



**DUAL 600mA LDO REGULATOR WITH ENABLE FUNCTION**

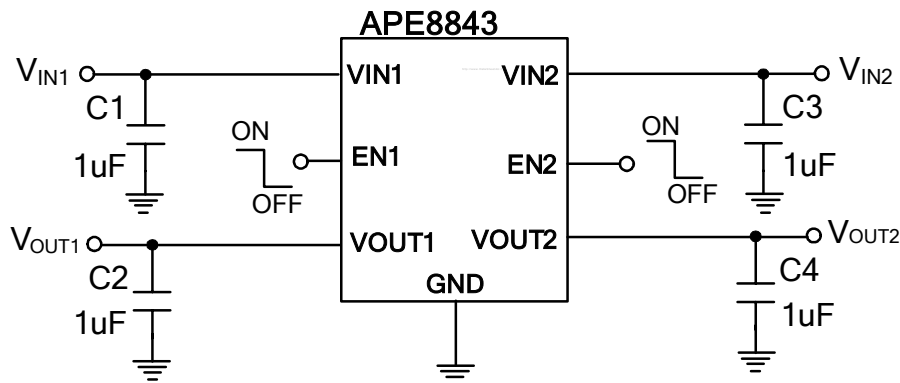
**FEATURES**

- **Input Voltage Range :**  
Channel 1 : 4.2V to 6V  
Channel 2 : 3.2V to 6V
- **Low Quiescent Current is 30uA/per Channel (typ.)**
- **Tight Load and Line Regulation**
- **Fast Transient Response**
- **Current Limit and Thermal Shutdown Protection**
- **Only low-ESR Ceramic Capacitors Required for Stability**
- **Available in the ESOP-8 Pb-Free Package**
- **Halogen Free Product**

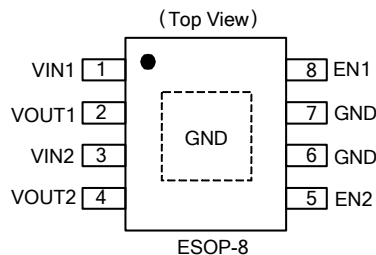
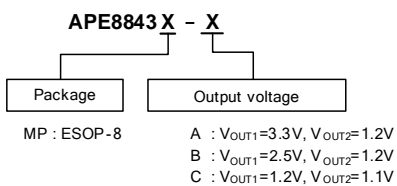
**DESCRIPTION**

The APE8843 is an efficient, precise dual-channel CMOS LDO regulator optimized for ultra-low-quiescent applications. Regulators output1 and output2 are capable of sourcing 600mA of output current. The regulators are stable with output capacitors as low as 1uF, including current limit, thermal shutdown protection, fast transient response, low dropout voltage, high output accuracy, current limiting protection, and high ripple rejection ratio. The APE8843 regulators are able to support individual On/Off function. The APE8843 regulators are available in used ESOP-8 package.

**TYPICAL APPLICATION**



**PACKAGE / ORDERING INFORMATION**





**ABSOLUTE MAXIMUM RATINGS**

|  |                              |
|--|------------------------------|
| $V_{IN1}, V_{IN2}$ Pin Voltage ( $V_{IN1,2}$ )                             | 6.5V                         |
| Output Voltage ( $V_{OUT1}/V_{OUT2}$ )                                     | GND - 0.3 to $V_{IN} + 0.3V$ |
| Enable Voltage ( $V_{EN1}/V_{EN2}$ )                                       | GND - 0.3 to $V_{IN} + 0.3V$ |
| Power Dissipation ( $P_D$ )  | Internally Limited           |
| Storage Temperature Range ( $T_{ST}$ )                                     | -65°C To 150°C               |
| Operating Junction Temperature Range ( $T_{OPJ}$ )                         | -40°C To + 125°C             |
| Junction Temperature ( $T_J$ )   | -40°C To + 150°C             |
| Thermal Resistance from Junction to case ( $R_{thjc}$ )                    | 15°C/W                       |
| Thermal Resistance from Junction to ambient ( $R_{thja}$ ) <sup>Note</sup> | 45°C/W                       |

Note:  $R_{thja}$  is measured with the PCB copper area of approximately 1 in<sup>2</sup>(Multi-layer). That need connect to exposed pad.

**RECOMMENDED OPERATING CONDITIONS**

|  |              |
|--|--------------|
| Input Voltage ( $V_{IN1,2}$ )                  | 3.2 to 6V    |
| Operating Junction Temperature Range ( $T_J$ ) | -40 to 125°C |
| Ambient Temperature ( $T_A$ )                  | -40 to 85°C  |

**ELECTRICAL SPECIFICATIONS**

( $V_{IN}=V_{OUT}+1.5V$  or  $V_{IN}=3.2V$  whichever is greater,  $C_{IN}=1\mu F$ ,  $C_{OUT}=1\mu F$ ,  $T_A=25^\circ C$ , unless otherwise specified)

| Parameter                       | SYM                | TEST CONDITION | MIN | TYP | MAX | UNITS |
|---------------------------------|--------------------|----------------|-----|-----|-----|-------|
| Input Voltage                   | $V_{IN1}$          |                | 4.2 | -   | 6   | V     |
|                                 | $V_{IN2}$          |                | 3.2 | -   | 6   |       |
| Enable Input Threshold          | $V_{EN1/2H}$       | Each channel   | 1.4 | -   | -   | V     |
|                                 | $V_{EN1/2L}$       |                | -   | -   | 0.4 |       |
| Shutdown Current                | $I_{SD1,2}$        |                | -   | -   | 5   | uA    |
| Temperature Shutdown            | $T_{SD1,2}$        |                | -   | 160 | -   | °C    |
| Temperature Shutdown Hysteresis | $\delta T_{SD1,2}$ |                | -   | 35  | -   | °C    |

**Regulator1**

|                         |                    |   |       |      |       |    |
|-------------------------|--------------------|---|-------|------|-------|----|
| Output Voltage Accuracy | $V_{OUT1}$         | $I_{OUT1}=1mA$ (APE8843MP-A)                  | 3.234 | 3.3  | 3.366 | V  |
|                         |                    | $I_{OUT1}=1mA$ (APE8843MP-B)                  | 2.45  | 2.5  | 2.55  |    |
|                         |                    | $I_{OUT1}=1mA$ (APE8843MP-C)                  | 1.176 | 1.2  | 1.224 |    |
| Dropout Voltage (Note1) | $V_{DRO1-A}$       | $I_O=100mA, V_O=3.3V$                         | -     | 250  | 400   | mV |
|                         |                    | $I_O=600mA, V_O=3.3V$                         | -     | 800  | 900   |    |
|                         | $V_{DRO1-B}$       | $I_O=100mA, V_O=2.5V$                         | -     | 250  | 300   | mV |
|                         |                    | $I_O=600mA, V_O=2.5V$                         | -     | 1000 | 1200  |    |
|                         | $V_{DRO1-C}$       | $V_O=1.2V$ guarantee by $V_{IN} \geq 3.2V$    |       |      |       |    |
| Quiescent Current       | $I_{Q1}$           | $I_O=0mA$                                     | -     | 30   | 55    | μA |
| Line Regulation         | $V_{Line1}$        | $I_O=1mA, V_{IN}$ test condition to 6V        | -     | 1    | 5     | mV |
| Load Regulation (Note2) | $\Delta V_{LOAD1}$ | $I_O=0mA$ to 600mA                            | -     | 50   | 100   | mV |
| Current Limit           | $I_{LIMIT1}$       | $R_{Load}=1\Omega$                            | 600   | 650  | -     | mA |
| Ripple Rejection        | PSRR1              | $I_O=1mA, C_{OUT}=1\mu F, f_{RIPPLE} = 1KHZ$  | -     | -60  | -     | dB |
|                         |                    | $I_O=1mA, C_{OUT}=1\mu F, f_{RIPPLE} = 10KHZ$ | -     | -40  | -     |    |

**Regulator2**

|                         |            |                              |       |     |       |   |
|-------------------------|------------|------------------------------|-------|-----|-------|---|
| Output Voltage Accuracy | $V_{OUT2}$ | $I_{OUT2}=1mA$ (APE8843MP-A) | 1.176 | 1.2 | 1.224 | V |
|                         |            | $I_{OUT2}=1mA$ (APE8843MP-B) | 1.176 | 1.2 | 1.224 |   |
|                         |            | $I_{OUT2}=1mA$ (APE8843MP-C) | 1.078 | 1.1 | 1.122 |   |



**PIN DESCRIPTIONS**

| Parameter               | SYM                | TEST CONDITION                                      | MIN | TYP | MAX | UNITS   |
|-------------------------|--------------------|---|-----|-----|-----|---------|
| Dropout Voltage (Note1) | $V_{DRO2}$         | $V_O=1.2V$ guarantee by $V_{IN} \geq 3.2V$          |     |     |     |         |
| Quiescent Current       | $I_{Q2}$           | $I_O=0mA$   | -   | 30  | 55  | $\mu A$ |
| Line Regulation         | $V_{Line2}$        | $I_O=1mA$ , $V_{IN}$ test condition to 6V           | -   | 1   | 5   | mV      |
| Load Regulation (Note2) | $\Delta V_{LOAD2}$ | $I_O=0mA$ to 600mA                                  | -   | 50  | 100 | mV      |
| Current Limit           | $I_{LIMIT2}$       | $R_{Load}=1\Omega$                                  | 600 | 650 | -   | mA      |
| Ripple Rejection        | PSRR2              | $I_O=1mA$ , $C_{OUT}=1\mu F$ , $f_{RIPPLE} = 1KHZ$  | -   | -60 | -   | dB      |
|                         |                    | $I_O=1mA$ , $C_{OUT}=1\mu F$ , $f_{RIPPLE} = 10KHZ$ | -   | -40 | -   |         |

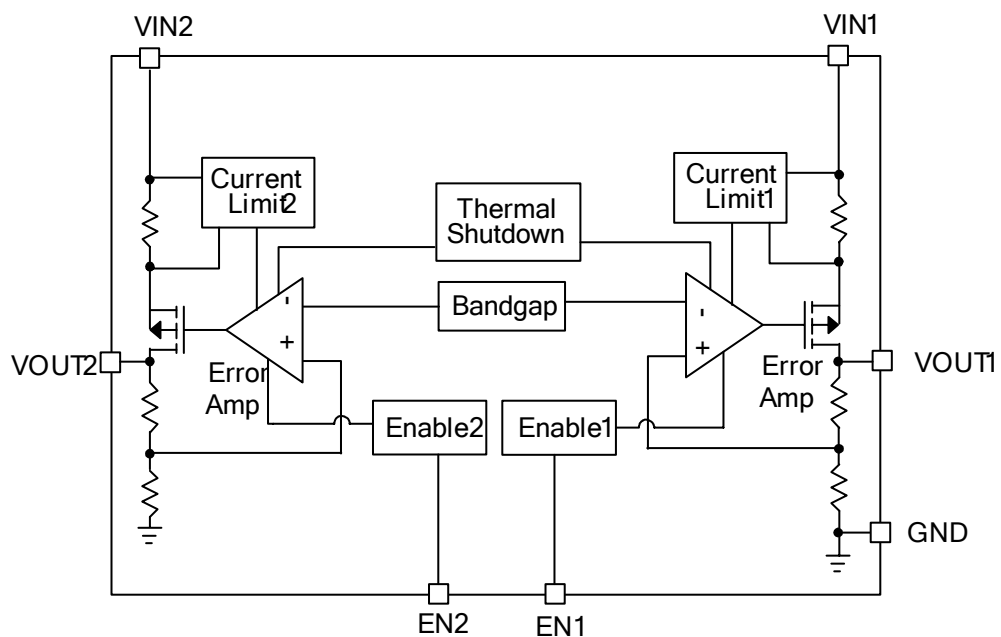
Note 1 : The dropout voltage is defined as  $V_{IN}-V_{OUT}$ , which is measured when  $V_{OUT}$  drop about 100mV.

Note 2 : Regulation is measured at a constant junction temperature by using 30ms current pulse and load regulation in the load range from 0mA to 600mA.

**PIN DESCRIPTIONS**

| PIN SYMBOL | PIN DESCRIPTION                |
|------------|--------------------------------|
| GND        | Common Ground                  |
| EN1        | Channel 1 Shutdown Control Pin |
| EN2        | Channel 2 Shutdown Control Pin |
| VOUT1      | Channel1 Output Voltage        |
| VOUT2      | Channel2 Output Voltage        |
| VIN1       | Channel1 input Voltage         |
| VIN2       | Channel2 input Voltage         |

**BLOCK DIAGRAM**





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**MARKING INFORMATION**

ESOP-8

