

LMS1585A 5A/LMS1587 5A and 3A Low Dropout Fast Response Regulators

 Check for Samples: [LMS1585A](#) , [LMS1587](#)

FEATURES

- Fast Transient Response
- Available in Adjustable, 1.5V, and 3.3V versions
- Current Limiting and Thermal Protection
- Commercial Temp. Range: 0°C to 125°C
- Industrial Temp. Range: -40°C to 125°C
- Line Regulation 0.005% (typical)
- Load Regulation 0.05% (typical)
- Direct Replacement for LT[®] 1585A/87

APPLICATIONS

- Pentium[®] processor supplies
- PowerPC[®] supplies
- Other microprocessor supplies
- Low voltage logic supplies

DESCRIPTION

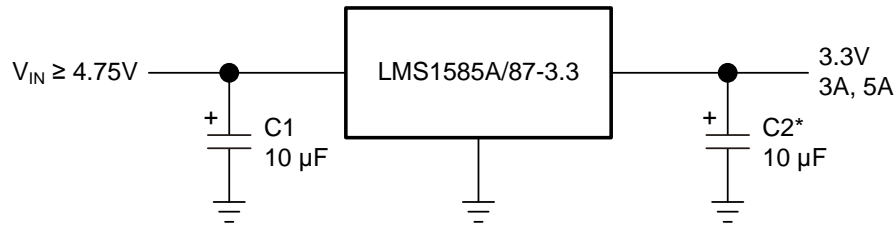
The LMS1585A and LMS1587 are low dropout positive regulators with output load current of 5A and 3A respectively. Their low dropout voltage (1.2V) and fast transient response make them an excellent solution for low voltage microprocessor applications.

The LMS1585A/87 are available in adjustable versions, which can set the output voltage with only two external resistors. In addition, they are also available in 1.5V and 3.3V fixed voltage versions⁽¹⁾.

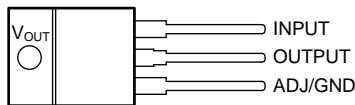
The LMS1585A/87 circuits include a zener trimmed bandgap reference, current limiting and thermal shutdown. The LMS1585A/87 series are available in KTT (TO-263) and NDE (TO-220) packages.

(1) Consult factory for other fixed voltage options.

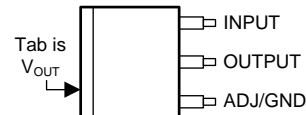
Typical Application



* Required for Stability



**Figure 1. NDE (TO-220)
(Top View)**



**Figure 2. KTT (TO-263)
(Top View)**



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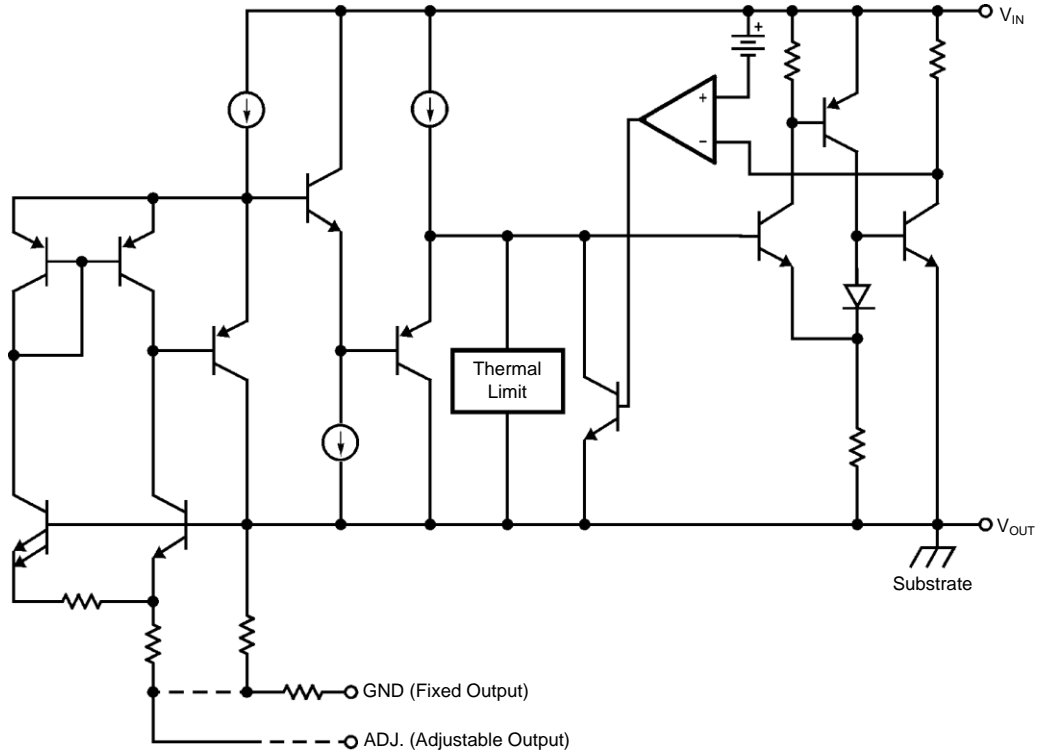


Table 1. LMS1585A/LMS1587 Device Options

| Part Number | Output Voltage | Operating Temperature | Package Drawing | Package Type | Output Current |
|----------------|----------------|-----------------------|-----------------|--------------|----------------|
| LMS1585AIS-1.5 | 1.5V | -40°C to 125°C | KTT | TO-263 | 5A |
| LMS1585AIS-3.3 | 3.3V | | | | |
| LMS1585ACS-ADJ | Adjustable | 0°C to 125°C | NDE | TO-220 | 5A |
| LMS1585ACS-1.5 | 1.5V | | | | |
| LMS1585ACS-3.3 | 3.3V | | | | |
| LMS1585ACT-1.5 | 1.5V | | | | |
| LMS1585ACT-3.3 | 3.3V | -40°C to 125°C | KTT | TO-263 | 3A |
| LMS1587IS-ADJ | Adjustable | | | | |
| LMS1587IS-1.5 | 1.5V | | | | |
| LMS1587IS-3.3 | 3.3V | 0°C to 125°C | KTT | TO-263 | 3A |
| LMS1587CS-ADJ | Adjustable | | | | |
| LMS1587CS-3.3 | 3.3V | -40°C to 125°C | NDE | TO-220 | 3A |
| LMS1587CS-1.5 | 1.5V | | | | |
| LMS1587IT-1.5 | 1.5V | | | | |
| LMS1587CT-ADJ | Adjustable | | | | |
| LMS1587CT-3.3 | 3.3V | | | | |



These devices have limited built-in ESD protection. The leads should be shorted together or the device placed in conductive foam during storage or handling to prevent electrostatic damage to the MOS gates.

ABSOLUTE MAXIMUM RATINGS⁽¹⁾⁽²⁾

| | |
|--|--------------------|
| Maximum Input to Output Voltage (V_{IN} to GND) | 13V |
| Power Dissipation ⁽³⁾ | Internally Limited |
| Junction Temperature (T_J) ⁽³⁾ | 150°C |
| Storage Temperature Range | -65°C to 150°C |
| Lead Temperature | 260°C, 10 sec |
| ESD Tolerance ⁽⁴⁾ | 2000V |

- (1) Absolute Maximum Ratings indicate limits beyond which damage to the device may occur. Operating Ratings indicate conditions for which the device is intended to be functional, but specific performance is not ensured. For ensured specifications and the test conditions, see the Electrical Characteristics.
- (2) If Military/Aerospace specified devices are required, please contact the TI Sales Office/ Distributors for availability and specifications.
- (3) The maximum power dissipation is a function of $T_{J(max)}$, θ_{JA} , and T_A . The maximum allowable power dissipation at any ambient temperature is $P_D = (T_{J(max)} - T_A) / \theta_{JA}$. All numbers apply for packages soldered directly into a PC board.
- (4) For testing purposes, ESD was applied using human body model, 1.5 k Ω in series with 100 pF.

ELECTRICAL CHARACTERISTICS

Typicals and limits appearing in normal type apply for $T_j = 25^\circ\text{C}$. Limits appearing in **Boldface** type apply over the entire junction temperature range for operation, 0°C to 125°C for commercial grade and -40°C to 125°C for industrial grade.

| Symbol | Parameter | Conditions | Min ⁽¹⁾ | Typ ⁽²⁾ | Max ⁽¹⁾ | Units |
|----------------------------------|--------------------------------|---|-----------------------|-----------------------|-----------------------|--------|
| V_{REF} | Reference Voltage | LMS1585A-ADJ $V_{\text{IN}} - V_{\text{OUT}} = 3\text{V}$, $I_{\text{OUT}} = 10\text{mA}$ $10\text{mA} \leq I_{\text{OUT}} \leq 5\text{A}$, $1.5\text{V} \leq V_{\text{IN}} - V_{\text{OUT}} \leq 5.75\text{V}$ | 1.238 1.225 | 1.250 1.250 | 1.262 1.275 | V V |
| | | LMS1587-ADJ $10\text{mA} \leq I_{\text{OUT}} \leq 3\text{A}$, $1.5\text{V} \leq V_{\text{IN}} - V_{\text{OUT}} \leq 5.75\text{V}$ | 1.225 | 1.250 | 1.275 | V |
| V_{OUT} | Output Voltage | LMS1585A-1.5 $I_{\text{OUT}} = 0\text{mA}$, $V_{\text{IN}} = 5\text{V}$ $0 \leq I_{\text{OUT}} \leq 5\text{A}$, $3\text{V} \leq V_{\text{IN}} \leq 7\text{V}$ | 1.485 1.470 | 1.500 | 1.515 1.530 | V V |
| | | LMS1585A-3.3 $I_{\text{OUT}} = 0\text{mA}$, $V_{\text{IN}} = 5\text{V}$ $0 \leq I_{\text{OUT}} \leq 5\text{A}$, $4.75\text{V} \leq V_{\text{IN}} \leq 7\text{V}$ | 3.267 3.235 | 3.300 3.300 | 3.333 3.365 | V V |
| | | LMS1587-1.5 $V_{\text{IN}} = 5\text{V}$, $I_{\text{OUT}} = 0\text{mA}$, $T_j = 25^\circ\text{C}$ $0 \leq I_{\text{OUT}} \leq 3\text{A}$, $3\text{V} \leq V_{\text{IN}} \leq 7\text{V}$ | 1.485 1.470 | 1.500 1.500 | 1.515 1.530 | V V |
| | | LMS1587-3.3 $0 \leq I_{\text{OUT}} \leq 3\text{A}$, $4.75\text{V} \leq V_{\text{IN}} \leq 7\text{V}$ | 3.235 | 3.300 | 3.365 | V |
| ΔV_{OUT} | Line Regulation ⁽³⁾ | LMS1585A/87-ADJ $I_{\text{OUT}} = 10\text{mA}$, $2.75\text{V} \leq V_{\text{IN}} \leq 7\text{V}$ | | 0.005 | 0.2 | % |
| | | LMS1585A/87-3.3 $I_{\text{OUT}} = 0\text{mA}$, $4.75\text{V} \leq V_{\text{IN}} \leq 7\text{V}$ | | 0.005 | 0.2 | % |
| | | LMS1585A/87-1.5 $I_{\text{OUT}} = 0\text{mA}$, $3\text{V} \leq V_{\text{IN}} \leq 7\text{V}$ | | 0.005 | 0.2 | % |
| ΔV_{OUT} | Load Regulation ⁽³⁾ | LMS1585A-ADJ $V_{\text{IN}} - V_{\text{OUT}} = 3\text{V}$, $10\text{mA} \leq I_{\text{OUT}} \leq 5\text{A}$ | | 0.05 | 0.3 0.5 | % |
| | | LMS1585A-1.5/LMS1585A-3.3 $V_{\text{IN}} = 5\text{V}$, $0 \leq I_{\text{OUT}} \leq 5\text{A}$ | | 0.05 0.05 | 0.3 0.5 | % |
| | | LMS1587-ADJ $V_{\text{IN}} - V_{\text{OUT}} = 3\text{V}$, $10\text{mA} \leq I_{\text{OUT}} \leq 3\text{A}$ | | 0.05 0.05 | 0.3 0.5 | % |
| | | LMS1587-1.5/LMS1587-3.3 $V_{\text{IN}} = 5\text{V}$, $0 \leq I_{\text{OUT}} \leq 3\text{A}$ | | 0.05 0.05 | 0.3 0.5 | % |
| $V_{\text{IN}} - V_{\text{OUT}}$ | Dropout Voltage | LMS1585A-ADJ/LMS1587-ADJ $\Delta V_{\text{REF}} = 1\%$, $I_{\text{OUT}} = 3\text{A}$ | | 1.15 | 1.3 | V |
| | | LMS1585A-3.3/LMS1587-3.3/ LMS1585A-1.5/LMS1587-1.5 $\Delta V_{\text{OUT}} = 1\%$, $I_{\text{OUT}} = 3\text{A}$ | | 1.15 | 1.3 | V |
| | | LMS1585A-ADJ $\Delta V_{\text{REF}} = 1\%$, $I_{\text{OUT}} = 5\text{A}$ | | 1.2 | 1.4 | V |
| | | LMS1585A-1.5/LMS1585A-3.3 $\Delta V_{\text{OUT}} = 1\%$, $I_{\text{OUT}} = 5\text{A}$ | | 1.2 | 1.4 | V |

(1) All limits are specified by testing or statistical analysis.

(2) Typical Values represent the most likely parametric norm.

(3) Load and line regulation are measured at constant junction temperature, and are ensured up to the maximum power dissipation of 30W. Power dissipation is determined by the input/output differential and the output current. Ensured maximum power dissipation will not be available over the full input/output range.

ELECTRICAL CHARACTERISTICS (continued)

Typicals and limits appearing in normal type apply for $T_j = 25^\circ\text{C}$. Limits appearing in **Boldface** type apply over the entire junction temperature range for operation, 0°C to 125°C for commercial grade and -40°C to 125°C for industrial grade.

| | | | | | | |
|-------------|--|--|------------|-------|----------------------|---------------|
| I_{LIMIT} | Current Limit | LMS1585A-ADJ/LMS1585A-3.3/LMS1585A-1.5 $V_{IN}-V_{OUT} = 5.5\text{V}$ | 5.0 | 6.6 | | A |
| | | LMS1587-ADJ/LMS1587-3.3/LMS1587-1.5 $V_{IN}-V_{OUT} = 5.5\text{V}$ | 3.1 | 4.3 | | A |
| | Minimum Load Current ⁽⁴⁾ | LMS1585A/87-ADJ $1.5\text{V} \leq V_{IN}-V_{OUT} \leq 5.75\text{V}$ | | 2.0 | 10.0 | mA |
| | Quiescent Current | LMS1585A-3.3/LMS1587-3.3/ LMS1585A-1.5/LMS1587-1.5 $V_{IN} = 5\text{V}$ | | 7.0 | 13.0 | mA |
| | Thermal Regulation | $T_A = 25^\circ\text{C}$, 30ms Pulse | | 0.003 | | %/W |
| | Ripple Rejection | LMS1585A-ADJ $f_{RIPPLE} = 120\text{Hz}$, $V_{IN}-V_{OUT} = 3\text{V}$, $I_{OUT} = 5\text{A}$, $C_{OUT} = 25\mu\text{F}$ Tantalum | | 72 | | dB |
| | | LMS1585A-1.5 $f_{RIPPLE} = 120\text{Hz}$, $C_{OUT} = 25\mu\text{F}$ Tantalum, $I_{OUT} = 5\text{A}$, $V_{IN} = 4.5\text{V}$ | 60 | 72 | | dB |
| | | LMS1585A-3.3 $f_{RIPPLE} = 120\text{Hz}$, $C_{OUT} = 25\mu\text{F}$ Tantalum, $I_{OUT} = 5\text{A}$, $V_{IN} = 6.3\text{V}$ | | 72 | | dB |
| | | LMS1587-ADJ $f_{RIPPLE} = 120\text{ Hz}$, $V_{IN}-V_{OUT} = 3\text{V}$, $I_{OUT} = 3\text{A}$ $C_{OUT} = 25\mu\text{F}$ Tantalum | | 72 | | dB |
| | | LMS1587-1.5 $f_{RIPPLE} = 120\text{ Hz}$, $C_{OUT} = 25\mu\text{F}$ Tantalum, $I_{OUT} = 3\text{A}$, $V_{IN} = 4.5\text{V}$ | 60 | 72 | | dB |
| | | LMS1587-3.3 $f_{RIPPLE} = 120\text{ Hz}$, $C_{OUT} = 25\mu\text{F}$ Tantalum, $I_{OUT} = 3\text{A}$, $V_{IN} = 6.3\text{V}$ | | 72 | | dB |
| | Adjust Pin Current | | | 55 | 120 | μA |
| | Adjust Pin Current | $10\text{mA} \leq I_{OUT} \leq I_{FULLLOAD}$, $1.5\text{V} \leq V_{IN}-V_{OUT} \leq 5.75\text{V}$ ⁽⁵⁾ | | 0.2 | | μA |
| | Temperature Stability | | | 0.5 | | % |
| | Long Term Stability | $T_A = 125^\circ\text{C}$, 1000Hrs | | 0.03 | | % |
| | RMS Output Noise (% of V_{OUT}) | $10\text{Hz} \leq f \leq 10\text{kHz}$ | | 0.003 | | % |
| | Thermal Resistance Junction-to-Case | 3-Lead KTT (TO-263): Control/Output Section 3-Lead NDE (TO-220): Control/Output Section | | | 0.65/2.7 0.65/2.7 | *C/W *C/W |

(4) The minimum output current required to maintain regulation.

(5) $I_{FULLLOAD}$ is 5A for LMS1585A and 3A for LMS1587.

APPLICATION NOTE

OUTPUT VOLTAGE

The adjustable version develops at 1.25V reference voltage, (V_{REF}), between the output and the adjust terminal. As shown in [Figure 3](#), this voltage is applied across resistor R1 to generate a constant current I1. This constant current then flows through R2. The resulting voltage drop across R2 adds to the reference voltage to sets the desired output voltage.

The current I_{ADJ} from the adjustment terminal introduces an output error. But since it is small (120 μ A max), it becomes negligible when R1 is in the 100 Ω range.

For fixed voltage devices, R1 and R2 are integrated inside the devices.

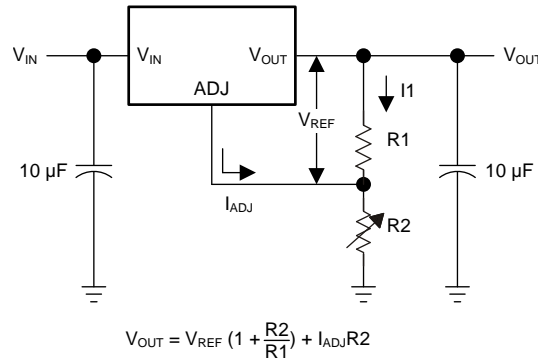


Figure 3. Basic Adjustable Regulator

PACKAGING INFORMATION

| Orderable Device | Status (1) | Package Type | Package Drawing | Pins | Package Qty | Eco Plan (2) | Lead finish/ Ball material (6) | MSL Peak Temp (3) | Op Temp (°C) | Device Marking (4/5) | Samples |
|----------------------|---------------|------------------|-----------------|------|-------------|------------------------|--------------------------------------|----------------------|--------------|-------------------------|-------------------------|
| LMS1585ACS-1.5 | NRND | DDPAK/ TO-263 | KTT | 3 | 45 | Non-RoHS & Green | Call TI | Level-3-235C-168 HR | 0 to 125 | LMS1585 ACS-1.5 | |
| LMS1585ACS-1.5/NOPB | ACTIVE | DDPAK/ TO-263 | KTT | 3 | 45 | RoHS-Exempt & Green | SN | Level-3-245C-168 HR | 0 to 125 | LMS1585 ACS-1.5 | Samples |
| LMS1585ACS-3.3 | NRND | DDPAK/ TO-263 | KTT | 3 | 45 | Non-RoHS & Green | Call TI | Level-3-235C-168 HR | 0 to 125 | LMS1585 ACS-3.3 | |
| LMS1585ACS-3.3/NOPB | ACTIVE | DDPAK/ TO-263 | KTT | 3 | 45 | RoHS-Exempt & Green | SN | Level-3-245C-168 HR | 0 to 125 | LMS1585 ACS-3.3 | Samples |
| LMS1585ACSX-1.5/NOPB | ACTIVE | DDPAK/ TO-263 | KTT | 3 | 500 | RoHS-Exempt & Green | SN | Level-3-245C-168 HR | 0 to 125 | LMS1585 ACS-1.5 | Samples |
| LMS1585ACSX-3.3/NOPB | ACTIVE | DDPAK/ TO-263 | KTT | 3 | 500 | RoHS-Exempt & Green | SN | Level-3-245C-168 HR | 0 to 125 | LMS1585 ACS-3.3 | Samples |
| LMS1585ACSX-ADJ/NOPB | ACTIVE | DDPAK/ TO-263 | KTT | 3 | 500 | RoHS-Exempt & Green | SN | Level-3-245C-168 HR | 0 to 125 | LMS1585 ACS-ADJ | Samples |
| LMS1585ACT-1.5/NOPB | ACTIVE | TO-220 | NDE | 3 | 45 | RoHS & Green | SN | Level-1-NA-UNLIM | 0 to 125 | LMS1585ACT 1.5 | Samples |
| LMS1585ACT-3.3/NOPB | ACTIVE | TO-220 | NDE | 3 | 45 | RoHS & Green | SN | Level-1-NA-UNLIM | 0 to 125 | LMS1585 ACT-3.3 | Samples |
| LMS1585AIS-1.5 | NRND | DDPAK/ TO-263 | KTT | 3 | 45 | Non-RoHS & Green | Call TI | Level-3-235C-168 HR | -40 to 125 | LMS1585 AIS-1.5 | |
| LMS1585AIS-1.5/NOPB | ACTIVE | DDPAK/ TO-263 | KTT | 3 | 45 | RoHS-Exempt & Green | SN | Level-3-245C-168 HR | -40 to 125 | LMS1585 AIS-1.5 | Samples |
| LMS1585AIS-3.3/NOPB | ACTIVE | DDPAK/ TO-263 | KTT | 3 | 45 | RoHS-Exempt & Green | SN | Level-3-245C-168 HR | -40 to 125 | LMS1585 AIS-3.3 | Samples |
| LMS1585AISX-3.3/NO | ACTIVE | DDPAK/ TO-263 | KTT | 3 | 500 | RoHS-Exempt & Green | SN | Level-3-245C-168 HR | -40 to 125 | LMS1585 AIS-3.3 | Samples |
| LMS1587CS-1.5/NOPB | ACTIVE | DDPAK/ TO-263 | KTT | 3 | 45 | RoHS-Exempt & Green | SN | Level-3-245C-168 HR | 0 to 125 | LMS1587 CS-1.5 | Samples |
| LMS1587CS-3.3/NOPB | ACTIVE | DDPAK/ TO-263 | KTT | 3 | 45 | RoHS-Exempt & Green | SN | Level-3-245C-168 HR | 0 to 125 | LMS1587 CS-3.3 | Samples |
| LMS1587CS-ADJ | NRND | DDPAK/ TO-263 | KTT | 3 | 45 | Non-RoHS & Green | Call TI | Level-3-235C-168 HR | 0 to 125 | LMS1587 CS-ADJ | |

| Orderable Device | Status (1) | Package Type | Package Drawing | Pins | Package Qty | Eco Plan (2) | Lead finish/ Ball material (6) | MSL Peak Temp (3) | Op Temp (°C) | Device Marking (4/5) | Samples |
|---------------------|---------------|------------------|-----------------|------|-------------|------------------------|--------------------------------------|----------------------|--------------|-------------------------|-------------------------|
| LMS1587CS-ADJ/NOPB | ACTIVE | DDPAK/ TO-263 | KTT | 3 | 45 | RoHS-Exempt & Green | SN | Level-3-245C-168 HR | 0 to 125 | LMS1587 CS-ADJ | Samples |
| LMS1587CSX-1.5/NOPB | ACTIVE | DDPAK/ TO-263 | KTT | 3 | 500 | RoHS-Exempt & Green | SN | Level-3-245C-168 HR | 0 to 125 | LMS1587 CS-1.5 | Samples |
| LMS1587CSX-3.3/NOPB | ACTIVE | DDPAK/ TO-263 | KTT | 3 | 500 | RoHS-Exempt & Green | SN | Level-3-245C-168 HR | 0 to 125 | LMS1587 CS-3.3 | Samples |
| LMS1587CSX-ADJ/NOPB | ACTIVE | DDPAK/ TO-263 | KTT | 3 | 500 | RoHS-Exempt & Green | SN | Level-3-245C-168 HR | 0 to 125 | LMS1587 CS-ADJ | Samples |
| LMS1587CT-3.3 | NRND | TO-220 | NDE | 3 | 45 | Non-RoHS & Green | Call TI | Level-1-NA-UNLIM | 0 to 125 | LMS1587 CT-3.3 | |
| LMS1587CT-3.3/NOPB | ACTIVE | TO-220 | NDE | 3 | 45 | RoHS & Green | SN | Level-1-NA-UNLIM | 0 to 125 | LMS1587 CT-3.3 | Samples |
| LMS1587CT-ADJ/NOPB | ACTIVE | TO-220 | NDE | 3 | 45 | RoHS & Green | SN | Level-1-NA-UNLIM | 0 to 125 | LMS1587 CT-ADJ | Samples |
| LMS1587IS-1.5 | NRND | DDPAK/ TO-263 | KTT | 3 | 45 | Non-RoHS & Green | Call TI | Level-3-235C-168 HR | -40 to 125 | LMS1587 IS-1.5 | |
| LMS1587IS-1.5/NOPB | ACTIVE | DDPAK/ TO-263 | KTT | 3 | 45 | RoHS-Exempt & Green | SN | Level-3-245C-168 HR | -40 to 125 | LMS1587 IS-1.5 | Samples |
| LMS1587IS-3.3 | NRND | DDPAK/ TO-263 | KTT | 3 | 45 | Non-RoHS & Green | Call TI | Level-3-235C-168 HR | -40 to 125 | LMS1587 IS-3.3 | |
| LMS1587IS-3.3/NOPB | ACTIVE | DDPAK/ TO-263 | KTT | 3 | 45 | RoHS-Exempt & Green | SN | Level-3-245C-168 HR | -40 to 125 | LMS1587 IS-3.3 | Samples |
| LMS1587IS-ADJ | NRND | DDPAK/ TO-263 | KTT | 3 | 45 | Non-RoHS & Green | Call TI | Level-3-235C-168 HR | -40 to 125 | LMS1587 IS-ADJ | |
| LMS1587IS-ADJ/NOPB | ACTIVE | DDPAK/ TO-263 | KTT | 3 | 45 | RoHS-Exempt & Green | SN | Level-3-245C-168 HR | -40 to 125 | LMS1587 IS-ADJ | Samples |
| LMS1587ISX-3.3/NOPB | ACTIVE | DDPAK/ TO-263 | KTT | 3 | 500 | RoHS-Exempt & Green | SN | Level-3-245C-168 HR | -40 to 125 | LMS1587 IS-3.3 | Samples |
| LMS1587ISX-ADJ/NOPB | ACTIVE | DDPAK/ TO-263 | KTT | 3 | 500 | RoHS-Exempt & Green | SN | Level-3-245C-168 HR | -40 to 125 | LMS1587 IS-ADJ | Samples |
| LMS1587IT-1.5/NOPB | ACTIVE | TO-220 | NDE | 3 | 45 | RoHS & Green | SN | Level-1-NA-UNLIM | -40 to 125 | LMS1587 IT-1.5 | Samples |

(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⁾ **RoHS:** TI defines "RoHS" to mean semiconductor products that are compliant with the current EU RoHS requirements for all 10 RoHS substances, including the requirement that RoHS substance do not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, "RoHS" products are suitable for use in specified lead-free processes. TI may reference these types of products as "Pb-Free".

RoHS Exempt: TI defines "RoHS Exempt" to mean products that contain lead but are compliant with EU RoHS pursuant to a specific EU RoHS exemption.

Green: TI defines "Green" to mean the content of Chlorine (Cl) and Bromine (Br) based flame retardants meet JS709B low halogen requirements of <=1000ppm threshold. Antimony trioxide based flame retardants must also meet the <=1000ppm threshold requirement.

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

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TAPE AND REEL INFORMATION

QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE


*All dimensions are nominal

| Device | Package Type | Package Drawing | Pins | SPQ | Reel Diameter (mm) | Reel Width W1 (mm) | A0 (mm) | B0 (mm) | K0 (mm) | P1 (mm) | W (mm) | Pin1 Quadrant |
|--------------------------|------------------|-----------------|------|-----|--------------------|--------------------|---------|---------|---------|---------|--------|---------------|
| LMS1585ACSX-1.5/NOPB | DDPAK/ TO-263 | KTT | 3 | 500 | 330.0 | 24.4 | 10.75 | 14.85 | 5.0 | 16.0 | 24.0 | Q2 |
| LMS1585ACSX-3.3/NOPB | DDPAK/ TO-263 | KTT | 3 | 500 | 330.0 | 24.4 | 10.75 | 14.85 | 5.0 | 16.0 | 24.0 | Q2 |
| LMS1585ACSX- ADJ/NOPB | DDPAK/ TO-263 | KTT | 3 | 500 | 330.0 | 24.4 | 10.75 | 14.85 | 5.0 | 16.0 | 24.0 | Q2 |
| LMS1585AISX-3.3/NO | DDPAK/ TO-263 | KTT | 3 | 500 | 330.0 | 24.4 | 10.75 | 14.85 | 5.0 | 16.0 | 24.0 | Q2 |
| LMS1587CSX-1.5/NOPB | DDPAK/ TO-263 | KTT | 3 | 500 | 330.0 | 24.4 | 10.75 | 14.85 | 5.0 | 16.0 | 24.0 | Q2 |
| LMS1587CSX-3.3/NOPB | DDPAK/ TO-263 | KTT | 3 | 500 | 330.0 | 24.4 | 10.75 | 14.85 | 5.0 | 16.0 | 24.0 | Q2 |
| LMS1587CSX-ADJ/NOPB | DDPAK/ TO-263 | KTT | 3 | 500 | 330.0 | 24.4 | 10.75 | 14.85 | 5.0 | 16.0 | 24.0 | Q2 |
| LMS1587ISX-3.3/NOPB | DDPAK/ TO-263 | KTT | 3 | 500 | 330.0 | 24.4 | 10.75 | 14.85 | 5.0 | 16.0 | 24.0 | Q2 |
| LMS1587ISX-ADJ/NOPB | DDPAK/ TO-263 | KTT | 3 | 500 | 330.0 | 24.4 | 10.75 | 14.85 | 5.0 | 16.0 | 24.0 | Q2 |

TAPE AND REEL BOX DIMENSIONS


*All dimensions are nominal

| Device | Package Type | Package Drawing | Pins | SPQ | Length (mm) | Width (mm) | Height (mm) |
|--------------------------|--------------|-----------------|------|-----|-------------|------------|-------------|
| LMS1585ACSX-1.5/NOPB | DDPAK/TO-263 | KTT | 3 | 500 | 367.0 | 367.0 | 45.0 |
| LMS1585ACSX-3.3/NOPB | DDPAK/TO-263 | KTT | 3 | 500 | 367.0 | 367.0 | 45.0 |
| LMS1585ACSX- ADJ/NOPB | DDPAK/TO-263 | KTT | 3 | 500 | 367.0 | 367.0 | 45.0 |
| LMS1585AISX-3.3/NO | DDPAK/TO-263 | KTT | 3 | 500 | 367.0 | 367.0 | 45.0 |
| LMS1587CSX-1.5/NOPB | DDPAK/TO-263 | KTT | 3 | 500 | 367.0 | 367.0 | 45.0 |
| LMS1587CSX-3.3/NOPB | DDPAK/TO-263 | KTT | 3 | 500 | 367.0 | 367.0 | 45.0 |
| LMS1587CSX-ADJ/NOPB | DDPAK/TO-263 | KTT | 3 | 500 | 367.0 | 367.0 | 45.0 |
| LMS1587ISX-3.3/NOPB | DDPAK/TO-263 | KTT | 3 | 500 | 367.0 | 367.0 | 45.0 |
| LMS1587ISX-ADJ/NOPB | DDPAK/TO-263 | KTT | 3 | 500 | 367.0 | 367.0 | 45.0 |

TUBE


*All dimensions are nominal

| Device | Package Name | Package Type | Pins | SPQ | L (mm) | W (mm) | T (µm) | B (mm) |
|---------------------|--------------|--------------|------|-----|--------|--------|--------|--------|
| LMS1585ACS-1.5 | KTT | TO-263 | 3 | 45 | 502 | 25 | 8204.2 | 9.19 |
| LMS1585ACS-1.5 | KTT | TO-263 | 3 | 45 | 502 | 25 | 8204.2 | 9.19 |
| LMS1585ACS-1.5/NOPB | KTT | TO-263 | 3 | 45 | 502 | 25 | 8204.2 | 9.19 |
| LMS1585ACS-3.3 | KTT | TO-263 | 3 | 45 | 502 | 25 | 8204.2 | 9.19 |
| LMS1585ACS-3.3 | KTT | TO-263 | 3 | 45 | 502 | 25 | 8204.2 | 9.19 |
| LMS1585ACS-3.3/NOPB | KTT | TO-263 | 3 | 45 | 502 | 25 | 8204.2 | 9.19 |
| LMS1585ACT-1.5/NOPB | NDE | TO-220 | 3 | 45 | 502 | 33 | 6985 | 4.06 |
| LMS1585ACT-3.3/NOPB | NDE | TO-220 | 3 | 45 | 502 | 33 | 6985 | 4.06 |
| LMS1585AIS-1.5 | KTT | TO-263 | 3 | 45 | 502 | 25 | 8204.2 | 9.19 |
| LMS1585AIS-1.5 | KTT | TO-263 | 3 | 45 | 502 | 25 | 8204.2 | 9.19 |
| LMS1585AIS-1.5/NOPB | KTT | TO-263 | 3 | 45 | 502 | 25 | 8204.2 | 9.19 |
| LMS1585AIS-3.3/NOPB | KTT | TO-263 | 3 | 45 | 502 | 25 | 8204.2 | 9.19 |
| LMS1587CS-1.5/NOPB | KTT | TO-263 | 3 | 45 | 502 | 25 | 8204.2 | 9.19 |
| LMS1587CS-3.3/NOPB | KTT | TO-263 | 3 | 45 | 502 | 25 | 8204.2 | 9.19 |
| LMS1587CS-ADJ | KTT | TO-263 | 3 | 45 | 502 | 25 | 8204.2 | 9.19 |
| LMS1587CS-ADJ | KTT | TO-263 | 3 | 45 | 502 | 25 | 8204.2 | 9.19 |
| LMS1587CS-ADJ/NOPB | KTT | TO-263 | 3 | 45 | 502 | 25 | 8204.2 | 9.19 |
| LMS1587CT-3.3 | NDE | TO-220 | 3 | 45 | 502 | 33 | 6985 | 4.06 |
| LMS1587CT-3.3 | NDE | TO-220 | 3 | 45 | 502 | 33 | 6985 | 4.06 |
| LMS1587CT-3.3/NOPB | NDE | TO-220 | 3 | 45 | 502 | 33 | 6985 | 4.06 |
| LMS1587CT-ADJ/NOPB | NDE | TO-220 | 3 | 45 | 502 | 33 | 6985 | 4.06 |
| LMS1587IS-1.5 | KTT | TO-263 | 3 | 45 | 502 | 25 | 8204.2 | 9.19 |
| LMS1587IS-1.5 | KTT | TO-263 | 3 | 45 | 502 | 25 | 8204.2 | 9.19 |
| LMS1587IS-1.5/NOPB | KTT | TO-263 | 3 | 45 | 502 | 25 | 8204.2 | 9.19 |
| LMS1587IS-3.3 | KTT | TO-263 | 3 | 45 | 502 | 25 | 8204.2 | 9.19 |
| LMS1587IS-3.3 | KTT | TO-263 | 3 | 45 | 502 | 25 | 8204.2 | 9.19 |
| LMS1587IS-3.3/NOPB | KTT | TO-263 | 3 | 45 | 502 | 25 | 8204.2 | 9.19 |
| LMS1587IS-ADJ | KTT | TO-263 | 3 | 45 | 502 | 25 | 8204.2 | 9.19 |
| LMS1587IS-ADJ | KTT | TO-263 | 3 | 45 | 502 | 25 | 8204.2 | 9.19 |

| Device | Package Name | Package Type | Pins | SPQ | L (mm) | W (mm) | T (μm) | B (mm) |
|--------------------|--------------|--------------|------|-----|--------|--------|--------|--------|
| LMS1587IS-ADJ/NOPB | KTT | TO-263 | 3 | 45 | 502 | 25 | 8204.2 | 9.19 |
| LMS1587IT-1.5/NOPB | NDE | TO-220 | 3 | 45 | 502 | 33 | 6985 | 4.06 |

NDE0003B



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