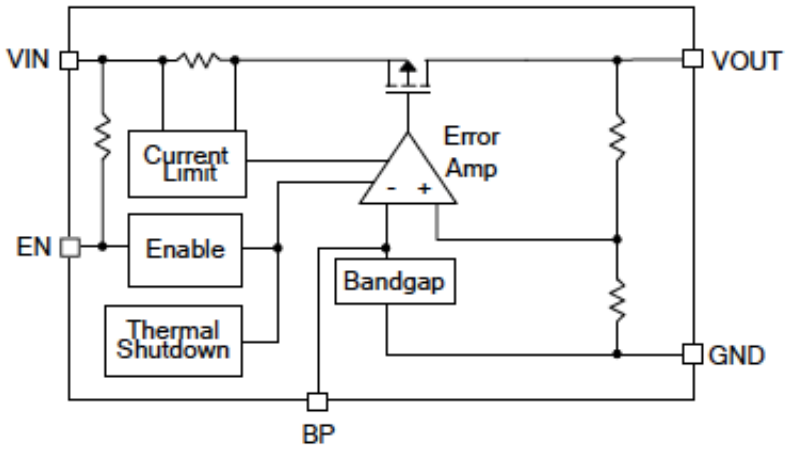
## Electrical Characteristics (Ta = 25°C, unless otherwise noted)

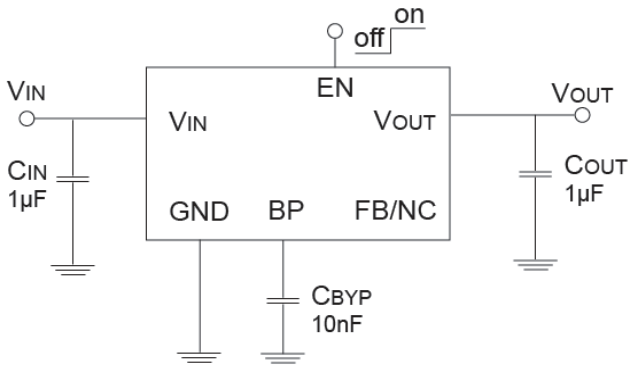
| Parameter | Symbol | Test Condition | | Min | Typ | Max | Units |
|---|---|---|---|---|---|---|---|
| Input Voltage | $V_{IN}$ | (Note 1) | | 2.5 | -- | 5.5 | V |
| Output Voltage Accuracy | $\Delta V_{OUT}$ | $I_{OUT}$ =1mA | | -2 | -- | +2 | % |
| Dropout Voltage | $V_{DROP}$ | $I_O$ =600mA, $V_O$ =$V_{O(NOM)}$ -2% | 1.5V ≤ $V_{OUT}$ ≤ 2V | -- | 1000 | 1200 | mV |
| | | | 2.8V ≤ $V_{OUT}$ ≤ 5V | -- | 350 | 500 | |
| Current Limit | $I_{LIMIT}$ | $R_{LOAD}$=1Ω | | 700 | -- | -- | mA |
| Short Circuit Current | $I_{SHORT}$ | $V_{OUT}$ <0.375 x $V_{OUT}$ | | -- | 300 | -- | mA |
| Line Regulation | $REG_{LINE}$ | $I_{OUT}$ =1mA , $V_{IN}$= $V_{OUT}$ +1V ~ 5V | | -- | 0.2 | 0.5 | % |
| Load Regulation | $REG_{LOAD}$ | $I_{OUT}$ =10~600mA | | -- | 0.5 | 1 | % |
| Power Supply Rejection | PSRR | $C_{IN}$=1uF, $C_{OUT}$=1uF, $I_{OUT}$=10mA | f=120Hz. | -- | 65 | -- | dB |
| | | | f=1kHz. | -- | 55 | -- | |
| Quiescent Current | $I_Q$ | $I_{OUT}$ 0mA | | -- | 50 | 80 | uA |
| Shutdown Current | $I_{SD}$ | $V_{IN}$= 2.8V~5V, $V_{EN}$ =0V | | -- | -- | 1 | uA |
| Enable Pin Current | $I_{ENH}$ | $V_{EH}$ =$V_{IN}$ | | -- | -- | 0.1 | uA |
| | $I_{ENL}$ | $V_{IN}$ =3.6V, $V_{EN}$ =0V | | | | 1 | |
| EN Input Threshold | $V_{ENH}$ | | | 1.5 | -- | -- | V |
| | $V_{ENL}$ | | | -- | -- | 0.4 | V |
| Over Temp. Shutdown | OTS | | | -- | 140 | -- | °C |
| Over Temp. Hysterisis | OTH | | | -- | 30 | -- | °C |

Note1: $V_{IN(MIN)}$=$V_{OUT}$+$V_{DROPOUT}$
Note2: The is $V_{DROPOUT}$ defined as $V_{IN}$-$V_{OUT}$, which is measured when $V_{OUT}$ drop about 100mV
Note3: Regulation is measured at constant junction temperature by using pulsed testing with a low ON tim

## Block Diagram




## Typical Application Circuit




## Application Information

TS9005 is specifically designed for portable applications requiring minimum board space and smallest components. It can provide 600mA output current at dropout voltage about 600mV. Beside, current limit and thermal shutdown features provide protection against any combination of overload or ambient temperature that could exceed junction temperature.

### Capacitor Selection

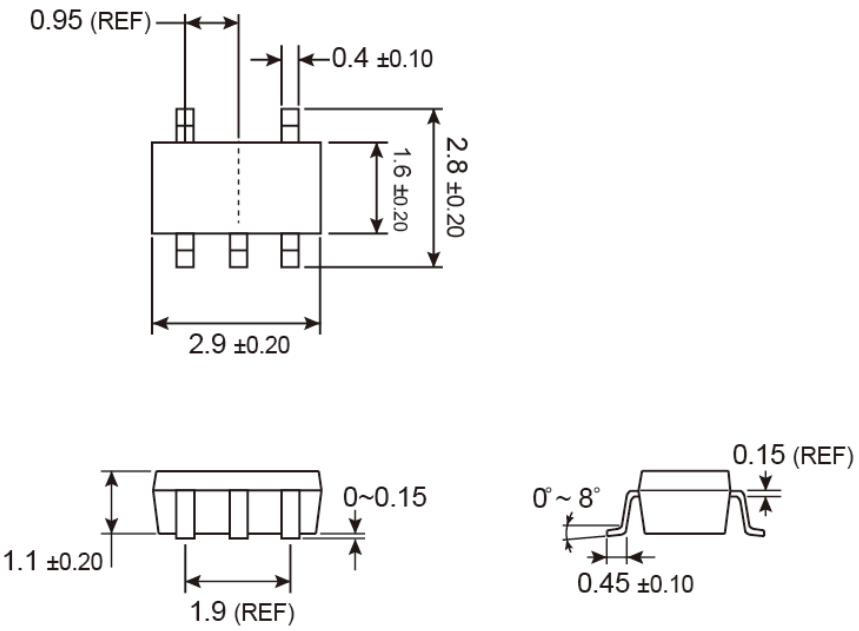
TS9005 is designed to be stable with a wide range of output capacitors. The ESR of the output capacitor affects stability. Larger output capacitor value can decrease peak deviations and to improve transition response for larger current changes. So the ESR of output capacitor is very important because it generates a zero to provide phase lead for loop stability. There is no requirement for the ESR on the input capacitor, but voltage and temperature coefficient have to be considered for device application environments.

The capacitor types (aluminum, ceramic and tantalum) have difference characterizations such as temperature and voltage coefficients. All ceramic capacitors are produces with a variety of dielectrics, each with different behavior across temperature and applications. Common dielectric use are X5R, X7R and Y5V. It is recommended to use 1uF X5R or X7R dielectric ceramic capacitor with 30mΩ~50mΩ ESR range between device outputs to ground for transient stability.

### Current Limit and Thermal Shutdown Protection

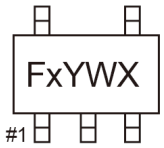
In order to prevent overloading or thermal condition from damaging the device, TS9005 regulator has internal thermal and current limiting functions designed to protect the device. It will rapidly shut off PMOS pass element during overloading or over temperature condition.

## SOT-25 Mechanical Drawing




Unit: Millimeters

## Marking Diagram




**F** = Device Code
**x** = Voltage Code
**k**=1.8V, **s**=3.3V
**Y** = Year Code (3=2013, 4=2014……)
**W** = Week Code
WW: 01~26 (A~Z)
27~52 (a~z)
**X** = Internal ID Code

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