■ INTRODUCTION

The CE6275 series is a set of three-terminal low power high voltage regulator implemented in CMOS technology. They can deliver 150mA output current and allow an input voltage as high as 30V. They are available with several fixed output voltages ranging from 2.8V to 5V. CMOS technology ensures low voltage drop and low quiescent current.

Although designed primarily as fixed voltage regulators, these devices can be used with external components to obtain variable voltages and currents.

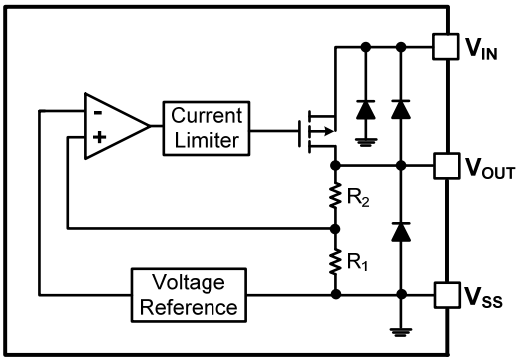
■ FEATURES

- Low Power Consumption
- Low Voltage Drop
- Output Voltage Range: 2.8V ~ 5V
- Low Temperature Coefficient
- High Input Voltage (up to 30V)
- Quiescent current: 2.5μA
- High Output Current :150mA(Typ.)
- Output Voltage Accuracy: ±2%
- Ceramic Capacitor Compatible
- SOT23-3/5, SOT89-3 and TO-92 Packages

■ APPLICATIONS

- Battery-powered Equipment
- Audio/Video Equipment
- Portable Consumer Equipment
- Communication Equipment

■ BLOCK DIAGRAM



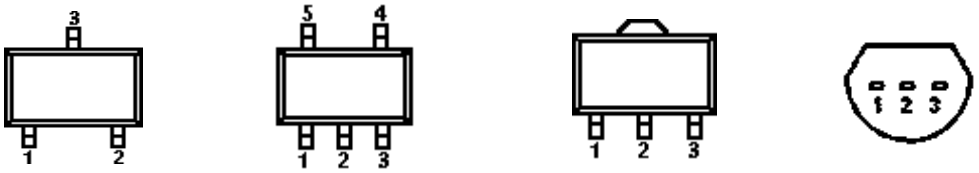
■ ORDER INFORMATION

CE6275①②③④

DESIGNATOR	SYMBOL	DESCRIPITION
①	A	Standard
②③	Integer	Output Voltage(2.8~5V) e.g:3.0V=②:3,③:0
④	M/MC/MY	Package:SOT23-3
	MR	Package:SOT23-5
	P	Package:SOT89-3
	T	Package:TO-92

■ PIN CONFIGURATION（Pin output sequence can be ordered by customer）

SOT23-3 SOT23-5 SOT89-3 TO-92



PIN NUMBER						PIN NAME	FUNCTION
SOT23-3			SOT89-3		TO-92		
M	MC	MY	P	PT	T		
1	3	3	1	2	1	V_{SS}	Ground
2	2	1	3	1	3	V_{OUT}	Output
3	1	2	2	3	2	V_{IN}	Power input

SOT23-5(MR)

PIN NUMBER	PIN NAME	FUNCTION
1	V_{SS}	Ground
2	V_{IN}	Power Input Pin
3	V_{OUT}	Output Pin
4,5	NC	No Connection

■ Absolute Maximum Ratings(1)

(Unless otherwise specified, T_A=25°C)

PARAMETER	SYMBOL	RATINGS	UNITS
Input Voltage(2)	V_{IN}	-0.3~33	V
Output Voltage(2)	V_{OUT}	-0.3~10	V
Operating free air temperature range	T_A	-40~85	°C
Operating Junction TemperatureRange	T_j	-40~125	°C
Storage Temperature	T_{stg}	-40~125	°C
Lead Temperature(Soldering, 10 sec)	T_{solder}	260	°C

(1) Stresses beyond those listed under absolute maximum ratings may cause permanent damage to the device. These are stress ratingsonly, and functional operation of the device at these or any other conditions beyond those indicated in the specificationis not implied. Exposure to absolute-maximum-rated conditions for extended periods my affect device reliability.

(2)All voltages are with respect to network ground terminal.

■ Thermal Information

PARAMETER	SYMBOL	PACKAGE	MAX.	UNIT
Thermal Resistance (Junction to Ambient) (Assume no ambient airflow, no heatsink)	θ_{JA}	SOT23-3/5	500	°C/W
		SOT89-3	200	°C/W
		TO-92	200	°C/W
Power Dissipation	P_D	SOT23-3/5	0.20	W
		SOT89-3	0.50	W
		TO-92	0.50	W

(1) P_D is measured at T_A=25°C

■ Electrical Characteristics

CE6275A30+3.0V Output Type (Unless otherwise specified：T_A=25°C)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Input Voltage	V_{IN}	—	—	—	30	V
Output Voltage	V_{OUT}	V_{IN}=5.0V, I_{OUT}=10mA	2.940	3.000	3.060	V
Output Current	I_{OUT}	V_{IN}=5.0V	70	100	—	mA
Load Regulation	ΔV_{OUT}	V_{IN}=5.0V, 1mA≤I_{OUT}≤50mA		5	25	mV
Dropout Voltage(1)	V_{DIF}	I_{OUT}=1mA,△V_{OUT}=2%	—	10	30	mV
Quiescent Current	I_{SS}	V_{IN}=5.0V, No load		2.5	4.0	μA
Line Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	4.0V≤V_{IN}≤30V, I_{OUT}=1mA	—	0.1	0.2	%/V
Temperature Coefficient	$\frac{\Delta V_{OUT}}{\Delta T_A}$	I_{OUT}=10mA, -40°C<T_A<85°C		±0.45		mV/°C
Short Current	I_{SHORT}	V_{OUT} = V_{SS}		10		mA

(1) Dropout voltage is defined as the input voltage minus the output voltage that produces a 2% change in theoutput voltage from the value at V_{IN} = V_{OUT}+2V with a fixed load.

CE6275A33+3.3V Output Type (Unless otherwise specified：T_A=25°C)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Input Voltage	V_{IN}	—	—	—	30	V
Output Voltage	V_{OUT}	V_{IN}=5.3V, I_{OUT}=10mA	3.234	3.300	3.366	V
Output Current	I_{OUT}	V_{IN}=5.3V	100	150	—	mA
Load Regulation	ΔV_{OUT}	V_{IN}=5.3V, 1mA≤I_{OUT}≤50mA		5	25	mV
Dropout Voltage(1)	V_{DIF}	I_{OUT}=1mA,ΔV_{OUT}=2%	—	10	30	mV
Quiescent Current	I_{SS}	V_{IN}=5.3V, No load		2.5	4.0	μA
Line Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	4.3V≤V_{IN}≤30V, I_{OUT}=1mA	—	0.1	0.2	%/V
Temperature Coefficient	$\frac{\Delta V_{OUT}}{\Delta T_A}$	I_{OUT}=10mA, -40°C<T_A<85°C		±0.5		mV/°C
Short Current	I_{SHORT}	V_{OUT} = V_{SS}		10		mA

(1) Dropout voltage is defined as the input voltage minus the output voltage that produces a 2% change in theoutput voltage from the value at V_{IN} = V_{OUT}+2V with a fixed load.

■ Electrical Characteristics(continued)

CE6275A36+3.6V Output Type (Unless otherwise specified：T_A=25°C)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Input Voltage	V_{IN}	—	—	—	30	V
Output Voltage	V_{OUT}	V_{IN}=5.6V, I_{OUT}=10mA	3.528	3.600	3.672	V
Output Current	I_{OUT}	V_{IN}=5.6V	100	150	—	mA
Load Regulation	ΔV_{OUT}	V_{IN}=5.6V, 1mA≤I_{OUT}≤50mA		5	25	mV
Dropout Voltage(1)	V_{DIF}	I_{OUT}=1mA,ΔV_{OUT}=2%	—	10	30	mV
Quiescent Current	I_{SS}	V_{IN}=5.6V, No load		2.5	4.0	μA
Line Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	4.6V≤V_{IN}≤30V, I_{OUT}=1mA	—	0.1	0.2	%/V
Temperature Coefficient	$\frac{\Delta V_{OUT}}{\Delta T_A}$	I_{OUT}=10mA, -40°C<T_A<85°C		±0.6		mV/°C
Short Current	I_{SHORT}	V_{OUT} = V_{SS}		10		mA

(1) Dropout voltage is defined as the input voltage minus the output voltage that produces a 2% change in theoutput voltage from the value at V_{IN} = V_{OUT}+2V with a fixed load.

CE6275A40+4.0V Output Type (Unless otherwise specified：T_A=25°C)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Input Voltage	V_{IN}	—	—	—	30	V
Output Voltage	V_{OUT}	V_{IN}=6.0V, I_{OUT}=10mA	3.920	4.000	4.080	V
Output Current	I_{OUT}	V_{IN}=6.0V	100	150	—	mA
Load Regulation	ΔV_{OUT}	V_{IN}=6.0V, 1mA≤I_{OUT}≤50mA		5	25	mV
Dropout Voltage(1)	V_{DIF}	I_{OUT}=1mA,ΔV_{OUT}=2%	—	10	30	mV
Quiescent Current	I_{SS}	V_{IN}=6.0V, No load		2.5	4.0	μA
Line Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	5.0V≤V_{IN}≤30V, I_{OUT}=1mA	—	0.1	0.2	%/V
Temperature Coefficient	$\frac{\Delta V_{OUT}}{\Delta T_A}$	I_{OUT}=10mA, -40°C<T_A<85°C		±0.7		mV/°C
Short Current	I_{SHORT}	V_{OUT} = V_{SS}		10		mA

(1) Dropout voltage is defined as the input voltage minus the output voltage that produces a 2% change in theoutput voltage from the value at V_{IN} = V_{OUT}+2V with a fixed load.

■ Electrical Characteristics(continued)

CE6275A44+4.4V Output Type (Unless otherwise specified：T_A=25°C)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Input Voltage	V_{IN}	—	—	—	30	V
Output Voltage	V_{OUT}	V_{IN}=6.4V, I_{OUT}=10mA	4.312	4.400	4.488	V
Output Current	I_{OUT}	V_{IN}=6.4V	100	150	—	mA
Load Regulation	ΔV_{OUT}	V_{IN}=6.4V, 1mA≤I_{OUT}≤50mA		5	25	mV
Dropout Voltage(1)	V_{DIF}	I_{OUT}=1mA,ΔV_{OUT}=2%	—	10	30	mV
Quiescent Current	I_{SS}	V_{IN}=6.4V, No load		2.5	4.0	μA
Line Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	5.4V≤V_{IN}≤30V, I_{OUT}=1mA	—	0.1	0.2	%/V
Temperature Coefficient	$\frac{\Delta V_{OUT}}{\Delta T_A}$	I_{OUT}=10mA, -40°C<T_A<85°C		±0.7		mV/°C
Short Current	I_{SHORT}	V_{OUT} = V_{SS}		10		mA

(1) Dropout voltage is defined as the input voltage minus the output voltage that produces a 2% change in theoutput voltage from the value at V_{IN} = V_{OUT}+2V with a fixed load.

CE6275A50+5.0V Output Type (Unless otherwise specified：T_A=25°C)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Input Voltage	V_{IN}	—	—	—	30	V
Output Voltage	V_{OUT}	V_{IN}=7V, I_{OUT}=10mA	4.900	5.000	5.100	V
Output Current	I_{OUT}	V_{IN}=7V	100	150	—	mA
Load Regulation	ΔV_{OUT}	V_{IN}=7V, 1mA≤I_{OUT}≤50mA		5	25	mV
Dropout Voltage(1)	V_{DIF}	I_{OUT}=1mA,ΔV_{OUT}=2%	—	10	30	mV
Quiescent Current	I_{SS}	V_{IN}=7V, No load		2.5	4.0	μA
Line Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	6.0V≤V_{IN}≤30V, I_{OUT}=1mA	—	0.1	0.2	%/V
Temperature Coefficient	$\frac{\Delta V_{OUT}}{\Delta T_A}$	I_{OUT}=10mA, -40°C<T_A<85°C		±0.75		mV/°C
Short Current	I_{SHORT}	V_{OUT} = V_{SS}		10		mA

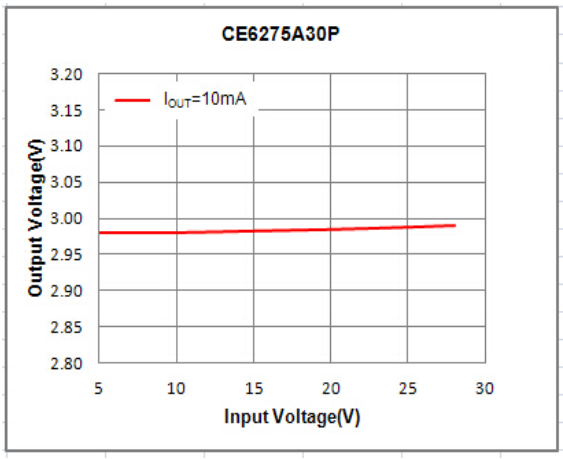
(1) Dropout voltage is defined as the input voltage minus the output voltage that produces a 2% change in theoutput voltage from the value at V_{IN} = V_{OUT}+2V with a fixed load.

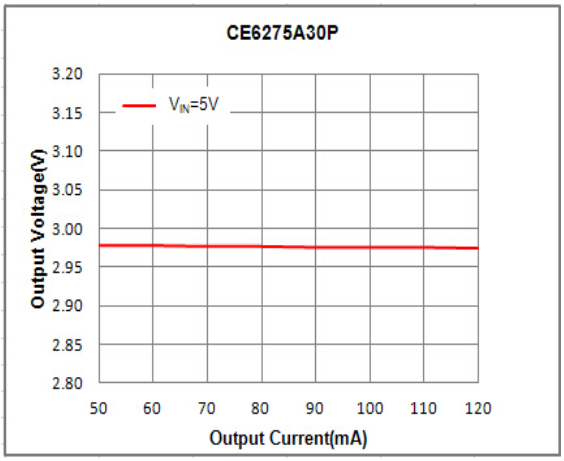
■ Typical Performance Characteristics

Test Condition: V_{IN}=V_{OUT}+2V, T_A=25°C, unless otherwise specified

CE6275A30P Typ

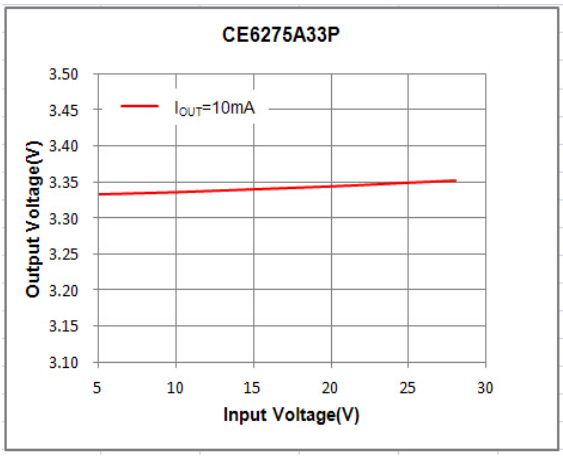
Output Voltage Vs. Input VoltageOutput Voltage Vs. Output Current

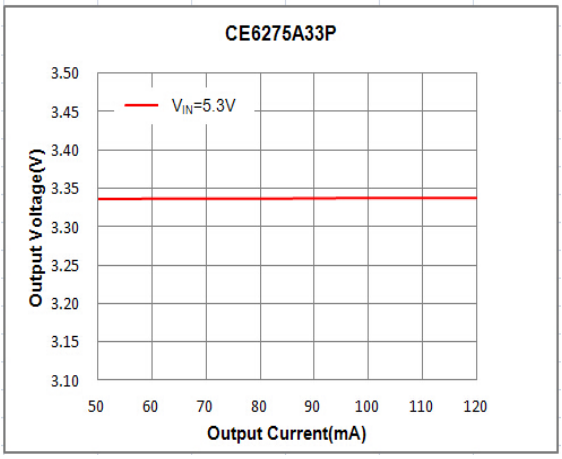




CE6275A33P Typ

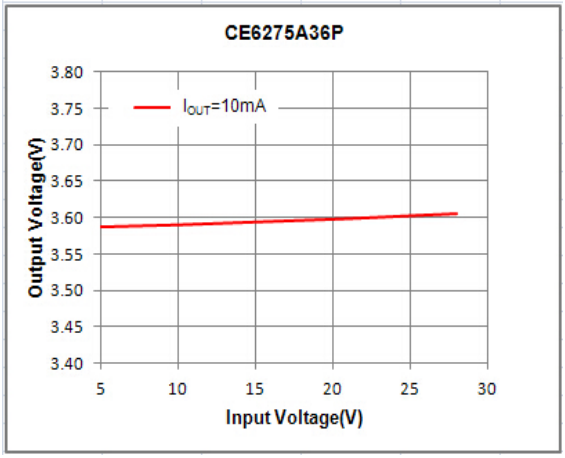
Output Voltage Vs. Input VoltageOutput Voltage Vs. Output Current

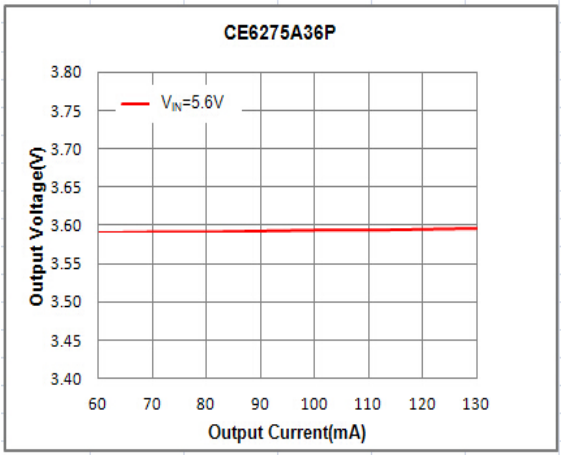




CE6275A36P Typ

Output Voltage Vs. Input VoltageOutput Voltage Vs. Output Current



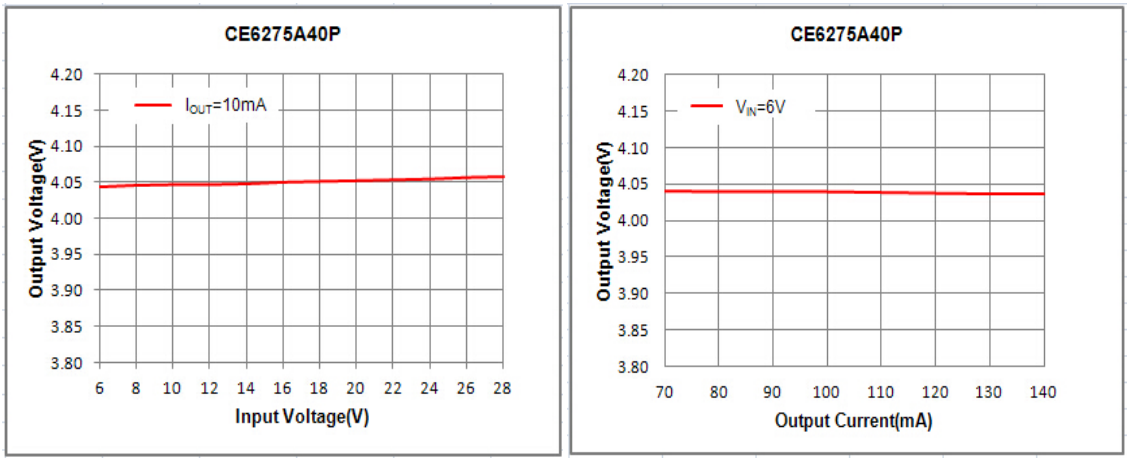


■ Typical Performance Characteristics(continued)

Test Condition: V_{IN}=V_{OUT}+2V, T_A=25°C, unless otherwise specified

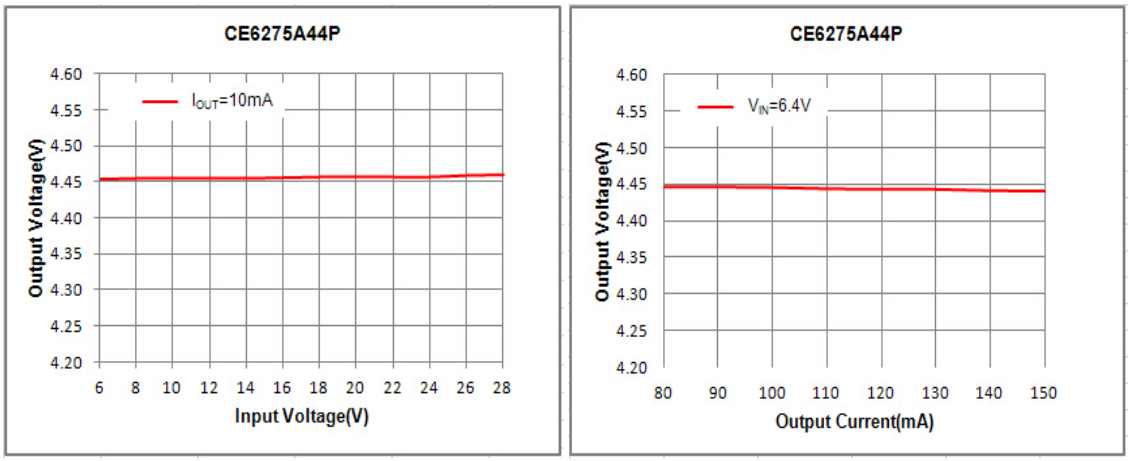
CE6275A40P Typ

Output Voltage Vs. Input VoltageOutput Voltage Vs. Output Current



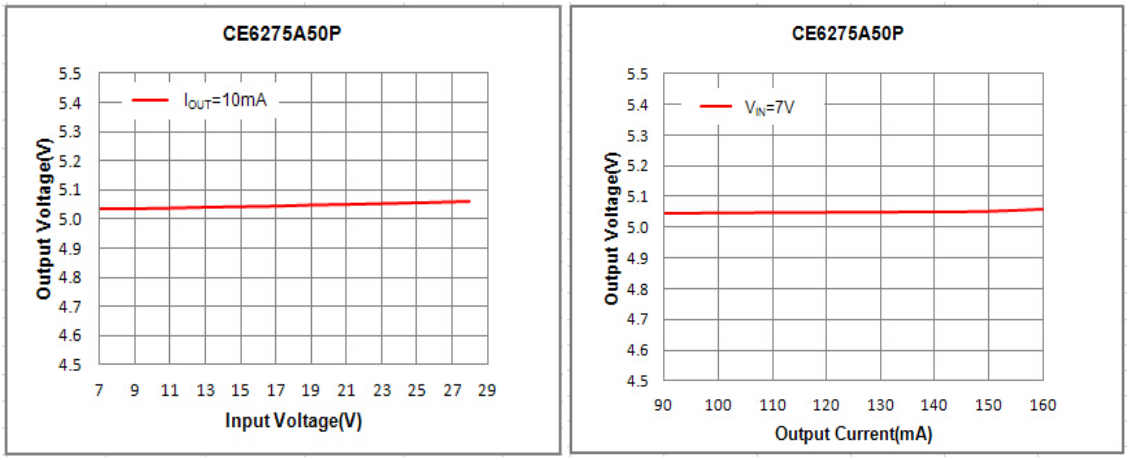
CE6275A44P Typ

Output Voltage Vs. Input VoltageOutput Voltage Vs. Output Current



CE6275A50P Typ

Output Voltage Vs. Input VoltageOutput Voltage Vs. Output Current

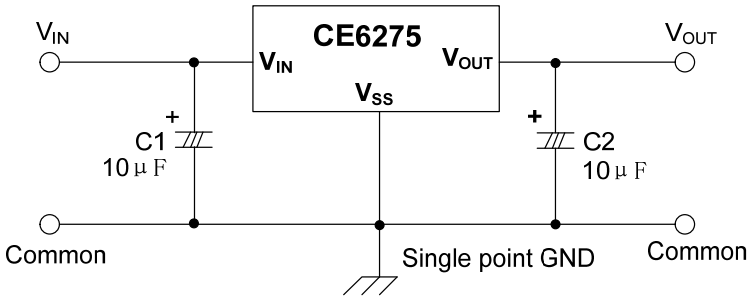


■ Application Circuits

The circuits provided in this section are for reference only.

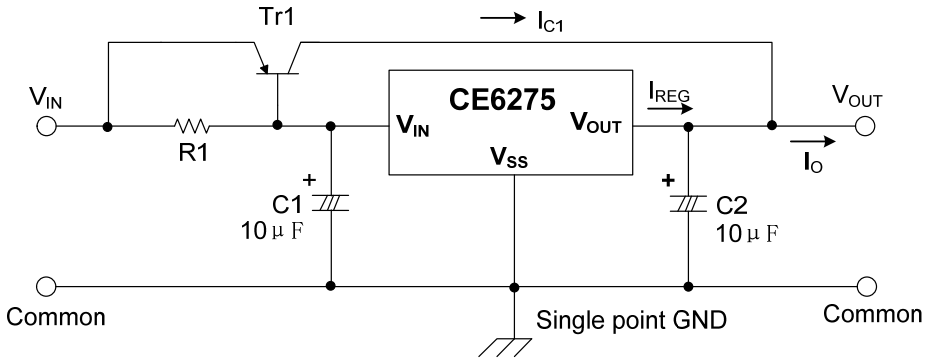
For the purposes of clarity some of the detailed components parameters shall depend on the application.

1. Basic Circuit



Typical Application Circuits

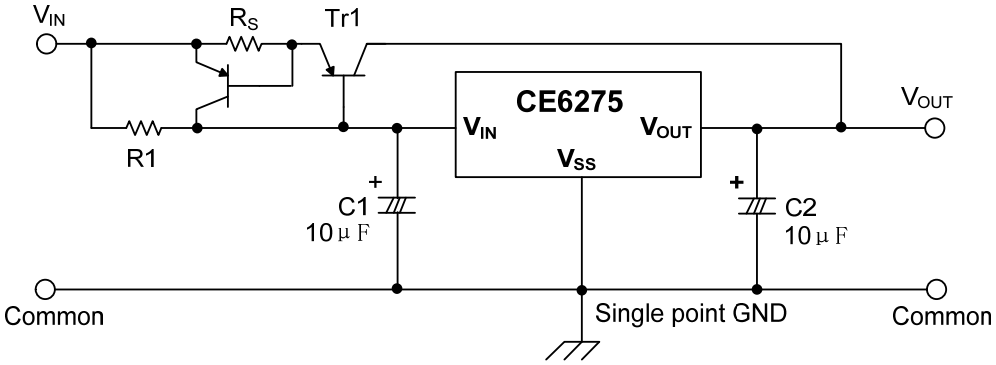
2. High Output Current Positive Voltage Regulator



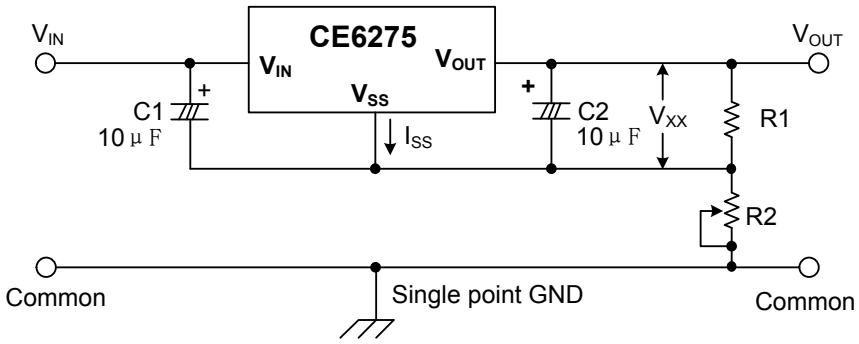
$$R_1 = \frac{V_{BE1}}{I_{REG} - \frac{I_{C1}}{(1+\beta)}}$$

$$I_O = I_{C1} + I_{REG}$$

3. Short-Circuit Protection for Tr1

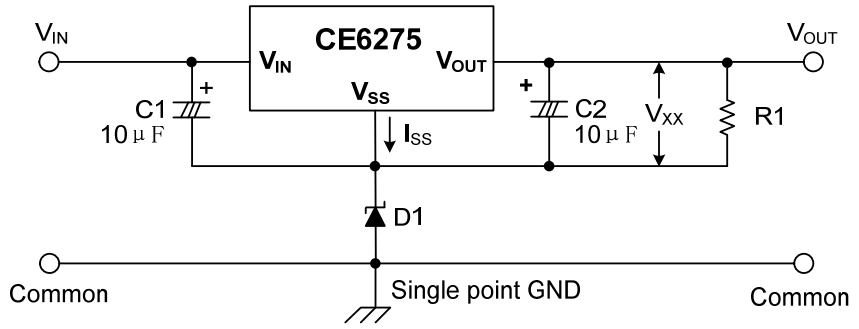


4. Circuit for Increasing Output Voltage



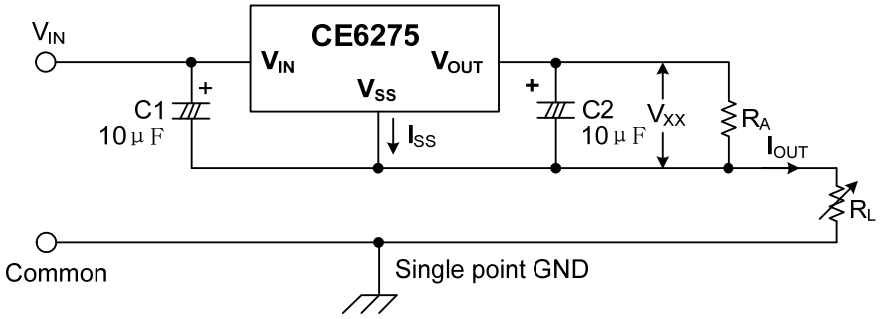
$$V_{OUT} = V_{XX}\left(1 + \frac{R2}{R1}\right) + I_{SS}R2$$

5. Circuit for Increasing Output Voltage



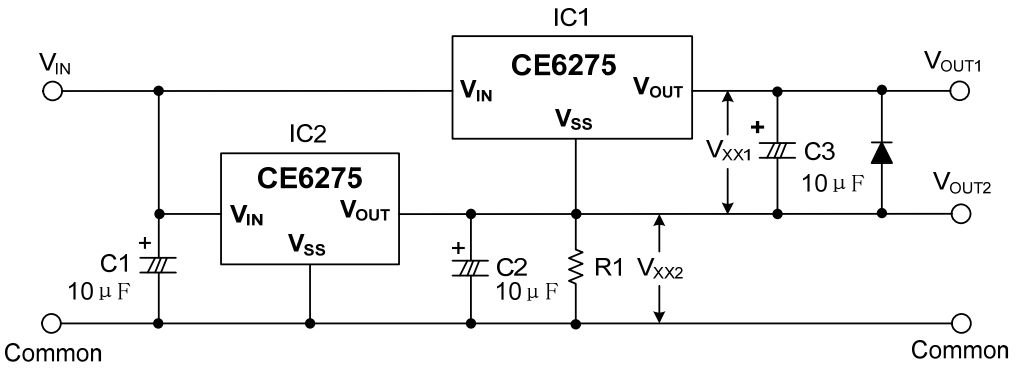
$$V_{OUT}=V_{XX}+V_{D1}$$

6. Constant Current Regulator



$$I_{OUT} = \frac{V_{XX}}{R_A} + I_{SS}$$

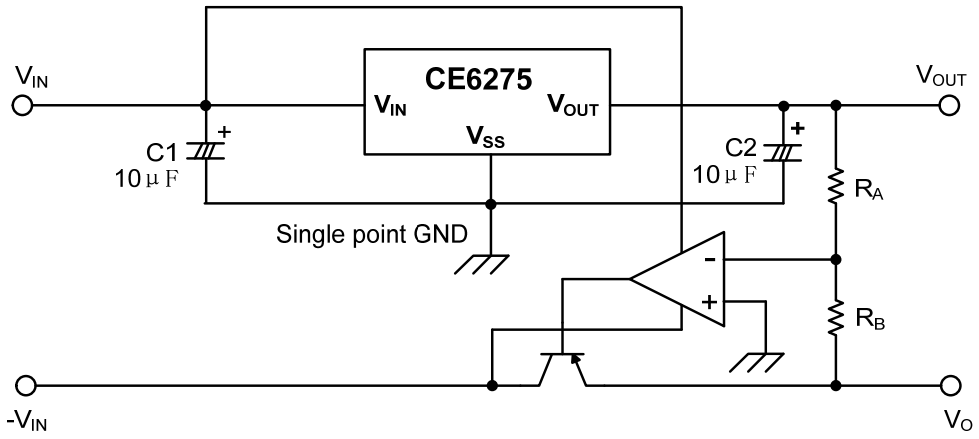
7. Dual Supply



$V_{OUT1}=V_{XX2}+V_{XX1}$

$V_{OUT2}=V_{XX2}$

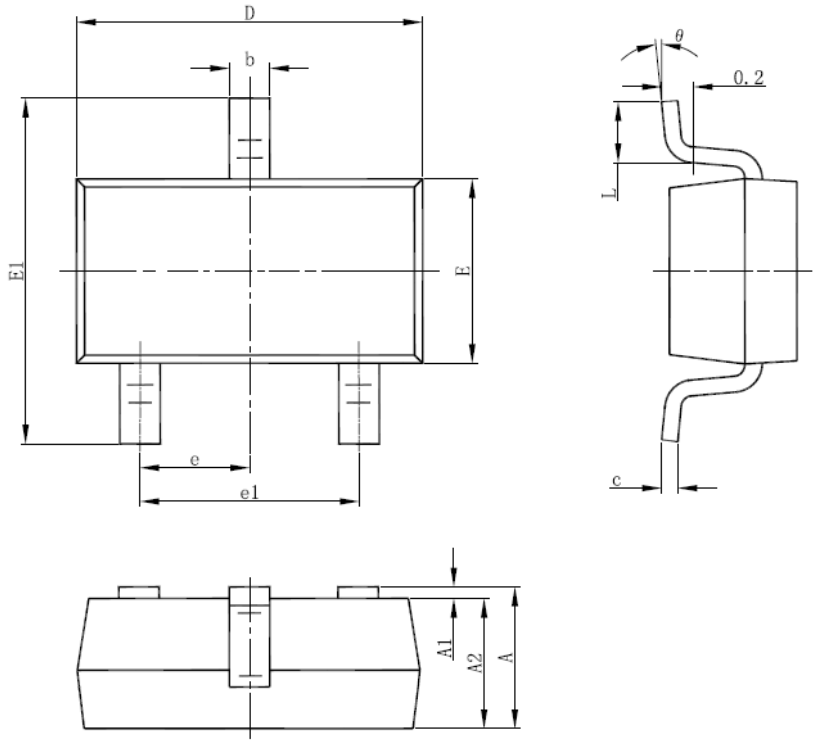
8. Tracking Voltage Regulator



$$-V_O = V_{OUT} \times \frac{R_B}{R_A}$$

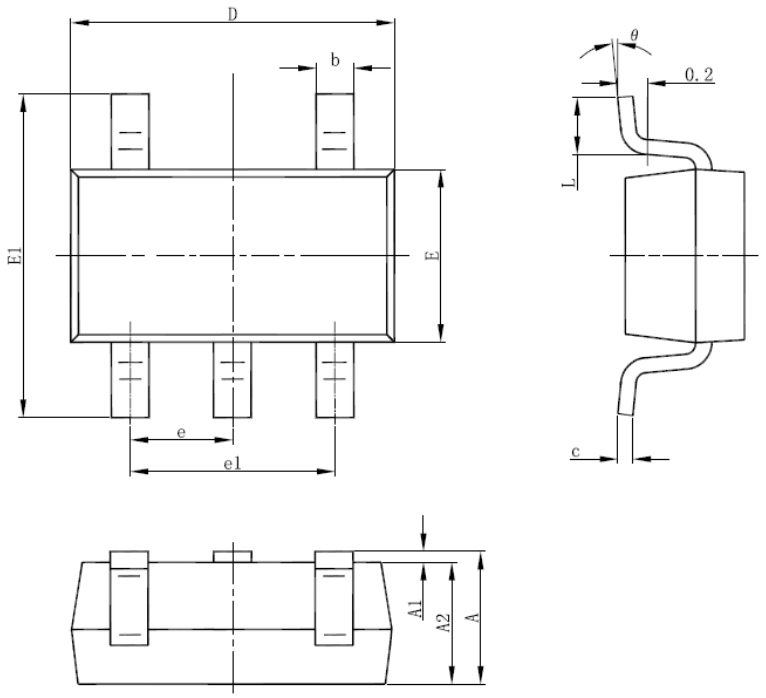
■ PACKAGE INFORMATION

• SOT23-3 PACKAGE OUTLINE DIMENSIONS



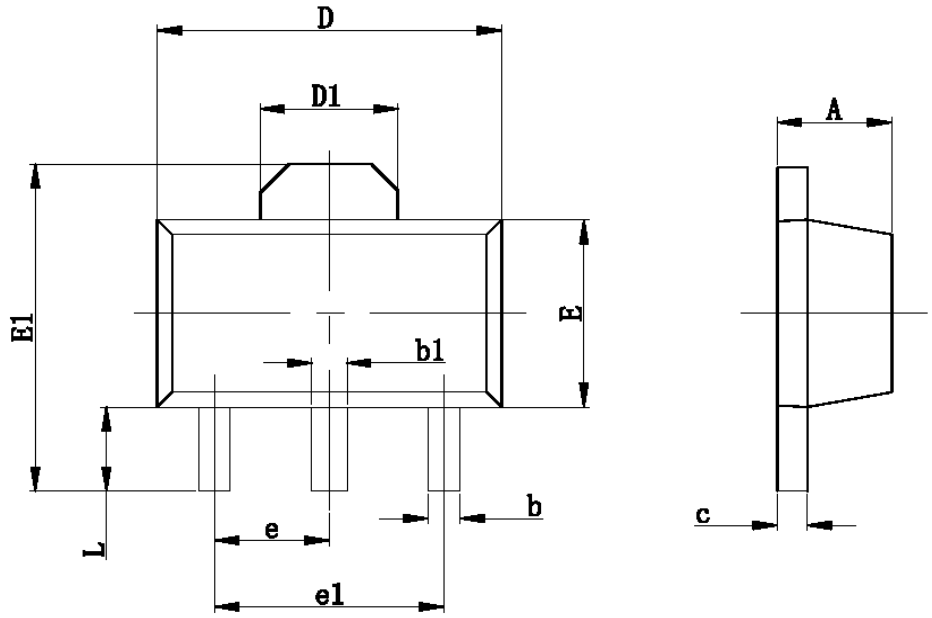
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

● SOT23-5 PACKAGE OUTLINE DIMENSIONS



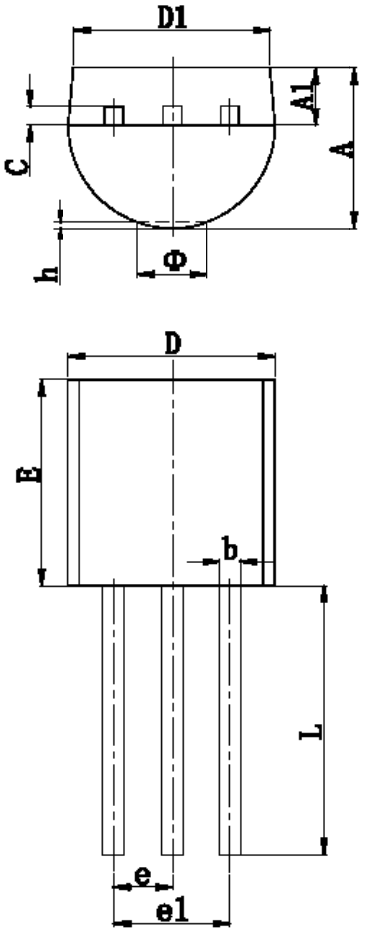
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

• SOT89-3 PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.400	1.600	0.055	0.063
b	0.320	0.520	0.013	0.197
b1	0.400	0.580	0.016	0.023
c	0.350	0.440	0.014	0.017
D	4.400	4.600	0.173	0.181
D1	1.550 REF		0.061 REF	
E	2.300	2.600	0.091	0.102
E1	3.940	4.250	0.155	0.167
e	1.500 TYP		0.060 TYP	
e1	3.000 TYP		0.118 TYP	
L	0.900	1.200	0.035	0.047

● TO-92 PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	3.300	3.700	0.130	0.146
A1	1.100	1.400	0.043	0.055
b	0.380	0.550	0.015	0.022
c	0.360	0.510	0.014	0.020
D	4.400	4.700	0.173	0.185
D1	3.430		0.135	
E	4.300	1.400	0.169	0.185
e	1.270 TYP		0.050 TYP	
e1	2.440	2.640	0.096	0.104
L	14.100	14.500	0.555	0.571
Φ		1.600		0.063
h	0.000	0.380	0.000	0.015