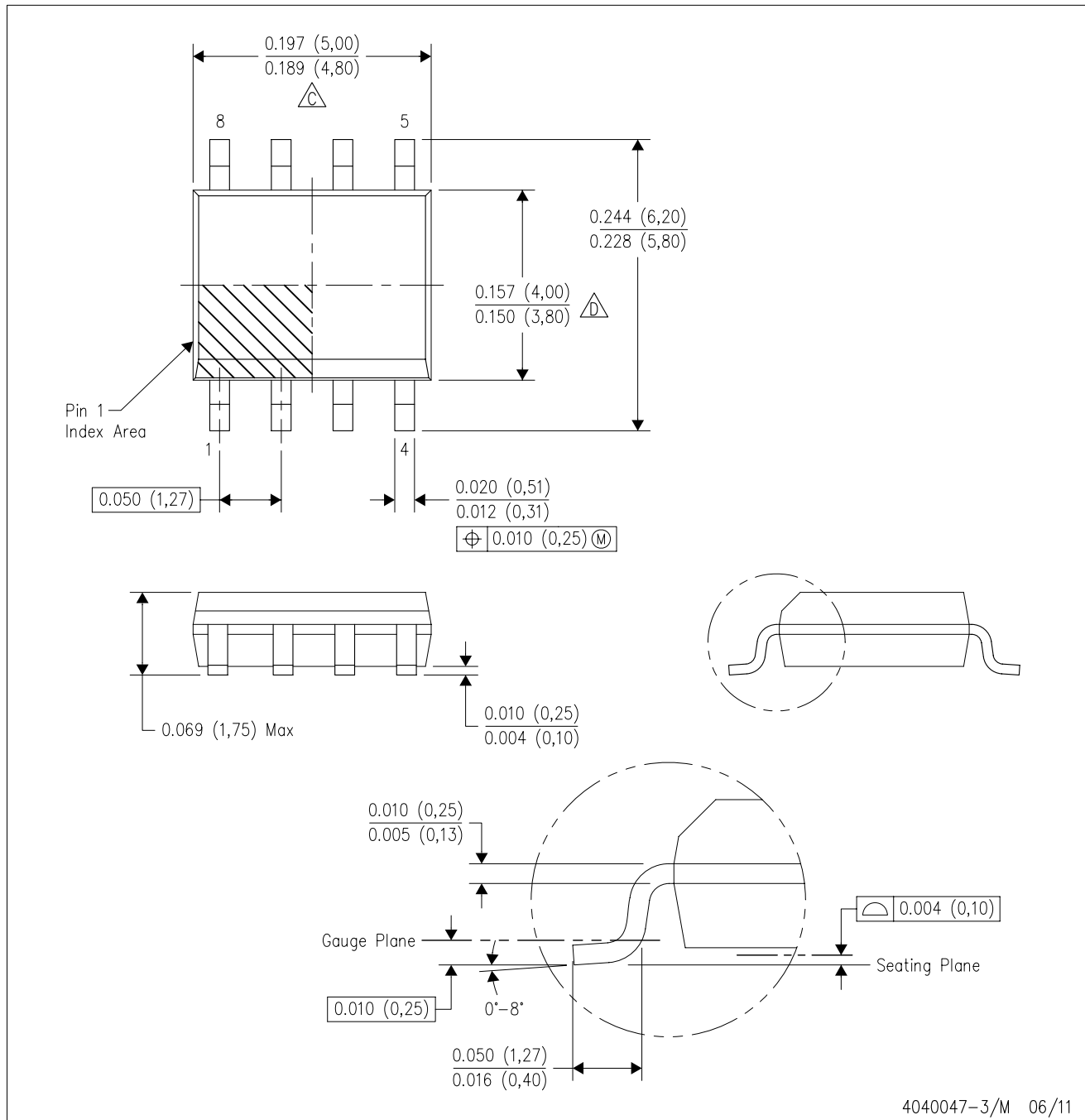


4040064-3/G 02/11

- NOTES:
- A. All linear dimensions are in millimeters. Dimensioning and tolerancing per ASME Y14.5M-1994.
 - B. This drawing is subject to change without notice.
 - C. Body length does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0,15 each side.
 - D. Body width does not include interlead flash. Interlead flash shall not exceed 0,25 each side.
 - E. Falls within JEDEC MO-153

D (R-PDSO-G8)

PLASTIC SMALL OUTLINE



- NOTES:
- A. All linear dimensions are in inches (millimeters).
 - B. This drawing is subject to change without notice.
 - Body length does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0.006 (0,15) each side.
 - Body width does not include interlead flash. Interlead flash shall not exceed 0.017 (0,43) each side.
 - E. Reference JEDEC MS-012 variation AA.

DBV (R-PDSO-G5)

PLASTIC SMALL-OUTLINE PACKAGE



- NOTES:
- A. All linear dimensions are in millimeters.
 - B. This drawing is subject to change without notice.
 - C. Body dimensions do not include mold flash or protrusion. Mold flash and protrusion shall not exceed 0.15 per side.
 - D. Falls within JEDEC MO-178 Variation AA.

DCK (R-PDSO-G5)

PLASTIC SMALL-OUTLINE PACKAGE



- NOTES:
- A. All linear dimensions are in millimeters.
 - B. This drawing is subject to change without notice.
 - C. Body dimensions do not include mold flash or protrusion. Mold flash and protrusion shall not exceed 0.15 per side.
 - D. Falls within JEDEC MO-203 variation AA.

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