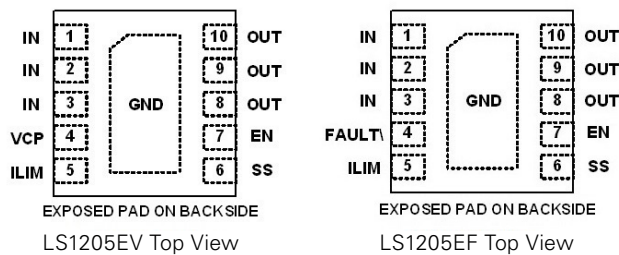


# LS1205ExD33 Series

## 18V, 5A eFuse with Programmable Current Limit and Output Voltage Clamp



### Pinout Designation



### Pin Description

| LS1205EV | LS1205EF | Pin Name | Description                                                                                                                                                                                                                                                                                                    |      |     |                                         |                                         |     |      |     |      |      |    |     |      |       |     |      |       |
|----------|----------|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----|-----------------------------------------|-----------------------------------------|-----|------|-----|------|------|----|-----|------|-------|-----|------|-------|
| 1, 2, 3  | 1, 2, 3  | IN       | Power input pin.                                                                                                                                                                                                                                                                                               |      |     |                                         |                                         |     |      |     |      |      |    |     |      |       |     |      |       |
| 4        | -        | VCP      | LS1205EV only output clamp voltage selection based on the input voltage.Pull VCP pin to High by connecting a resistor to IN or pull VCP pin to Low by connecting a resistor to ground, or float VCP Pin to select different output clamping thresholds. Recommend to decoupling this pin with 0.1μF capacitor. |      |     |                                         |                                         |     |      |     |      |      |    |     |      |       |     |      |       |
|          |          |          | <table><tr><td>VCP</td><td colspan="2">VIN</td><td>V<sub>OUT</sub> Clamping Threshold Typ</td></tr><tr><td>Low</td><td>3.3V</td><td>&gt;4V</td><td>3.8V</td></tr><tr><td>High</td><td>5V</td><td>&gt;6V</td><td>5.7V</td></tr><tr><td>FLOAT</td><td>12V</td><td>&gt;16V</td><td>14.4V</td></tr></table>        | VCP  | VIN |                                         | V <sub>OUT</sub> Clamping Threshold Typ | Low | 3.3V | >4V | 3.8V | High | 5V | >6V | 5.7V | FLOAT | 12V | >16V | 14.4V |
|          |          |          | VCP                                                                                                                                                                                                                                                                                                            | VIN  |     | V <sub>OUT</sub> Clamping Threshold Typ |                                         |     |      |     |      |      |    |     |      |       |     |      |       |
|          |          |          | Low                                                                                                                                                                                                                                                                                                            | 3.3V | >4V | 3.8V                                    |                                         |     |      |     |      |      |    |     |      |       |     |      |       |
|          |          |          | High                                                                                                                                                                                                                                                                                                           | 5V   | >6V | 5.7V                                    |                                         |     |      |     |      |      |    |     |      |       |     |      |       |
| FLOAT    | 12V      | >16V     | 14.4V                                                                                                                                                                                                                                                                                                          |      |     |                                         |                                         |     |      |     |      |      |    |     |      |       |     |      |       |
| Low      | 3.3V     | >4V      | 3.8V                                                                                                                                                                                                                                                                                                           |      |     |                                         |                                         |     |      |     |      |      |    |     |      |       |     |      |       |
| High     | 5V       | >6V      | 5.7V                                                                                                                                                                                                                                                                                                           |      |     |                                         |                                         |     |      |     |      |      |    |     |      |       |     |      |       |
| FLOAT    | 12V      | >16V     | 14.4V                                                                                                                                                                                                                                                                                                          |      |     |                                         |                                         |     |      |     |      |      |    |     |      |       |     |      |       |
| -        | 4        | FAULT    | LS1205EF Only. Fault event indicator. Open-drain output that asserts low to indicate input under-voltage, input over-voltage, output short and thermal shutdown fault events.                                                                                                                                  |      |     |                                         |                                         |     |      |     |      |      |    |     |      |       |     |      |       |
| 5        | 5        | ILIM     | Current limit program pin. Program the current limit by connecting a resistor to ground.                                                                                                                                                                                                                       |      |     |                                         |                                         |     |      |     |      |      |    |     |      |       |     |      |       |
| 6        | 6        | SS       | Soft Start time program pin. Connect a capacitor to ground to program the soft start time.                                                                                                                                                                                                                     |      |     |                                         |                                         |     |      |     |      |      |    |     |      |       |     |      |       |
| 7        | 7        | EN       | Enable interface pin. EN has accurate ON/OFF threshold of 1.29V and 1.19V respectively. Pull it above ON threshold to enable the IC. Pull it below OFF threshold to disable the IC.                                                                                                                            |      |     |                                         |                                         |     |      |     |      |      |    |     |      |       |     |      |       |
| 8, 9,10  | 8, 9,10  | OUT      | Power output pin.                                                                                                                                                                                                                                                                                              |      |     |                                         |                                         |     |      |     |      |      |    |     |      |       |     |      |       |
| EP       | EP       | GND      | Ground pin.                                                                                                                                                                                                                                                                                                    |      |     |                                         |                                         |     |      |     |      |      |    |     |      |       |     |      |       |

### Description

The LS1205E integrated load switch provides an easy circuit protection to power the system. The devices use few external components and provide multiple protection modes. They are a robust defense against overload, short circuit, input voltage surge and excessive inrush current. The switch's low  $R_{DS(ON)}$  helps to reduce power loss during normal operation. Set the current limit level with an external resistor. Protect against input over-voltage events via internal clamp circuitry to a safe output voltage. Programmable soft-start controls the slew rate of the output voltage to limit inrush current during plug in. It integrates thermal fold-back function and over temperature shutdown protection. They are available in low profile 10 leads DFN 3mm x 3mm package.

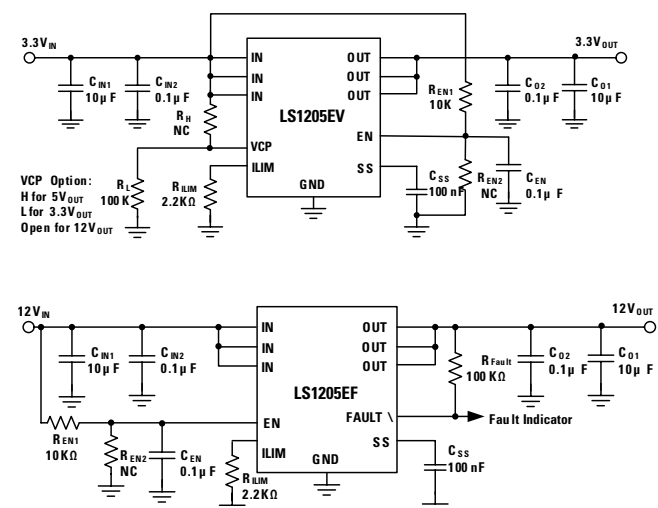
### Features & Benefits

- Wide Input Voltage Range from 2.7V to 18V
- LS1205EV: External Selectable Input Range and Clamping Output Voltage Threshold
- LS1205EF: Open Drain Fault Indicator FAULT
- Output Discharging Function
- Integrate a 25mΩ Low  $R_{DS(ON)}$  Protection Switch
- External Programmable Soft-Start Time
- External Programmable Current Limit up to 5A
- Short-circuit Protection
- Enable Control Pin
- Thermal Shutdown Protection & Auto Recovery
- DFN3x3\_10L Package
- Pb-Free RoHS compliant

### Applications

- HDD and SSD Drives
- Adapter Powered Devices
- PC / Notebook
- FAN Control
- Networking

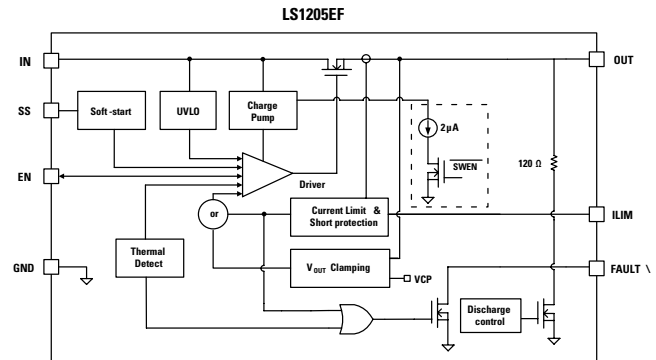
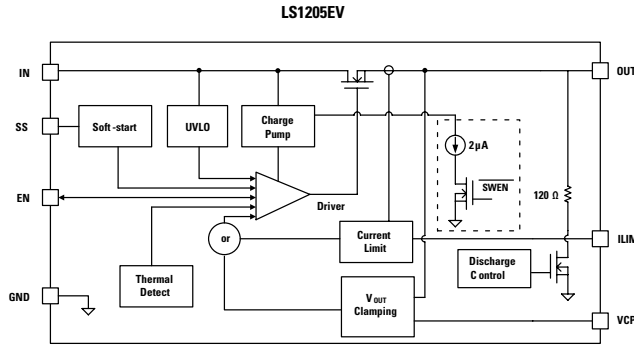
### Typical Applications



# LS1205ExD33 Series

## 18V, 5A eFuse with Programmable Current Limit and Output Voltage Clamp

### Functional Block Diagram



### Absolute Maximum Rating (Reference to GND)

| Symbol                           | Value        | Units |
|----------------------------------|--------------|-------|
| VIN, EN, VCP, FAULT\             | -0.3 to +20  | V     |
| The other Pins                   | -0.3 to +6.5 | V     |
| ESD, Human Body Model (HBM)      | ±2000        | V     |
| Junction Temperature Range       | -40 to +125  | °C    |
| Storage Temperature Range        | -65 to +125  | °C    |
| Lead Temperature (Soldering 10s) | 260          | °C    |

#### Notes:

1. Stress exceeding those listed "Absolute Maximum Ratings" may damage the device.
2. ESD HBM testing per JESD22-A114F

### Thermal information

| Symbol                                            | Value | Units |
|---------------------------------------------------|-------|-------|
| Maximum Power Dissipation (T <sub>A</sub> =25°C ) | 1.89  | W     |
| Thermal Resistance (θ <sub>JA</sub> )             | 53    | °C/W  |
| Thermal Resistance (θ <sub>JC</sub> )             | 25    | °C/W  |

#### Notes:

1. Measured on JESD51-7, 4-Layer PCB.
2. The maximum allowable power dissipation is a function of the maximum junction temperature T<sub>J,MAX</sub>, the junction to ambient thermal resistance θ<sub>JA</sub>, and the ambient temperature T<sub>A</sub>. The maximum allowable continuous power dissipation at any ambient temperature is calculated by P<sub>D,MAX</sub> = (T<sub>J,MAX</sub> - T<sub>A</sub>) / θ<sub>JA</sub>. Exceeding the maximum allowable power dissipation will cause excessive die temperature, and the regulator will go into thermal shutdown. Internal thermal shutdown circuitry protects the device from permanent damage.

### Recommend Operating Conditions

| Symbol                           | Value       | Units |
|----------------------------------|-------------|-------|
| Input Voltage (V <sub>IN</sub> ) | +2.7 to +18 | V     |
| Junction Temperature Range       | +125        | °C    |

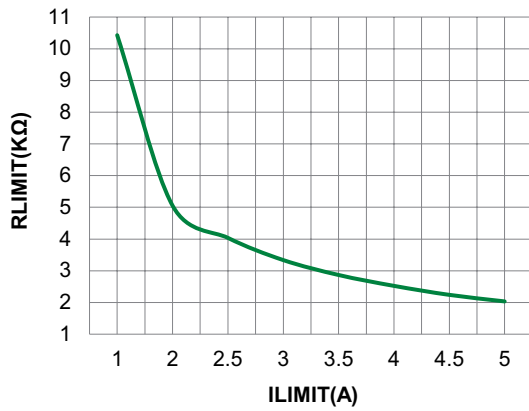
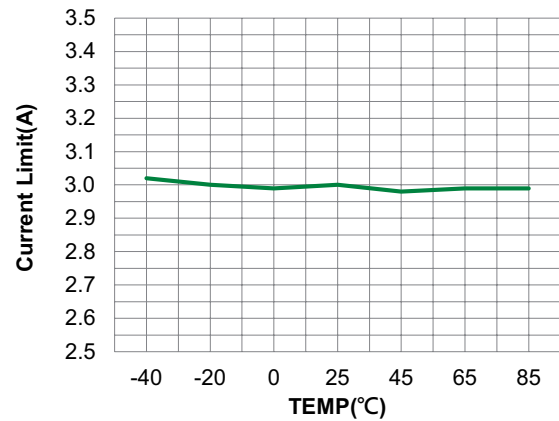
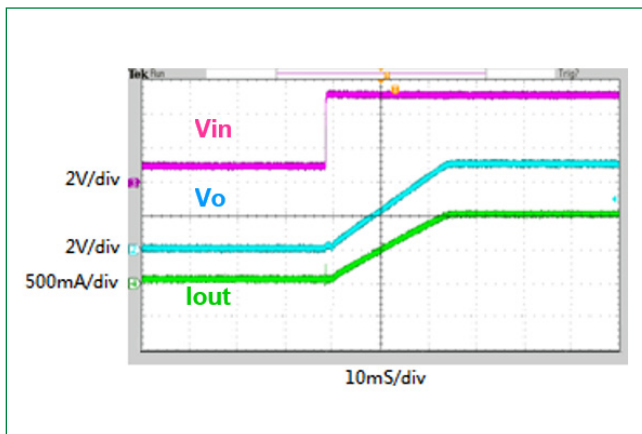
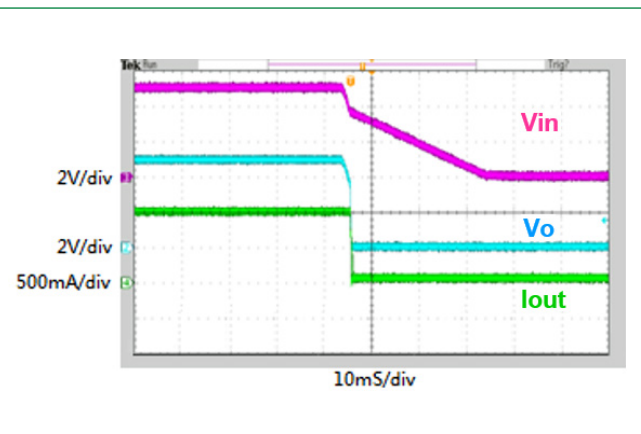
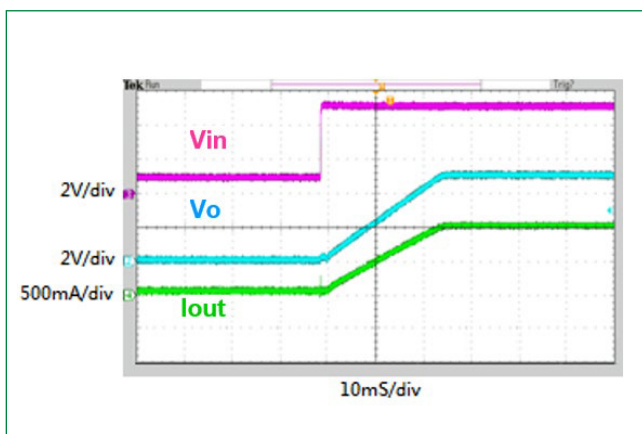
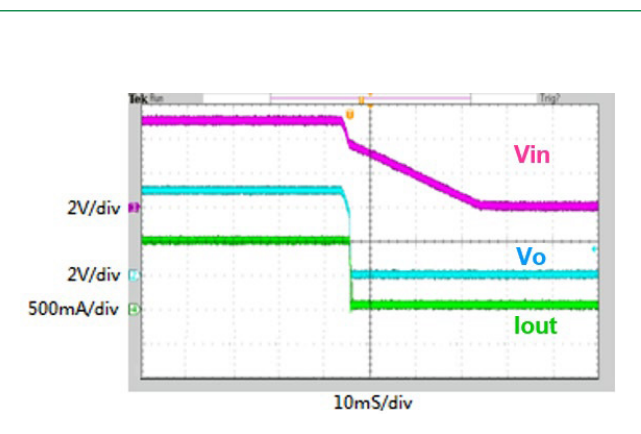
**Notes:** The device is not guaranteed to function outside of the recommended operating conditions.

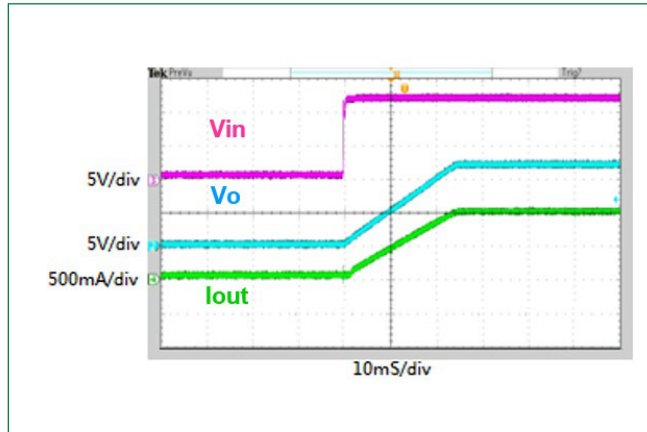
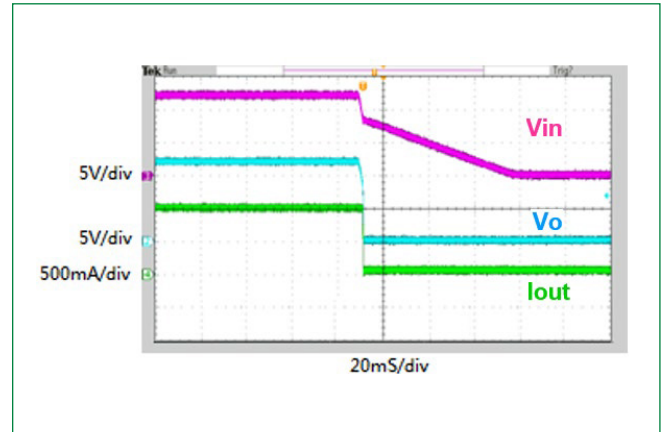
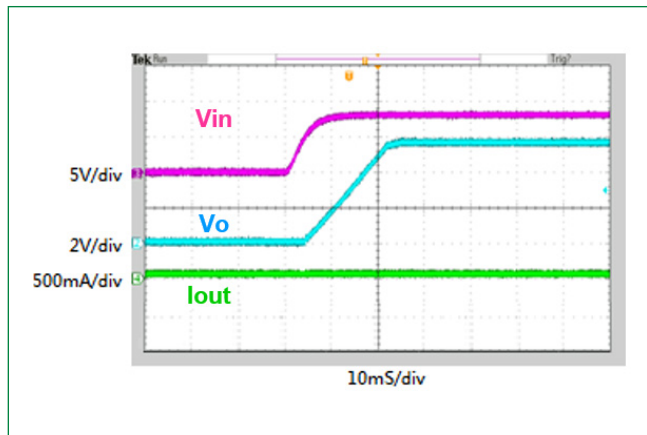
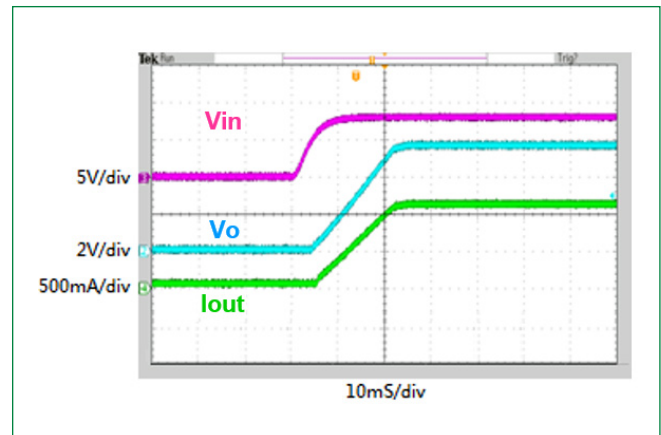
# LS1205ExD33 Series

## 18V, 5A eFuse with Programmable Current Limit and Output Voltage Clamp

**Electrical Characteristics** ( $T_A = +25^\circ\text{C}$ ,  $V_{IN}=5\text{V}$ ,  $R_{LIM}=10\text{k}\Omega$ ,  $C_{SST}=100\text{nF}$ ,  $C_{IN}=10\mu\text{F}$ , unless otherwise specified)

| Symbol          | Parameter                       | Test Conditions                           | Min  | Typ  | Max  | Unit             |
|-----------------|---------------------------------|-------------------------------------------|------|------|------|------------------|
| $V_{IN}$        | Input Voltage Range             |                                           | 2.7  |      | 18   | V                |
| $I_{BIAS}$      | Quiescent Current               |                                           |      | 200  | 240  | $\mu\text{A}$    |
| $I_{SHDN}$      | Shutdown Current                | $V_{EN}=0\text{V}$                        |      | 6.5  | 10   | $\mu\text{A}$    |
| $V_{ENR}$       | EN Turn-on Threshold            | EN Rising                                 |      | 1.29 |      | V                |
| $V_{ENF}$       | EN Turn-off Threshold           | EN Falling                                |      | 1.19 |      | V                |
| $V_{ENHYS}$     | EN Hysteresis                   |                                           |      | 100  |      | mV               |
| $I_{EN}$        | EN Input Leakage Current        | $0\text{V} \leq V_{EN} \leq 5\text{V}$    | -200 |      | 200  | nA               |
| $V_{CLP}$       | Clamping Output Voltage         | LS1205EV VCP=LOW                          |      | 3.8  |      | V                |
|                 |                                 | LS1205EV VCP=HIGH                         |      | 5.7  |      | V                |
|                 |                                 | LS1205EV VCP=FLOAT                        |      | 14.4 |      | V                |
|                 |                                 | LS1205EF                                  |      | 14.4 |      | V                |
| $V_{UVLO}$      | Input UVLO Threshold            | LS1205EV VCP=LOW                          | 2.4  | 2.55 | 2.72 | V                |
|                 |                                 | LS1205EV VCP=HIGH                         | 3.4  | 3.6  | 3.8  | V                |
|                 |                                 | LS1205EV VCP=FLOAT                        | 3.4  | 3.6  | 3.8  | V                |
|                 |                                 | LS1205EF                                  | 3.4  | 3.6  | 3.8  | V                |
| $V_{HYS}$       | UVLO hysteresis                 | LS1205EV VCP=LOW                          |      | 150  |      | mV               |
|                 |                                 | LS1205EV VCP=HIGH                         |      | 300  |      | mV               |
|                 |                                 | LS1205EV VCP=FLOAT                        |      | 300  |      | mV               |
|                 |                                 | LS1205EF                                  |      | 300  |      | mV               |
| $I_{FIK}$       | FAULT Leakage Current           | LS1205EF, No Fault, $V_{FAULT}=5\text{V}$ |      | 0.01 | 1    | $\mu\text{A}$    |
|                 | FAULT Output Low Voltage        | LS1205EF, Fault, $I_{SINK}=1\text{mA}$    |      |      | 0.5  | V                |
| $R_{DS(ON)}$    | Protection FET RON              |                                           |      | 25   |      | m $\Omega$       |
| $I_{INLIM}$     | Current Limit Program Range     |                                           | 1    |      | 5    | A                |
| $I_{INLIM}$     | Current Limit                   | $R_{LIM}=2.7\text{k}\Omega$               | 3.6  | 4    | 4.5  | A                |
| $K_{LIM}$       | Current Limit Setting Factor    | $I_{INLIM}=1\text{A}\sim 5\text{A}$       |      | 10.5 |      | A*k $\Omega$     |
| $T_{SS}$        | Soft-start Time                 | $C_{SS}=100\text{nF}$                     |      | 25   |      | msec             |
|                 |                                 | SS float                                  | 1.2  | 1.7  | 2.2  | msec             |
| $R_{Discharge}$ | OUT Discharging Resistance      | $V_{IN}=5\text{V}$ and $V_{EN}=0\text{V}$ |      | 120  |      | $\Omega$         |
| $T_{SD}$        | Thermal Shutdown Temperature    |                                           |      | 140  |      | $^\circ\text{C}$ |
| $T_{HYS}$       | Thermal Shutdown Hysteresis     |                                           |      | 20   |      | $^\circ\text{C}$ |
| $T_{LIIM}$      | Junction Temperature Regulation |                                           |      | 125  |      | $^\circ\text{C}$ |

**LS1205ExD33 Series****18V, 5A eFuse with Programmable Current Limit and Output Voltage Clamp****Programmable Current Limit** $(V_{IN}=3.3V, 5V \text{ and } 12V)$ **Programmable Current Limit** $(RLIM=3.3K)$ **Programmable Soft-start Time** $(3.3V \text{ Mode}, I_O=1A, C_{SS}=100nF)$ **Shutdown** $(3.3V \text{ Mode}, I_O=1A, C_{SS}=100nF)$ **Programmable Soft-start Time** $(5V \text{ Mode}, I_O=1A, C_{SS}=100nF)$ **Shutdown** $(5V \text{ Mode}, I_O=1A, C_{SS}=100nF)$ 

**LS1205ExD33 Series****18V, 5A eFuse with Programmable Current Limit and Output Voltage Clamp****Programmable Soft-start Time**(12V Mode,  $I_O=1A$ ,  $C_{SS}=100nF$ )**Shutdown**(12V Mode,  $I_O=1A$ ,  $C_{SS}=100nF$ )**Over Voltage Protection**(5V Mode,  $V_{IN}=8V$ ,  $I_O=0A$ )**Over Voltage Protection**(5V Mode,  $V_{IN}=8V$ ,  $I_O=1A$ )

# LS1205ExD33 Series

## 18V, 5A eFuse with Programmable Current Limit and Output Voltage Clamp

### Detailed Description

The LS1205E is a current limit switch with integrated power switch that is used to manage current/voltage/start-up voltage ramp to connected load. A high level on EN pin enables the internal MOSFET. As VIN rises, the internal MOSFET of the device will start conducting and allow current to flow from VIN to OUT. The internal MOSFET turns off when EN is held low. The user also can control the output voltage ramp time by connecting a program capacitor between SS pin and GND.

After a successful start-up sequence, the device will actively monitors its load current and input voltage, ensuring that the overload current limit ILIMIT programmed by pin ILIMIT is not exceeded. It also monitors input voltage and ensures any spikes are safely clamped to pre-determined level at the output which is selected by pin VCP. This keeps the output device safe from harmful voltage and current transients. The device also has built-in thermal sensor. In the event device temperature ( $T_J$ ) exceeds thermal regulation point, current limit will be decreased until  $T_J$  is regulated at around 125°C and when device temperature ( $T_J$ ) exceeds  $T_{SHDN}$ , typically 140°C, the thermal shutdown circuitry will shut down the internal MOSFET thereby disconnecting the load from the supply. The LS1205E device will remain off during a cooling period until device temperature falls below  $T_{SHDN} - 20^\circ\text{C}$ , after which it will attempt to restart.

### Application Information

#### Input and Output Capacitor Selection

Bypass IN to GND with 0.1μF input capacitor. The LS1205E require ≥10μF Input and output capacitor connected to GND. X7R type capacitors are recommended, but X5R and others may be used.

#### Enable

Enable interface pin. EN has accurate ON/OFF threshold of 1.29V and 1.19V respectively. Pull it above ON threshold High to enable the IC. Pull it below OFF threshold to disable the IC.

#### Soft Start

Connect a program capacitor from this pin to GND to control the slew rate of the output voltage at power-on. This pin can be left floating to obtain a predetermined slew rate (minimum TSS) on the output. The soft start time with different capacitor is below:

$$T_{SS} = \begin{cases} T_{SS\_INT}, & \text{No external } C_{SS} \\ C_{SS} * R_{INT}, & T_{SS} > T_{SS\_INT} \end{cases}$$

| SS cap (nF)      | None | 10  | 56 | 100 |
|------------------|------|-----|----|-----|
| Rise time (msec) | 1.7  | 2.5 | 14 | 25  |

Where,  $T_{SS\_INT}$  is the internally fixed default soft-start time, about 1.7ms, which means there's no any external  $C_{SS}$ ,  $R_{INT}$  is the internal resistor, about 250kΩ

#### Selectable Output Clamping Voltage (LS1205EV Only)

Output clamp voltage selection based on the input voltage. Pull VCP pin to High by connecting a resistor to IN, or pull VCP pin to Low by connecting a resistor to ground, or float VCP Pin to select different output clamping thresholds. Recommend to decouple VCP pin with a 0.1μF capacitor to GND.

| VCP   | IN   |      | Clamping Threshold |
|-------|------|------|--------------------|
|       |      |      | TYP.               |
| Low   | 3.3V | >4V  | 3.8V               |
| High  | 5V   | >6V  | 5.7V               |
| Float | 12V  | >16V | 14.4V              |

# LS1205ExD33 Series

## 18V, 5A eFuse with Programmable Current Limit and Output Voltage Clamp

### Current Limit

The user can program the input current limit level for current limited adaptors or sources to prevent the load current from overloading the source. When the input current limit loop is engaged, the input current will be automatically reduced to the programmed level to satisfy the limited input power.

Input current limit can be programmed with below equation:

$$I_{INLIM} = \frac{10.5A * k\Omega}{R_{ILIM}}$$

Where  $R_{LIM}$  is the program resistor at the  $I_{LIM}$  pin.

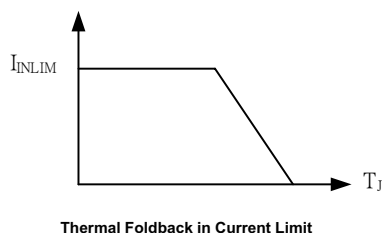
| Program Current Limit Resistance (kΩ) | 10.5 | 5.2 | 4.2 | 3.5 | 3   | 2.7 | 2.4 | 2.1 |
|---------------------------------------|------|-----|-----|-----|-----|-----|-----|-----|
| Current Limit $I_{INLIM}$ (A)         | 1    | 2   | 2.5 | 3   | 3.5 | 4   | 4.5 | 5   |

For the stable system operation, it is recommended to set the current limit level 1.2~1.5 times of the maximum system load current to avoid mis-triggering the current limit and causing system malfunctions.

### Thermal Foldback

The device continuously monitors the load current and keeps it limited to the value programmed by  $R_{ILIM}$ . In any event, normal operation or current limit protection.

If power dissipation in the internal MOSFET  $P_D = (V_{IN} - V_{OUT}) \times I_{OUT}$  is too high, LS1205E will engage thermal foldback to reduce the current limit value so that the case temperature is maintain at around 105°C. In the event device temperature ( $T_J$ ) exceeds  $T_{SHDN}$ , typically 140°C, the thermal shutdown circuitry shuts down the internal MOSFET thereby disconnecting the load from the supply.(the  $T_J$  below should be  $T_{Ambient}$ , and the cross point should be 105°C, and fix the curve as black line)



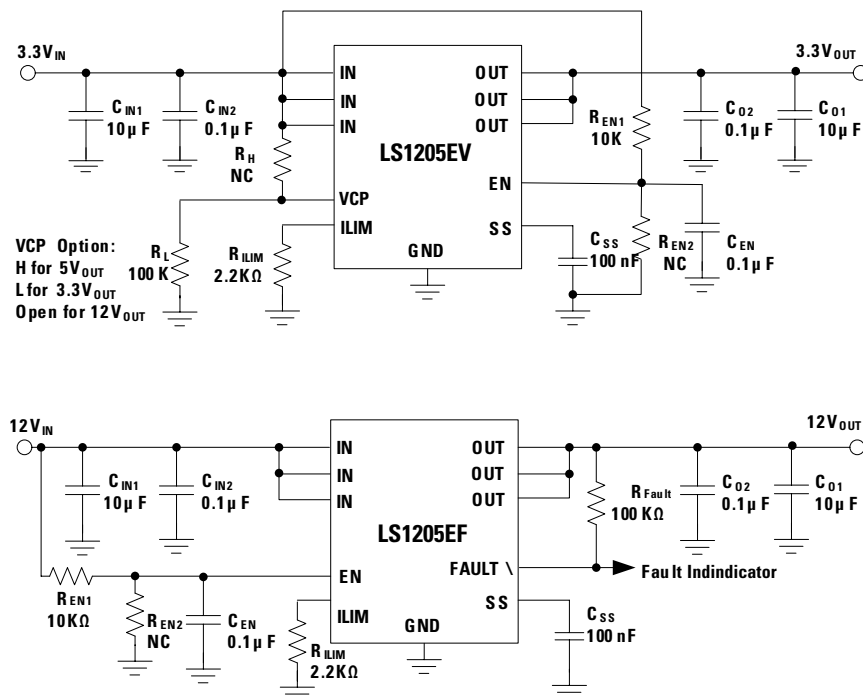
# LS1205ExD33 Series

## 18V, 5A eFuse with Programmable Current Limit and Output Voltage Clamp

### PCB Layout Guideline

- For all applications, a 0.1μF or greater ceramic decoupling capacitor is recommended between IN terminal and GND, and a 0.1μF or greater ceramic decoupling capacitor is recommended between OUT terminal. For hot-plug applications, where input power path inductance is negligible, this capacitor can be eliminated/minimized.
- The optimum placement of decoupling capacitor is closest to the IN and GND terminals of the device. Care must be taken to minimize the loop area formed by the bypass-capacitor connection, the IN terminal, and the GND terminal of the IC.
- High current carrying power path connections should be as short as possible and should be sized to carry at least twice the full-load current.
- The GND terminal must be tied to the PCB ground plane at the terminal of the IC. The PCB ground should be a copper plane or island on the board.
- Locate all support components:  $R_{ILIM}$ ,  $C_{SS}$  and resistors for EN, close to their connection pin. Connect the other end of the component to the GND pin of the device with shortest trace length. The trace routing for the  $R_{ILIM}$  and  $C_{SS}$  components to the device should be as short as possible to reduce parasitic effects on the current limit and soft start timing. These traces should not have any coupling to switching signals on the board.
- Obtaining acceptable performance with alternate layout schemes is possible; however, this layout has been shown to produce good results and is intended as a guideline.

### Application Schematic



# LS1205ExD33 Series

## 18V, 5A eFuse with Programmable Current Limit and Output Voltage Clamp

### Bill of Materials

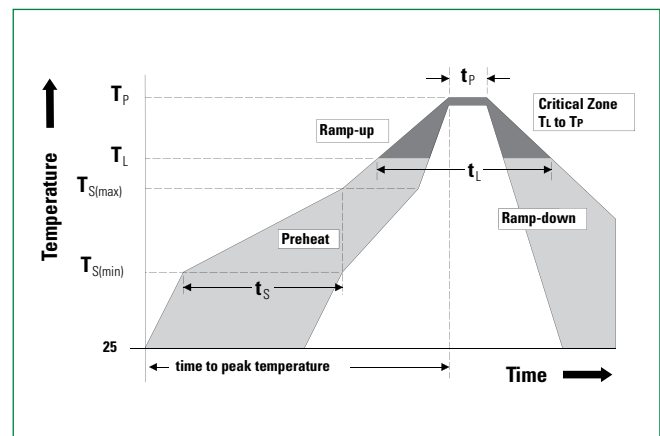
| Qty | Ref                                                  | Value   | Description                 | Package    |
|-----|------------------------------------------------------|---------|-----------------------------|------------|
| 1   | C <sub>IN1</sub>                                     | 10μF    | Ceramic Capacitor, 10V, X5R | 0805       |
| 1   | C <sub>O1</sub>                                      | 10μF    | Ceramic Capacitor, 10V, X5R | 0805       |
| 3   | C <sub>IN2</sub> , C <sub>O2</sub> , C <sub>EN</sub> | 0.1μF   | Ceramic Capacitor, 10V, X5R | 0603       |
| 1   | R <sub>EN1</sub>                                     | 10 KΩ   | Resistor, ±1%               | 0603       |
| 1   | R <sub>EN2</sub>                                     | NC      | Resistor, ±1%               | 0603       |
| 1   | R <sub>L</sub> or R <sub>Fault</sub>                 | 100KΩ   | Resistor, ±1%               | 0603       |
| 0   | R <sub>H</sub>                                       | NA      | Resistor, ±1%               | 0603       |
| 1   | C <sub>SS</sub>                                      | 1nF     | Ceramic Capacitor, 10V, X5R | 0603       |
| 1   | R <sub>ILIM</sub>                                    | 2.2kΩ   | Resistor, ±1%               | 0603       |
| 1   | U1                                                   | LS1205E | eFuse IC                    | DFN3x3_10L |

### Soldering Parameters

|                                                              |                                          |                                  |
|--------------------------------------------------------------|------------------------------------------|----------------------------------|
| Average ramp up rate (T <sub>smin</sub> to T <sub>p</sub> )  |                                          | 1~2°C/second, 3°C/second max.    |
| Preheat & Soak                                               | - Temperature Min (T <sub>s(min)</sub> ) | 150°C                            |
|                                                              | - Temperature Max (T <sub>s(max)</sub> ) | 200°C                            |
|                                                              | - Time (min to max) (t <sub>s</sub> )    | 60 – 120 secs                    |
| Time maintained above                                        | - Temperature(T <sub>L</sub> )           | 217°C                            |
|                                                              | - Time(t <sub>L</sub> )                  | 60~150 seconds                   |
| Peak Temperature (T <sub>p</sub> )                           |                                          | See Classification Temp intable1 |
| Time within 5°C of actual peak Temperature (t <sub>p</sub> ) |                                          | 30 seconds max                   |
| Ramp-down Rate                                               |                                          | 6°C/second max                   |
| Time 25°C to peak Temperature (T <sub>p</sub> )              |                                          | 8 minutes Max.                   |

#### Notes:

1. Tolerance for peak profile Temperature(T<sub>p</sub>) is defined as a supplier minimum and a user maximum.
2. Tolerance for time at peak profile temperature (t<sub>p</sub>) is defined as a supplier minimum and a user maximum.



### Ordering Information

| Part Number | Marking | Package    | Min. Order Qty.  |
|-------------|---------|------------|------------------|
| LS1205EVD33 | 1205EV  | DFN3x3_10L | 5000/Tape & Reel |
| LS1205EFD33 | 1205EF  | DFN3x3_10L | 5000/Tape & Reel |

### Pb-free Process – Classification Temperatures (T<sub>c</sub>)

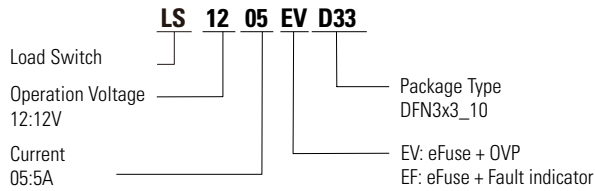
| Package Thickness | Volume mm <sup>3</sup> <350 | Volume mm <sup>3</sup> 350-2000 | Volume mm <sup>3</sup> >2000 |
|-------------------|-----------------------------|---------------------------------|------------------------------|
| <1.6mm            | 260°C                       | 260°C                           | 260°C                        |
| 1.6mm–2.5mm       | 260°C                       | 250°C                           | 245°C                        |
| >2.5mm            | 250°C                       | 245°C                           | 245°C                        |

**Note:** For all temperature information, please refer to top side of the package, measured on the package body surface.

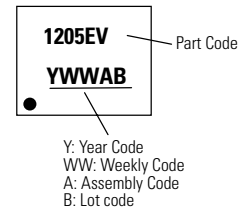
# LS1205ExD33 Series

## 18V, 5A eFuse with Programmable Current Limit and Output Voltage Clamp

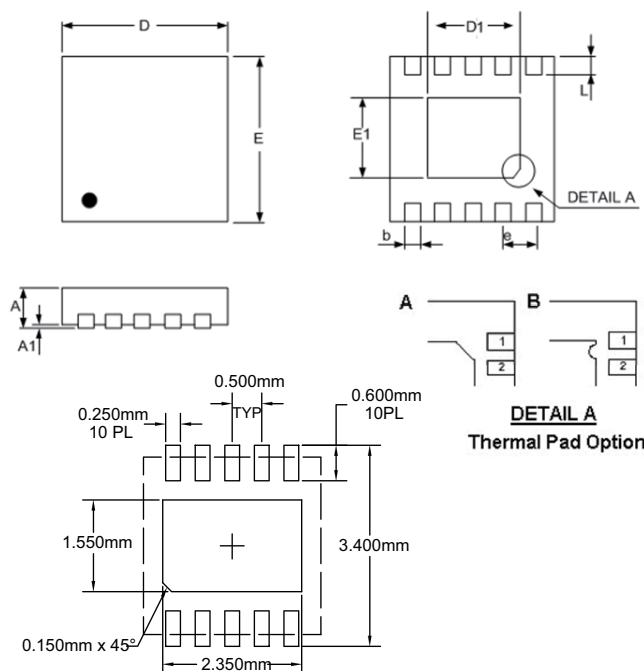
### Part Numbering



### Part Marking



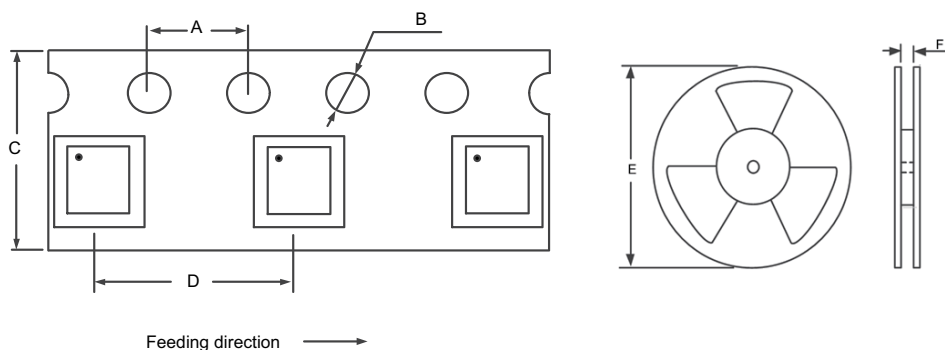
### Dimensions — DFN3x3\_10L



| Dimension | Millimeters |      | Inches |       |
|-----------|-------------|------|--------|-------|
|           | MIN         | MAX  | MIN    | MAX   |
| A         | 0.70        | 0.80 | 0.028  | 0.031 |
| A1        | 0.00        | 0.05 | 0.000  | 0.002 |
| b         | 0.18        | 0.30 | 0.007  | 0.012 |
| D         | 2.90        | 3.10 | 0.114  | 0.122 |
| D1        | 2.10        | 2.60 | 0.083  | 0.102 |
| E         | 2.90        | 3.10 | 0.114  | 0.122 |
| E1        | 1.35        | 1.75 | 0.053  | 0.069 |
| e         | 0.50        |      | 0.020  |       |
| L         | 0.30        | 0.50 | 0.012  | 0.020 |

Recommended Soldering Pad Layout

### Carrier Tape & Reel Specification — DFN3x3\_10L



| Symbol   | Millimeters |
|----------|-------------|
| <b>A</b> | 4.0         |
| <b>B</b> | 1.5         |
| <b>C</b> | 12.0        |
| <b>D</b> | 8.0         |
| <b>E</b> | 13 inch     |
| <b>F</b> | 13.0        |

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