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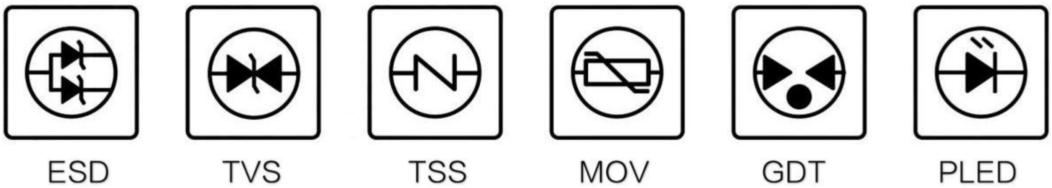


TLV70XXXDBVR(MS)

Product specification

TLV70XXXDBVR(MS) LOW DROPOUT LINEAR REGULATOR

GENERAL DESCRIPTION

TLV70XXXDBVR(MS) series are a set of Low Dropout LinearRegulator ICs implemented in CMOS technology.They can withstand voltage 30V. And they areavailable with low voltage drop and low quiescentcurrent, widely used in audio, video and communication appliances.

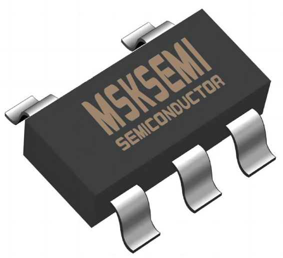
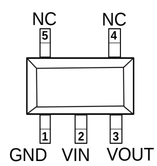
FEATURES

- Low Power Consumption
- Low Voltage Drop
- Low Temperature Coefficient
- Withstanding Voltage 30V
- Quiescent Current 1.5μA
- Output Voltage Accuracy: tolerance ±2%
- High output current: 100mA

TYPICAL APPLICATIONS

- Battery-powered Equipments
- Communication Equipments
- Audio/Video Equipments

Reference News

PACKAGE OUTLINE	PIN CONFIGURATION
	
SOT-23-5	

PIN DESCRIPTION

No.	Name	Functions Description
1	GND	ground
2	V_{IN}	input
3	V_{OUT}	output

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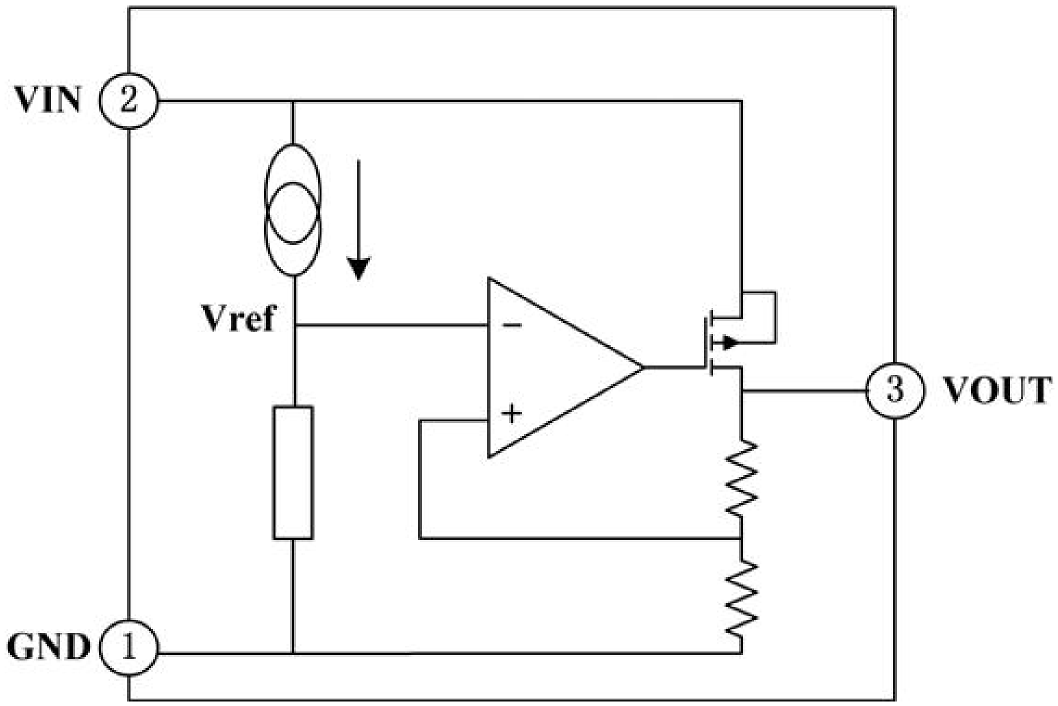
OUTPUT

Series	Marking	Output	Package
TLV70425	|425	2.5V	SOT-23-5
TLV70428	|428	2.8V	
TLV70430	|QUQ	3.0V	
TLV70433	|PAO	3.3V	
TLV70436	|436	3.6V	
TLV70440	|440	4.0V	
TLV70444	|444	4.4V	
TLV70450	|PAX	5.0V	

FUNCTIONALBLOCKDIAGRAM



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ABSOLUTE MAXIMUM RATINGS

Description	Symbol	Value range	Unit
Limit Power Voltage	V_{IN}	−0.3～+33	V
Storage Temperature Range	T_{STG}	−50～+125	℃
Operating Free-air Temperature Range	T_A	−40～+85	℃

Note：Stresses greater than those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under "Recommended Operating Conditions" is not implied. Exposure to "Absolute Maximum Ratings" for extended periods may affect device reliability.

HEAT DISSIPATION

Description	Symbol	Value range Unit
Thermal resistance	θ_{JA}	500 ℃/W
Power dissipation	P_W	200 mW

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DC CHARACTERISTICS (unless otherwise noted T_A =±25°C)

TLV70425DBVR(MS)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Output Voltage	V_{OUT}	$V_{IN}=V_{OUT}+2.0V$, $I_{OUT}=10mA$	2.45	2.50	2.55	V
Output Current	I_{OUT}	$V_{IN}=V_{OUT}+2.0V$	70	100	—	mA
Load Regulation	ΔV_{OUT}	$V_{IN}=V_{OUT}+2.0V$ $1mA \le I_{OUT} \le 50mA$	—	25	60	mV
Voltage Drop	V_{DIF}	$I_{OUT}=1mA$, $\Delta V_{OUT}=2\%$	—	30	100	mV
Quiescent Current	I_{SS}	No Load	—	1.5	3.0	μA
Line Regulation	$\Delta V_{OUT}/V_{OUT}*\Delta V_{IN}$	$V_{OUT}+1.0V \le V_{IN} \le 30V$, $I_{OUT}=1mA$	—	—	0.2	%/V
Input Voltage	V_{IN}	—	—	—	30	V
Temperature Coefficient	$\Delta V_{OUT}/\Delta T_A*V_{OUT}$	$V_{OUT}+2.0V$, $I_{OUT}=10mA$, $-40°C \le T_A \le 85°C$	—	100	—	ppm/°C

Note： When $V_{IN}=V_{OUT}+2.0V$, as the output voltage declined 2%, the $V_{DIF}=V_{IN}-V_{OUT}$.

TLV70428DBVR(MS)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Output Voltage	V_{OUT}	$V_{IN}=V_{OUT}+2.0V$, $I_{OUT}=10mA$	2.744	2.80	2.856	V
Output Current	I_{OUT}	$V_{IN}=V_{OUT}+2.0V$	70	100	—	mA
Load Regulation	ΔV_{OUT}	$V_{IN}=V_{OUT}+2.0V$ $1mA \le I_{OUT} \le 50mA$	—	25	60	mV
Voltage Drop	V_{DIF}	$I_{OUT}=1mA$, $\Delta V_{OUT}=2\%$	—	30	100	mV
Quiescent Current	I_{SS}	No Load	—	1.5	3.0	μA
Line Regulation	$\Delta V_{OUT}/V_{OUT}*\Delta V_{IN}$	$V_{OUT}+1.0V \le V_{IN} \le 30V$, $I_{OUT}=1mA$	—	—	0.2	%/V
Input Voltage	V_{IN}	—	—	—	30	V
Temperature Coefficient	$\Delta V_{OUT}/\Delta T_A*V_{OUT}$	$V_{OUT}+2.0V$, $I_{OUT}=10mA$, $-40°C \le T_A \le 85°C$	—	100	—	ppm/°C

Note： When $V_{IN}=V_{OUT}+2.0V$, as the output voltage declined 2%, the $V_{DIF}=V_{IN}-V_{OUT}$.

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TLV70430DBVR(MS)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Output Voltage	V_{OUT}	V_{IN}=V_{OUT}+2.0V，I_{OUT}=10mA	2.94	3.00	3.06	V
Output Current	I_{OUT}	V_{IN}=V_{OUT}+2.0V	70	100	—	mA
Load Regulation	△V_{OUT}	V_{IN}=V_{OUT}+2.0V 1mA≤I_{OUT}≤50mA	—	25	60	mV
Voltage Drop	V_{DIF}	I_{OUT}=1mA，△V_{OUT}=2%	—	30	100	mV
Quiescent Current	I_{SS}	No Load	—	1.5	3.0	μA
Line Regulation	△V_{OUT}/ V_{OUT}* △V_{IN}	V_{OUT}+1.0V≤V_{IN}≤30V，I_{OUT}=1mA	—	—	0.2	%/V
Input Voltage	V_{IN}	—	—	—	30	V
Temperature Coefficient	△V_{OUT}/ △T_A*V_{OUT}	V_{IN}= V_{OUT}+2.0V，I_{OUT}=10mA，-40℃≤T_A≤85℃	—	100	—	ppm/℃

Note：When V_{IN}=V_{OUT}+2.0V, as the output voltage declined 2%, the V_{DIF}=V_{IN}-V_{OUT}.

TLV70433DBVR(MS)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Output Voltage	V_{OUT}	V_{IN}=V_{OUT}+2.0V，I_{OUT}=10mA	3.234	3.30	3.366	V
Output Current	I_{OUT}	V_{IN}=V_{OUT}+2.0V	70	100	—	mA
Load Regulation	[illegible]V_{OUT}	V_{IN}=V_{OUT}+2.0V 1mA≤I_{OUT}≤50mA	—	25	60	mV
Voltage Drop	V_{DIF}	I_{OUT}=1mA，△V_{OUT}=2%	—	25	55	mV
Quiescent Current	I_{SS}	No Load	—	1.5	3.0	μA
Line Regulation	△V_{OUT}/ V_{OUT}* △V_{IN}	V_{OUT}+1.0V≤V_{IN}≤30V，I_{OUT}=1mA	—	—	0.2	%/V
Input Voltage	V_{IN}	—	—	—	30	V
Temperature Coefficient	△V_{OUT}/ △T_A*V_{OUT}	V_{IN}= V_{OUT}+2.0V，I_{OUT}=10mA，-40℃≤T_A≤85℃	—	100	—	ppm/℃

Note：When V_{IN}=V_{OUT}+2.0V, as the output voltage declined 2%, the V_{DIF}=V_{IN}-V_{OUT}.

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TLV70436DBVR(MS)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Output Voltage	V_{OUT}	$V_{IN}=V_{OUT}+2.0V$, $I_{OUT}=10mA$	3.528	3.60	3.672	V
Output Current	I_{OUT}	$V_{IN}=V_{OUT}+2.0V$	70	100	—	mA
Load Regulation	$\triangle V_{OUT}$	$V_{IN}=V_{OUT}+2.0V$ $1mA\leq I_{OUT}\leq 50mA$	—	25	60	mV
Voltage Drop	V_{DIF}	$I_{OUT}=1mA$, $\triangle V_{OUT}=2\%$	—	25	55	mV
Quiescent Current	I_{SS}	No Load	—	1.5	3.0	μA
Line Regulation	$\triangle V_{OUT}/V_{OUT}*\triangle V_{IN}$	$V_{OUT}+1.0V\leq V_{IN}\leq 30V$, $I_{OUT}=1mA$	—	—	0.2	%/V
Input Voltage	V_{IN}	—	—	—	30	V
Temperature Coefficient	$\triangle V_{OUT}/\triangle T_A*V_{OUT}$	$V_{IN}=V_{OUT}+2.0V$, $I_{OUT}=10mA$, $-40℃\leq T_A\leq 85℃$	—	100	—	ppm/℃

Note : When $V_{IN}=V_{OUT}+2.0V$, as the output voltage declined 2%, the $V_{DIF}=V_{IN}-V_{OUT}$.

TLV70440DBVR(MS)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Output Voltage	V_{OUT}	$V_{IN}=V_{OUT}+2.0V$, $I_{OUT}=10mA$	3.92	4.0	4.08	V
Output Current	I_{OUT}	$V_{IN}=V_{OUT}+2.0V$	70	100	—	mA
Load Regulation	$\triangle V_{OUT}$	$V_{IN}=V_{OUT}+2.0V$ $1mA\leq I_{OUT}\leq 50mA$	—	25	60	mV
Voltage Drop	V_{DIF}	$I_{OUT}=1mA$, $\triangle V_{OUT}=2\%$	—	25	55	mV
Quiescent Current	I_{SS}	No Load	—	1.5	3.0	μA
Line Regulation	$\triangle V_{OUT}/V_{OUT}*\triangle V_{IN}$	$V_{OUT}+1.0V\leq V_{IN}\leq 30V$, $I_{OUT}=1mA$	—	—	0.2	%/V
Input Voltage	V_{IN}	—	—	—	30	V
Temperature Coefficient	$\triangle V_{OUT}/\triangle T_A*V_{OUT}$	$V_{IN}=V_{OUT}+2.0V$, $I_{OUT}=10mA$, $-40℃\leq T_A\leq 85℃$	—	100	—	ppm/℃

Note : When $V_{IN}=V_{OUT}+2.0V$, as the output voltage declined 2%, the $V_{DIF}=V_{IN}-V_{OUT}$.

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TLV70444DBVR(MS)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Output Voltage	V_{OUT}	$V_{IN}=V_{OUT}+2.0V$ ， $I_{OUT}=10mA$	4.312	4.4	4.488	V
Output Current	I_{OUT}	$V_{IN}=V_{OUT}+2.0V$	70	100	—	mA
Load Regulation	$\triangle V_{OUT}$	$V_{IN}=V_{OUT}+2.0V$ $1mA\leqslant I_{OUT}\leqslant 50mA$	—	25	60	mV
Voltage Drop	V_{DIF}	$I_{OUT}=1mA$， $\triangle V_{OUT}=2\%$	—	25	55	mV
Quiescent Current	I_{SS}	No Load	—	1.5	3.0	µA
Line Regulation	$\triangle V_{OUT}/ V_{OUT}*\triangle V_{IN}$	$V_{OUT}+1.0V\leqslant V_{IN}\leqslant 30V$， $I_{OUT}=1mA$	—	—	0.2	%/V
Input Voltage	V_{IN}	—	—	—	30	V
Temperature Coefficient	$\triangle V_{OUT}/\triangle T_A*V_{OUT}$	$V_{IN}= V_{OUT}+2.0V$， $I_{OUT}=10mA$， $-40℃\leqslant T_A\leqslant 85℃$	—	100	—	ppm/℃

Note： When $V_{IN}=V_{OUT}+2.0V$, as the output voltage declined 2%, the $V_{DIF}=V_{IN}-V_{OUT}$.

TLV70450DBVR(MS)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Output Voltage	V_{OUT}	$V_{IN}=V_{OUT}+2.0V$ ， $I_{OUT}=10mA$	4.9	5.0	5.1	V
Output Current	I_{OUT}	$V_{IN}=V_{OUT}+2.0V$	100	150	—	mA
Load Regulation	$\triangle V_{OUT}$	$V_{IN}=V_{OUT}+2.0V$ $1mA\leqslant I_{OUT}\leqslant 70mA$	—	25	60	mV
Voltage Drop	V_{DIF}	$I_{OUT}=1mA$， $\triangle V_{OUT}=2\%$	—	25	55	mV
Quiescent Current	I_{SS}	No Load	—	1.5	3.0	µA
Line Regulation	$\triangle V_{OUT}/ V_{OUT}*\triangle V_{IN}$	$V_{OUT}+1.0 V\leqslant V_{IN}\leqslant 30V$， $I_{OUT}=1mA$	—	—	0.2	%/V
Input Voltage	V_{IN}	—	—	—	30	V
Temperature Coefficient	$\triangle V_{OUT}/\triangle T_A*V_{OUT}$	$V_{IN}= V_{OUT}+2.0V$， $I_{OUT}=10mA$， $-40℃\leqslant T_A\leqslant 85℃$	—	100	—	ppm/℃

Note： When $V_{IN}=V_{OUT}+2.0V$, as the output voltage declined 2%, the $V_{DIF}=V_{IN}-V_{OUT}$.

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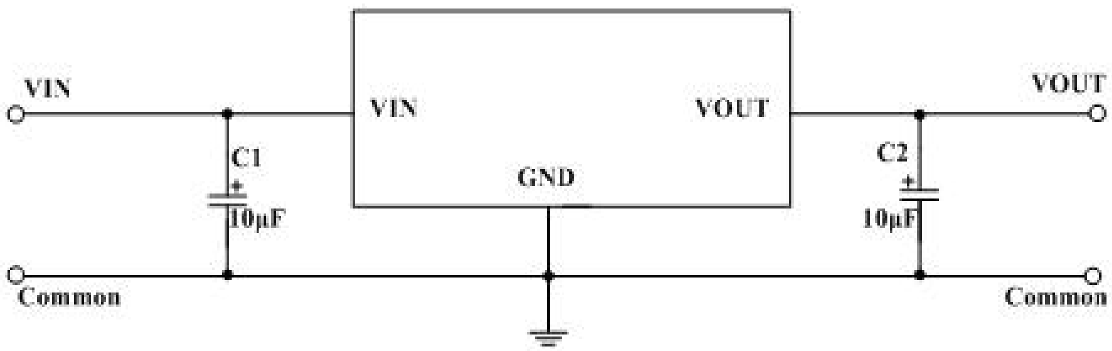
FUNCTIONAL DESCRIPTION

TLV70XXXDBVR(MS) series are linear voltage regulator ICs withstanding 30V voltage. The series IC consists of a voltage reference, an error amplifier, a current limiter and a phase compensation circuit plus a driver transistor. The output stabilization capacitor is also compatible with low ESR ceramic capacitors.

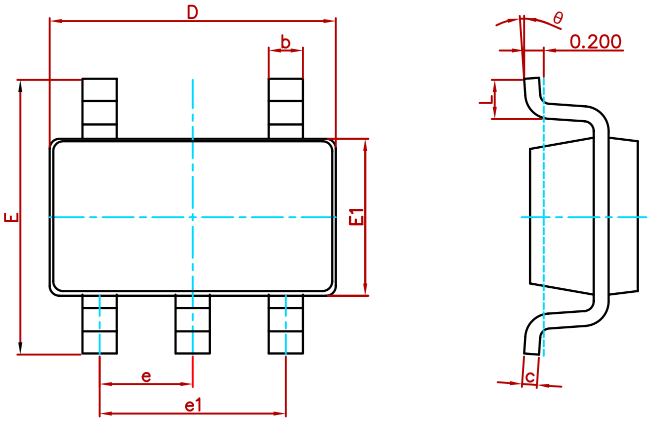
The over current protection circuit and the over voltage protection circuit are built-in. The protection circuit will operate when the output current or input voltage reaches limit level.

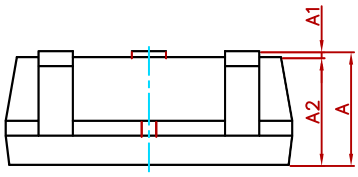
TYPICAL APPLICATION CIRCUIT

Basic Circuit



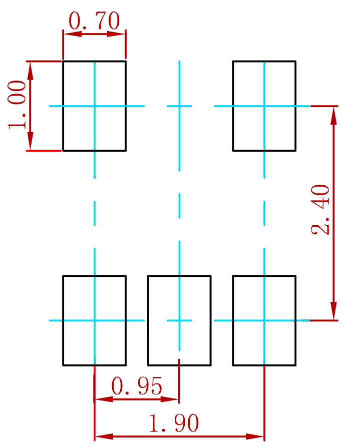
Package Outline Dimensions





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	2.650	2.950	0.104	0.116
E1	1.500	1.700	0.059	0.067
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°

Suggested Pad Layout



Note:
1.Controlling dimension:in millimeters.
2.General tolerance:± 0.05mm.
3.The pad layout is for reference purposes only.

REEL SPECIFICATION

P/N	PKG	QTY
TLV70XXXDBVR(MS)	SOT-23-5	3000

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