VOLTAGE REGULATOR WITH ON/OFF SWITCH

FEATURES

- **Low Dropout Voltage**
- **Electronic ON/OFF Switch**
- **Very Low Standby Current (ON, No Load)**
- **Internal Thermal Shutdown**
- **Short Circuit Protection**
- **Very Low (<100 nA) Current in OFF Mode**
- **Customized Versions Are Available**

APPLICATIONS

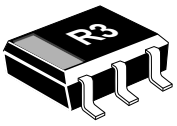
- **Battery Powered Systems**
- **Cellular Telephones**
- **Pagers**
- **Personal Communications Equipment**
- **Portable Instrumentation**
- **Portable Consumer Equipment**
- **Radio Control Systems**
- **Toys**
- **Low Voltage Systems**

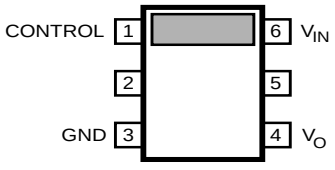
DESCRIPTION

The TK114xx is a low power, linear regulator with a built-in electronic switch. The internal electronic switch can be controlled by an external pull-up resistor and an open drain or open collector transistor. The device is in the OFF state when the control pin is biased from V_{IN} through the pull-up resistor.

An internal PNP pass-transistor is used in order to achieve low dropout voltage (typically 200 mV at 50 mA load current). The device has very low quiescent current (500 µA) in the ON mode with no load and 2 mA with 30 mA load. The quiescent current is typically 4 mA at 60 mA load. An internal thermal shutdown circuit limits the junction temperature to below 150 °C. The load current is internally monitored and the device will shut down (no load current) in the presence of a short circuit at the output. The device is available in a small SOT-23L surface mount package.

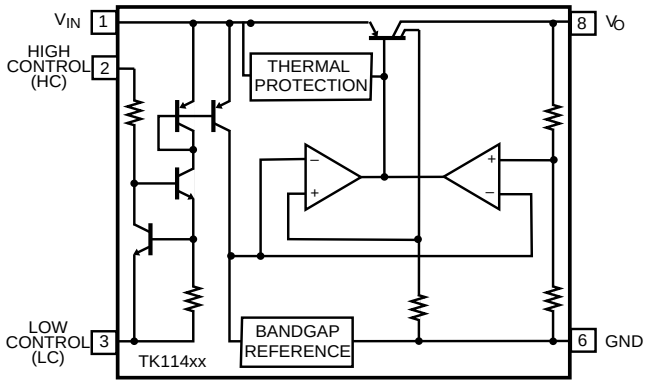
TK114xxM





KT114xxM.PO

BLOCK DIAGRAM



KT114xx • BD

ORDERING INFORMATION

TK114 □□ □□

Tape/Reel Code

Voltage Code

VOLTAGE CODE	
30 = 3.0 V	47 = 4.75 V
32 = 3.25 V	50 = 5.0 V
35 = 3.5 V	55 = 5.5 V
37 = 3.75 V	57 = 5.75 V
40 = 4.0 V	60 = 6.0 V
45 = 4.5 V	80 = 8.0 V

TAPE/REEL CODE
BX : Bulk/Bag
TL : Tape Left

ABSOLUTE MAXIMUM RATINGS

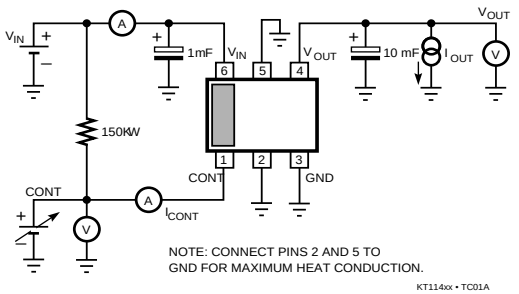
Supply Voltage ..... 16 V
Load Current ..... 180 mA
Power Dissipation (Note 1) ..... 400 mW
Storage Temperature Range ..... -55 to +150 °C
Operating Temperature Range ..... -30 to +80 °C
Lead Soldering Temp. (10 sec.) ..... 240 °C
Junction Temperature ..... 150 °C

TK11430 ELECTRICAL CHARACTERISTICS

SYMBOL	PARAMETER	TEST CONDITION	MIN	TYP	MAX	UNITS
I_{IN1}	Supply Current 1	V_{IN} = 4 V, I_O = 0 mA		500	900	µA
I_{IN2}	Supply Current 2	V_{IN} = 2.5 V, I_O = 0 mA		1	2.5	µA
I_{INS}	Standby Current	V_{IN} = 10 V, Output Off			0.1	µA
V_O	Output Voltage Regulation	V_{IN} = 4 V, I_O = 30 mA	2.9	3.0	3.1	%
V_{DROP}	Dropout Voltage	I_O = 30 mA		0.12	0.3	V
I_O	Output Current		70	110		mA
I_{OR}	Recommended Output Current				70	mA
LinReg	Line Regulation	V_{IN} = 4 V → 9 V		5	30	mV
LoaReg	Load Regulation	I_O = 0 mA to 30 mA		18	50	mV
		I_O = 0 mA to 60 mA		36	80	mV
RR	Ripple Rejection	100 mV(rms), f = 400 Hz V_{IN} = 4.5 V, I_O = 10 mA		55		dB
ΔV/ΔT	V_O Temperature Coefficient	V_{IN} = 4.5 V, I_O = 10 mA -20 °C ≤ T_A ≤ 75 °C		±0.3		mV/°C
V_N	Output Noise Voltage	V_{IN} = 4.5 V, I_O = 10 mA		180		µV(rms)
Control Pin						
I_{CONT}	Control Pin Current	On Mode		35	120	µA
V_{Coff}	Control Pin Voltage	Off Mode	V_{IN}-0.2		V_{IN}	V
V_{Con}	Control Pin Voltage	On Mode	0		0.6	V

Note 1: Power dissipation must be derated at the rate of 1.6 mW/ °C for operation above T_A = 25 °C.

TEST CIRCUIT 1



TK11432 ELECTRICAL CHARACTERISTICS

SYMBOL	PARAMETER	TEST CONDITION	MIN	TYP	MAX	UNITS
I_{IN1}	Supply Current 1	V_{IN} = 4.2 V, I_O = 0 mA		500	900	µA
I_{IN2}	Supply Current 2	V_{IN} = 2.5 V, I_O = 0 mA		1	2.5	µA
I_{INS}	Standby Current	V_{IN} = 10 V, Output Off			0.1	µA
V_O	Output Voltage Regulation	V_{IN} = 4.2 V, I_O = 30 mA	3.13	3.25	3.37	%
V_{DROP}	Dropout Voltage	I_O = 30 mA		0.12	0.3	V
I_O	Output Current	(Note 2)	70	110		mA
I_{OR}	Recommended Output Current				70	mA
LinReg	Line Regulation	V_{IN} = 4.2 V → 9.2 V		6	30	mV
LoaReg	Load Regulation	V_{IN} = 4.2 V, I_O = 0 mA to 30 mA		20	50	mV
		V_{IN} = 4.2 V, I_O = 0 mA to 60 mA		40	80	mV
RR	Ripple Rejection	100 mV(rms), f = 400 Hz V_{IN} = 4.7 V, I_O = 10 mA		55		dB
ΔV/ΔT	V_O Temperature Coefficient	V_{IN} = 4.7 V, I_O = 10 mA -20 °C ≤ T_A ≤ 75 °C		±0.3		mV/°C
V_N	Output Noise Voltage	10 Hz ≤ f ≤ 100 KHz, I_O = 10 mA		180		µV(rms)
Control Pin						
I_{CONT}	Control Pin Current	On Mode		35	120	µA
V_{Coff}	Control Pin Voltage	Off Mode	V_{IN}-0.2		V_{IN}	V
V_{Con}	Control Pin Voltage	On Mode	0		0.6	V

Note 2: I_O (Load Current) is current when V_O drop down 0.3V from V_O at I_O = 30 mA.

TK11435 ELECTRICAL CHARACTERISTICS

SYMBOL	PARAMETER	TEST CONDITION	MIN	TYP	MAX	UNITS
I_{IN1}	Supply Current 1	V_{IN} = 4.5 V, I_O = 0 mA		500	900	µA
I_{IN2}	Supply Current 2	V_{IN} = 2.5 V, I_O = 0 mA		1	2.5	µA
I_{INS}	Standby Current	V_{IN} = 10 V, Output Off			0.1	µA
V_O	Output Voltage Regulation	V_{IN} = 4.5 V, I_O = 30 mA	3.38	3.5	3.62	%
V_{DROP}	Dropout Voltage	I_O = 30 mA		0.12	0.3	V
I_O	Output Current	(Note 2)	70	110		mA
I_{OR}	Recommended Output Current				70	mA
LinReg	Line Regulation	V_{IN} = 4.5 V → 9.5 V		7	35	mV
LoaReg	Load Regulation	I_O = 0 mA to 30 mA		20	55	mV
		I_O = 0 mA to 60 mA		40	95	**mV**
RR	Ripple Rejection	100 mV(rms), f = 400 Hz V_{IN} = 4.5 V, I_O = 10 mA		55		dB
ΔV/ΔT	V_O Temperature Coefficient	V_{IN} = 4.5 V, I_O = 10 mA -20 °C ≤ T_A ≤ 75 °C		±0.3		mV/°C
V_N	Output Noise Voltage	V_{IN} = 4.5 V, I_O = 10 mA		180		µV(rms)
Control Pin						
I_{CONT}	Control Pin Current	On Mode		35	120	µA
V_{Coff}	Control Pin Voltage	Off Mode	V_{IN}-0.2		V_{IN}	V
V_{Con}	Control Pin Voltage	On Mode	0		0.6	V

Note 2: I_O (Load Current) is current when V_O drop down 0.3V from V_O at I_O = 30 mA.

TK11437 ELECTRICAL CHARACTERISTICS

SYMBOL	PARAMETER	TEST CONDITION	MIN	TYP	MAX	UNITS
I_{IN1}	Supply Current 1	V_{IN} = 4.7 V, I_O = 0 mA		500	900	µA
I_{IN2}	Supply Current 2	V_{IN} = 2.7 V, I_O = 0 mA		1	2.5	µA
I_{INS}	Standby Current	V_{IN} = 10 V, Output Off			0.1	µA
V_O	Output Voltage Regulation	V_{IN} = 4.7 V, I_O = 30 mA	3.62	3.75	3.88	%
V_{DROP}	Dropout Voltage	I_O = 30 mA		0.12	0.3	V
I_O	Output Current	(Note 2)	70	110		mA
I_{OR}	Recommended Output Current				70	mA
LinReg	Line Regulation	V_{IN} = 4.7 V $\rightarrow$ 9.7 V		7	35	mV
LoaReg	Load Regulation	I_O = 0 mA to 30 mA		20	110	mV
		I_O = 0 mA to 60 mA		40	100	mV
RR	Ripple Rejection	100 mV(rms), f = 400 Hz V_{IN} = 5.2 V, I_O = 10 mA		55		dB
$\Delta V/\Delta T$	V_O Temperature Coefficient	V_{IN} = 5.2 V, I_O = 10 mA -20 °C $\leq T_A \leq$ 75 °C		±0.4		mV/°C
V_N	Output Noise Voltage	V_{IN} = 4.5 V, I_O = 10 mA		180		µV(rms)
Control Pin						
I_{CONT}	Control Pin Current	On Mode		35	120	µA
V_{Coff}	Control Pin Voltage	Off Mode	V_{IN}-0.2		V_{IN}	V
V_{Con}	Control Pin Voltage	On Mode	0		0.6	V

Note 2: I_o (Load Current) is current when V_o drop down 0.3V from V_o at I_o = 30 mA.

TK11440 ELECTRICAL CHARACTERISTICS

SYMBOL	PARAMETER	TEST CONDITION	MIN	TYP	MAX	UNITS
I_{IN1}	Supply Current 1	V_{IN} = 5 V, I_O = 0 mA		500	900	µA
I_{IN2}	Supply Current 2	V_{IN} = 3.0 V, I_O = 0 mA		1	2.5	µA
I_{INS}	Standby Current	V_{IN} = 10 V, Output Off			0.1	µA
V_O	Output Voltage Regulation	V_{IN} = 5 V, I_O = 30 mA	3.86	4.0	3.1	%
V_{DROP}	Dropout Voltage	I_O = 30 mA		0.12	0.3	V
I_O	Output Current	(Note 2)	70	110		mA
I_{OR}	Recommended Output Current				70	mA
LinReg	Line Regulation	V_{IN} = 5 V → 10 V		8	40	mV
LoaReg	Load Regulation	I_O = 0 mA to 30 mA		24	60	mV
		I_O = 0 mA to 60 mA		48	100	mV
RR	Ripple Rejection	100 mV(rms), f = 400 Hz V_{IN} = 5.5 V, I_O = 10 mA		55		dB
ΔV/ΔT	V_O Temperature Coefficient	V_{IN} = 5.5 V, I_O = 10 mA -20 °C ≤ T_A ≤ 75 °C		±0.4		mV/°C
V_N	Output Noise Voltage	V_{IN} = 5.5 V, I_O = 10 mA		180		µV(rms)
Control Pin						
I_{CONT}	Control Pin Current	On Mode		35	120	µA
V_{Coff}	Control Pin Voltage	Off Mode	V_{IN}-0.2		V_{IN}	V
V_{Con}	Control Pin Voltage	On Mode	0		0.6	V

Note 2: I_O (Load Current) is current when V_O drop down 0.3V from V_O at I_O = 30 mA.

TK11445 ELECTRICAL CHARACTERISTICS

SYMBOL	PARAMETER	TEST CONDITION	MIN	TYP	MAX	UNITS
I_{IN1}	Supply Current 1	V_{IN} = 5 V, I_O = 0 mA		500	900	µA
I_{IN2}	Supply Current 2	V_{IN} = 3.5 V, I_O = 0 mA		1	2.5	µA
I_{INS}	Standby Current	V_{IN} = 10 V, Output Off			0.1	µA
V_O	Output Voltage Regulation	V_{IN} = 5.5 V, I_O = 30 mA	4.34	4.5	4.66	%
V_{DROP}	Dropout Voltage	I_O = 30 mA		0.12	0.3	V
I_O	Output Current	(Note 2)	70	110		mA
I_{OR}	Recommended Output Current				70	mA
LinReg	Line Regulation	V_{IN} = 5.5 V $\rightarrow$ 10.5 V		8	40	mV
LoaReg	Load Regulation	I_O = 0 mA to 30 mA		25	65	mV
		I_O = 0 mA to 60 mA		55	110	mV
RR	Ripple Rejection	100 mV(rms), f = 400 Hz V_{IN} = 6 V, I_O = 10 mA		55		dB
$\Delta V/\Delta T$	V_O Temperature Coefficient	V_{IN} = 6V, I_O = 10 mA -20 °C $\leq T_A \leq$ 75 °C		±0.5		mV/°C
V_N	Output Noise Voltage	V_{IN} =6 V, I_O = 10 mA		180		µV(rms)
Control Pin						
I_{CONT}	Control Pin Current	On Mode		35	120	µA
V_{Coff}	Control Pin Voltage	Off Mode	V_{IN}-0.2		V_{IN}	V
V_{Con}	Control Pin Voltage	On Mode	0		0.6	V

Note 2: I_O (Load Current) is current when V_O drop down 0.3V from V_O at I_O = 30 mA.

TK11447 ELECTRICAL CHARACTERISTICS

SYMBOL	PARAMETER	TEST CONDITION	MIN	TYP	MAX	UNITS
I_{IN1}	Supply Current 1	V_{IN} = 5.7 V, I_O = 0 mA		500	900	µA
I_{IN2}	Supply Current 2	V_{IN} = 3.7 V, I_O = 0 mA		1	2.5	µA
I_{INS}	Standby Current	V_{IN} = 10 V, Output Off			0.1	µA
V_O	Output Voltage Regulation	V_{IN} = 5.7 V, I_O = 30 mA	4.58	4.75	4.92	%
V_{DROP}	Dropout Voltage	I_O = 30 mA		0.12	0.3	V
I_O	Output Current	(Note 2)	70	110		mA
I_{OR}	Recommended Output Current				70	mA
LinReg	Line Regulation	V_{IN} = 5.7 V → 10 .7 V		8	40	mV
LoaReg	Load Regulation	I_O = 0 mA to 30 mA		25	70	mV
		I_O = 0 mA to 60 mA		50	120	mV
RR	Ripple Rejection	100 mV(rms), f = 400 Hz V_{IN} = 6.2 V, I_O = 10 mA		55		dB
ΔV/ΔT	V_O Temperature Coefficient	V_{IN} = 6.2 V, I_O = 10 mA -20 °C ≤ T_A ≤ 75 °C		±0.6		mV/°C
V_N	Output Noise Voltage	V_{IN} = 6.2 V, I_O = 10 mA		180		µV(rms)
Control Pin						
I_{CONT}	Control Pin Current	On Mode		35	120	µA
V_{Coff}	Control Pin Voltage	Off Mode	V_{IN}-0.2		V_{IN}	V
V_{Con}	Control Pin Voltage	On Mode	0		0.6	V

Note 2: I_O (Load Current) is current when V_O drop down 0.3V from V_O at I_O = 30 mA.

TK11450 ELECTRICAL CHARACTERISTICS

SYMBOL	PARAMETER	TEST CONDITION	MIN	TYP	MAX	UNITS
I_{IN1}	Supply Current 1	V_{IN} = 6.0 V, I_O = 0 mA		500	900	µA
I_{IN2}	Supply Current 2	V_{IN} = 4.0 V, I_O = 0 mA		1	2.5	µA
I_{INS}	Standby Current	V_{IN} = 10 V, Output Off			0.1	µA
V_O	Output Voltage Regulation	V_{IN} = 6.0 V, I_O = 30 mA	4.83	5.0	5.17	%
V_{DROP}	Dropout Voltage	I_O = 30 mA		0.12	0.3	V
I_O	Output Current	(Note 2)	70	110		mA
I_{OR}	Recommended Output Current				70	mA
LinReg	Line Regulation	V_{IN} = 6 V → 11 V		8	40	mV
LoaReg	Load Regulation	I_O = 0 mA to 30 mA		25	70	mV
		I_O = 0 mA to 60 mA		60	120	mV
RR	Ripple Rejection	100 mV(rms), f = 400 Hz V_{IN} = 6.5 V, I_O = 10 mA		55		dB
ΔV/ΔT	V_O Temperature Coefficient	V_{IN} = 6.5 V, I_O = 10 mA -20 °C ≤ T_A ≤ 75 °C		±0.6		mV/°C
V_N	Output Noise Voltage	V_{IN} = 6.5 V, I_O = 10 mA		180		µV(rms)
Control Pin						
I_{CONT}	Control Pin Current	On Mode		35	120	µA
V_{Coff}	Control Pin Voltage	Off Mode	V_{IN}-0.2		V_{IN}	V
V_{Con}	Control Pin Voltage	On Mode	0		0.6	V

Note 2: I_O (Load Current) is current when V_O drop down 0.3V from V_O at I_O = 30 mA.

TK11455 ELECTRICAL CHARACTERISTICS

SYMBOL	PARAMETER	TEST CONDITION	MIN	TYP	MAX	UNITS
I_{IN1}	Supply Current 1	V_{IN} = 6.5 V, I_O = 0 mA		500	900	µA
I_{IN2}	Supply Current 2	V_{IN} = 4.5 V, I_O = 0 mA		1	2.5	µA
I_{INS}	Standby Current	V_{IN} = 10 V, Output Off			0.1	µA
V_O	Output Voltage Regulation	V_{IN} = 6.5 V, I_O = 30 mA	5.31	5.5	5.69	%
V_{DROP}	Dropout Voltage	I_O = 30 mA		0.12	0.3	V
I_O	Output Current	(Note 2)	70	110		mA
I_{OR}	Recommended Output Current				70	mA
LinReg	Line Regulation	V_{IN} = 6.5 V $\rightarrow$ 11.5 V		8	40	mV
LoaReg	Load Regulation	I_O = 0 mA to 30 mA		30	75	mV
		I_O = 0 mA to 60 mA		65	130	mV
RR	Ripple Rejection	100 mV(rms), f = 400 Hz V_{IN} = 7.0 V, I_O = 10 mA		55		dB
$\Delta V/\Delta T$	V_O Temperature Coefficient	V_{IN} = 7.0 V, I_O = 10 mA -20 °C $\leq T_A \leq$ 75 °C		±0.7		mV/°C
V_N	Output Noise Voltage	V_{IN} = 7.0 V, I_O = 10 mA		180		µV(rms)
Control Pin						
I_{CONT}	Control Pin Current	On Mode		35	120	µA
V_{Coff}	Control Pin Voltage	Off Mode	V_{IN}-0.2		V_{IN}	V
V_{Con}	Control Pin Voltage	On Mode	0		0.6	V

Note 2: I_O (Load Current) is current when V_O drop down 0.3V from V_O at I_O = 30 mA.

TK11460 ELECTRICAL CHARACTERISTICS

SYMBOL	PARAMETER	TEST CONDITION	MIN	TYP	MAX	UNITS
I_{IN1}	Supply Current 1	V_{IN} = 7.0 V, I_O = 0 mA		500	900	µA
I_{IN2}	Supply Current 2	V_{IN} = 5.0 V, I_O = 0 mA		1	3.0	µA
I_{INS}	Standby Current	V_{IN} = 10 V, Output Off			0.1	µA
V_O	Output Voltage Regulation	V_{IN} = 7.0 V, I_O = 30 mA	5.79	6.0	6.21	%
V_{DROP}	Dropout Voltage	I_O = 30 mA		0.12	0.3	V
I_O	Output Current	(Note 2)	70	110		mA
I_{OR}	Recommended Output Current				70	mA
LinReg	Line Regulation	V_{IN} = 7.0 V → 12 V		8	40	mV
LoaReg	Load Regulation	I_O = 0 mA to 30 mA		30	80	mV
		I_O = 0 mA to 60 mA		65	140	mV
RR	Ripple Rejection	100 mV(rms), f = 400 Hz V_{IN} = 7.5 V, I_O = 10 mA		55		dB
ΔV/ΔT	V_O Temperature Coefficient	V_{IN} = 7.5 V, I_O = 10 mA -20 °C ≤ T_A ≤ 75 °C		±0.7		mV/°C
V_N	Output Noise Voltage	V_{IN} = 7.5 V, I_O = 10 mA		180		µV(rms)
Control Pin						
I_{CONT}	Control Pin Current	On Mode		35	120	µA
V_{Coff}	Control Pin Voltage	Off Mode	V_{IN}-0.2		V_{IN}	V
V_{Con}	Control Pin Voltage	On Mode	0		0.6	V

Note 2: I_O (Load Current) is current when V_O drop down 0.3V from V_O at I_O = 30 mA.

TK11480 ELECTRICAL CHARACTERISTICS

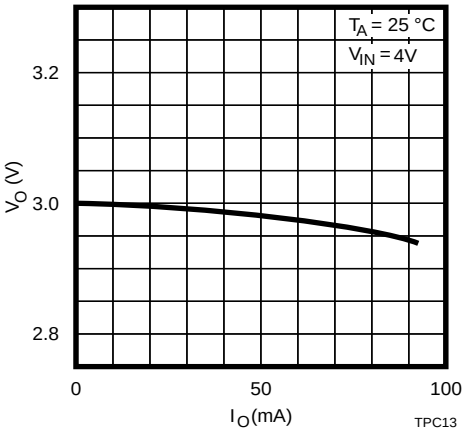
SYMBOL	PARAMETER	TEST CONDITION	MIN	TYP	MAX	UNITS
I_{IN1}	Supply Current 1	V_{IN} = 9.0 V, I_O = 0 mA		500	900	µA
I_{IN2}	Supply Current 2	V_{IN} = 7.0 V, I_O = 0 mA		1	3.0	µA
I_{INS}	Standby Current	V_{IN} = 10 V, Output Off			0.1	µA
V_O	Output Voltage Regulation	V_{IN} = 9.0 V, I_O = 30 mA	7.72	8.0	8.28	%
V_{DROP}	Dropout Voltage	I_O = 30 mA		0.12	0.3	V
I_O	Output Current	(Note 2)	70	110		mA
I_{OR}	Recommended Output Current				70	mA
LinReg	Line Regulation	V_{IN} = 9 V → 13 V		8	40	mV
LoaReg	Load Regulation	I_O = 0 mA to 30 mA		30	100	mV
		I_O = 0 mA to 60 mA		65	180	mV
RR	Ripple Rejection	100 mV(rms), f = 400 Hz V_{IN} = 9.5 V, I_O = 10 mA		55		dB
ΔV/ΔT	V_O Temperature Coefficient	V_{IN} = 9.5 V, I_O = 10 mA -20 °C ≤ T_A ≤ 75 °C		±0.7		mV/°C
V_N	Output Noise Voltage	V_{IN} = 9.5 V, I_O = 10 mA		220		µV(rms)
Control Pin						
I_{CONT}	Control Pin Current	On Mode		35	120	µA
V_{Coff}	Control Pin Voltage	Off Mode	V_{IN}-0.2		V_{IN}	V
V_{Con}	Control Pin Voltage	On Mode	0		0.6	V

Note 2: I_O (Load Current) is current when V_O drop down 0.3V from V_O at I_O = 30 mA.

TYPICAL PERFORMANCE CHARACTERISTICS

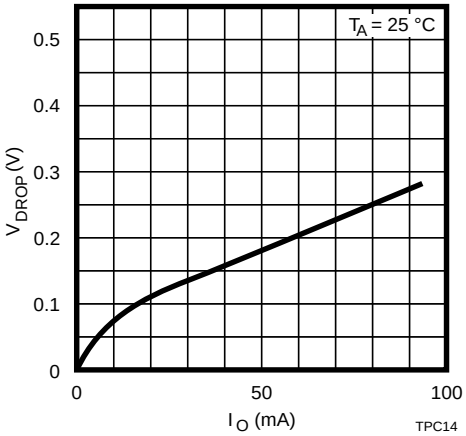
TK11430

OUTPUT VOLTAGE vs OUTPUT CURRENT



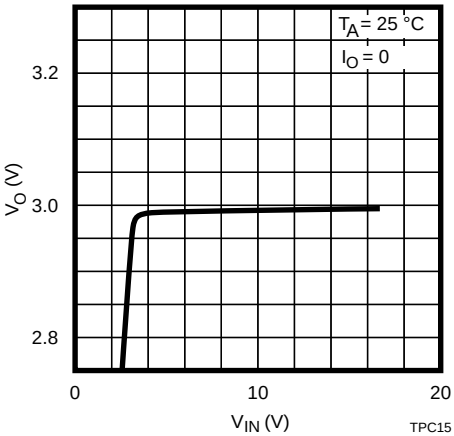
TPC13

DROPOUT VOLTAGE vs LOAD CURRENT



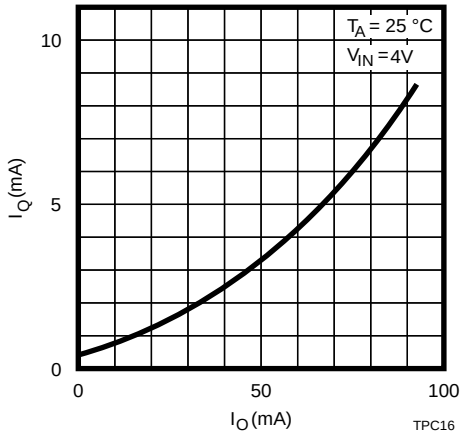
TPC14

OUTPUT VOLTAGE vs INPUT VOLTAGE



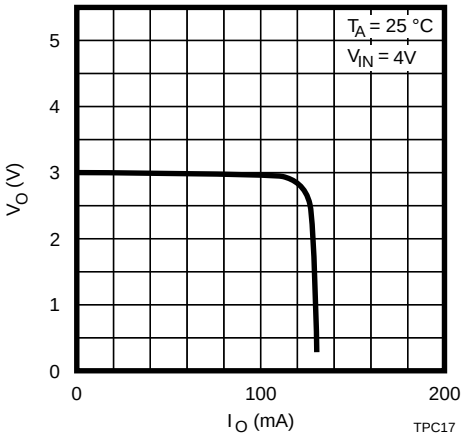
TPC15

QUIESCENT CURRENT vs LOAD CURRENT



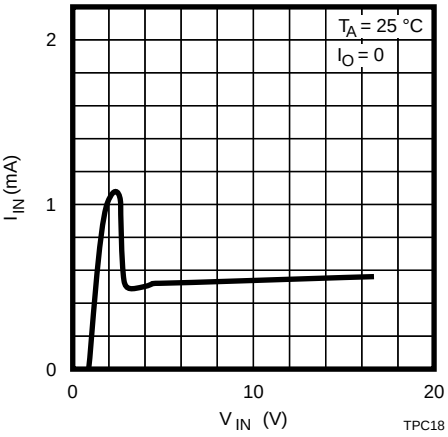
TPC16

SHORT CIRCUIT PROTECTION



TPC17

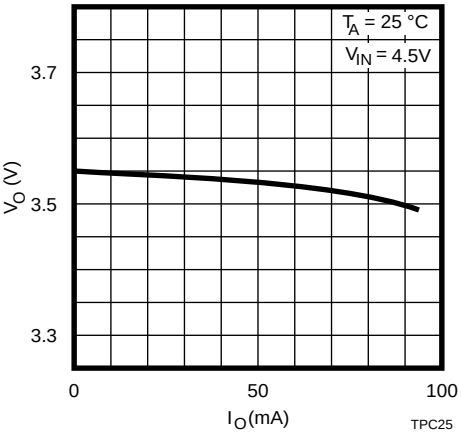
INPUT CURRENT vs INPUT VOLTAGE



TPC18

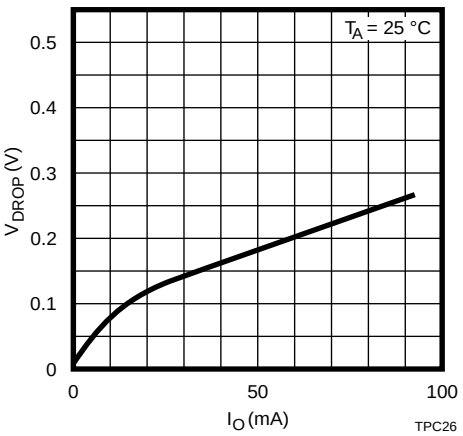
TK11435

OUTPUT VOLTAGE vs OUTPUT CURRENT



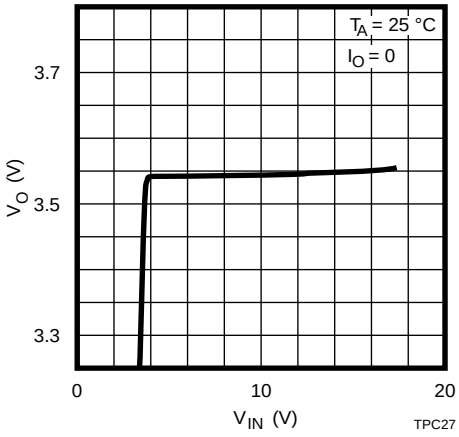
TPC25

DROPOUT VOLTAGE vs LOAD CURRENT



TPC26

OUTPUT VOLTAGE vs INPUT VOLTAGE

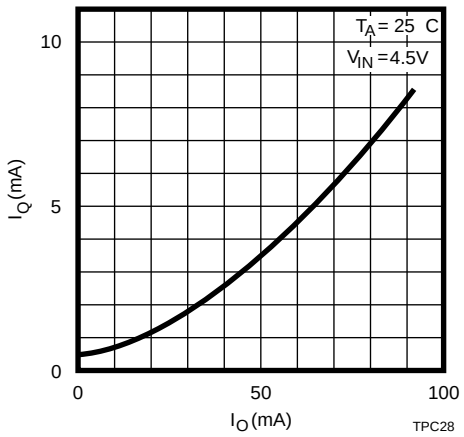


TPC27

TYPICAL PERFORMANCE CHARACTERISTICS (CONT.)

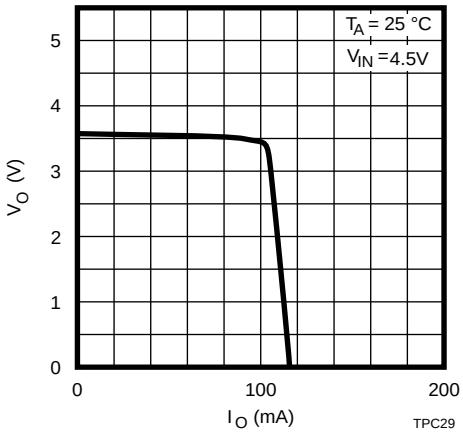
TK11435 (CONT.)

QUIESCENT CURRENT vs LOAD CURRENT



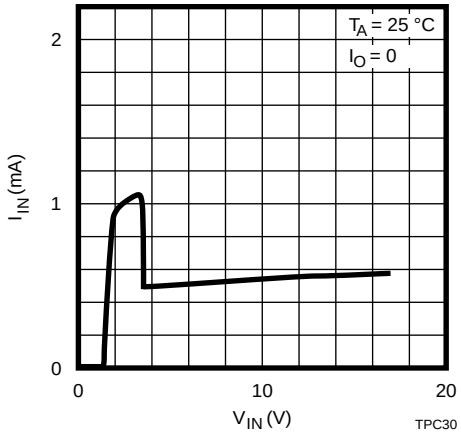
TPC28

SHORT CIRCUIT PROTECTION



TPC29

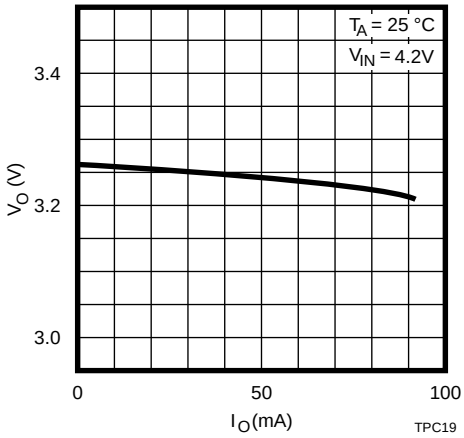
INPUT CURRENT vs INPUT VOLTAGE



TPC30

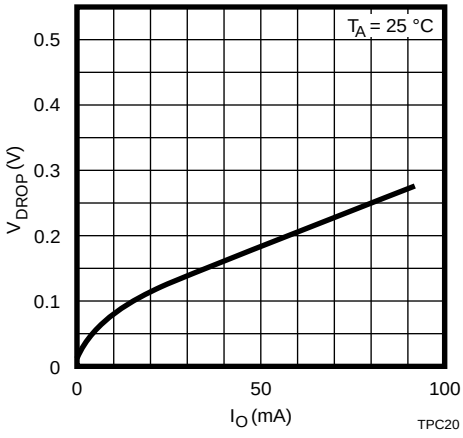
TK11437

OUTPUT VOLTAGE vs OUTPUT CURRENT



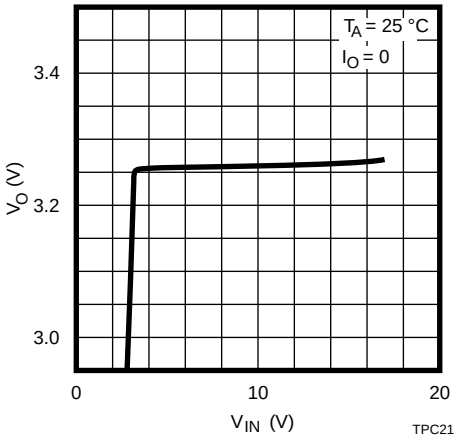
TPC19

DROPOUT VOLTAGE vs LOAD CURRENT



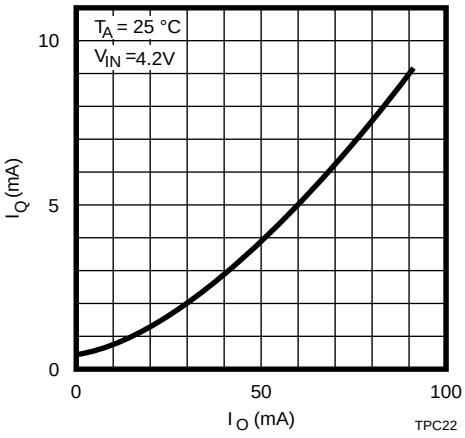
TPC20

OUTPUT VOLTAGE vs INPUT VOLTAGE



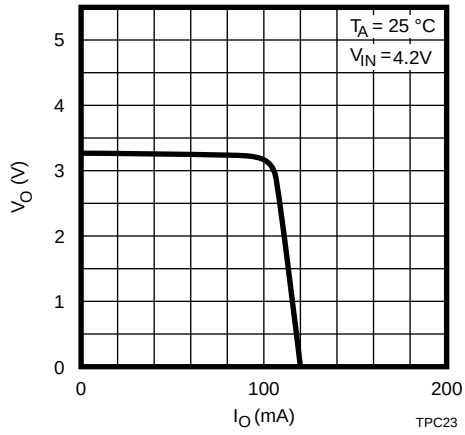
TPC21

QUIESCENT CURRENT vs LOAD CURRENT



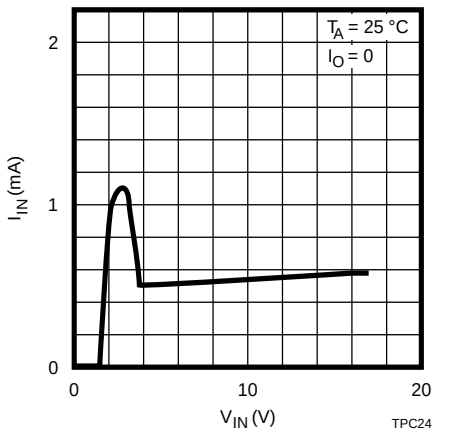
TPC22

SHORT CIRCUIT PROTECTION



TPC23

INPUT CURRENT vs INPUT VOLTAGE

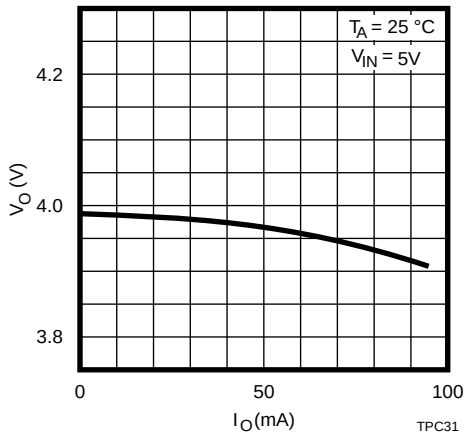


TPC24

TYPICAL PERFORMANCE CHARACTERISTICS (CONT.)

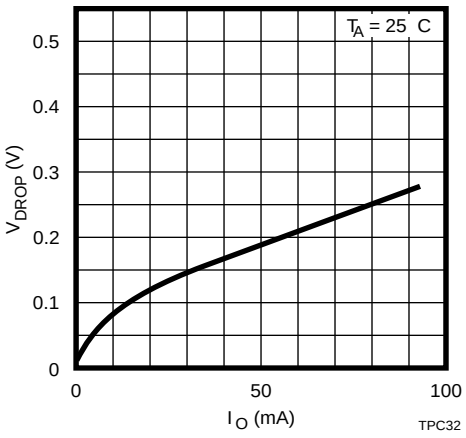
TK11440

OUTPUT VOLTAGE vs OUTPUT CURRENT



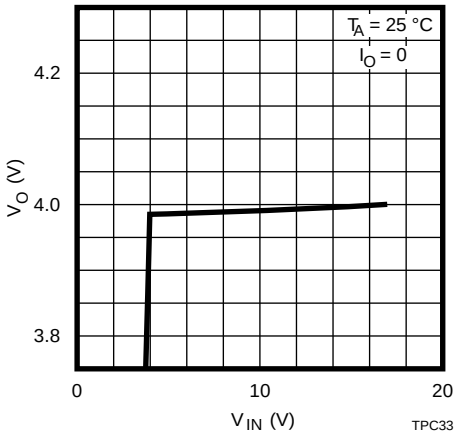
TPC31

DROPOUT VOLTAGE vs LOAD CURRENT



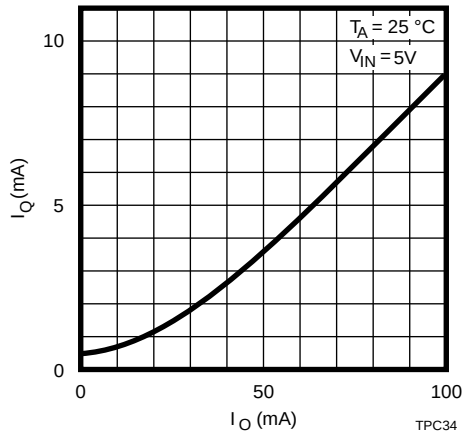
TPC32

OUTPUT VOLTAGE vs INPUT VOLTAGE



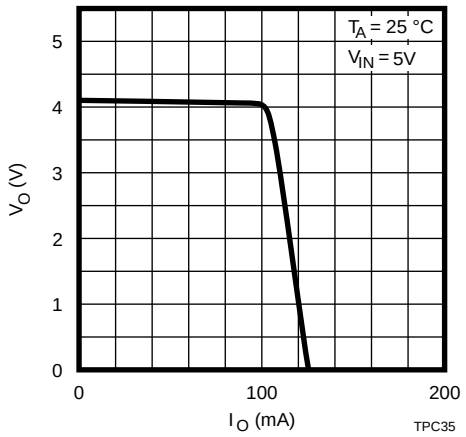
TPC33

QUIESCENT CURRENT vs LOAD CURRENT



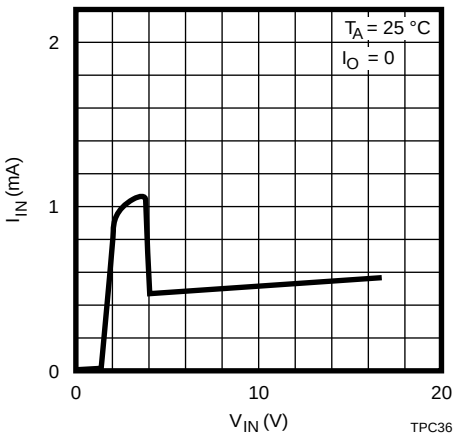
TPC34

SHORT CIRCUIT PROTECTION



TPC35

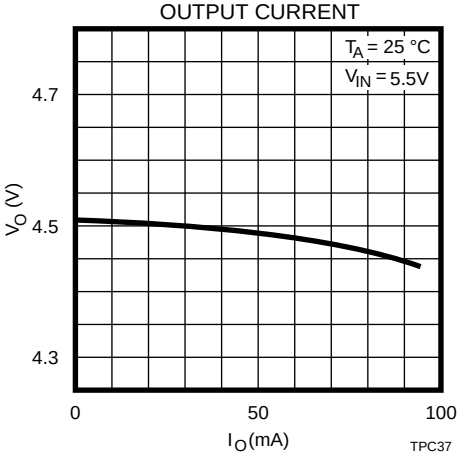
INPUT CURRENT vs INPUT VOLTAGE



TPC36

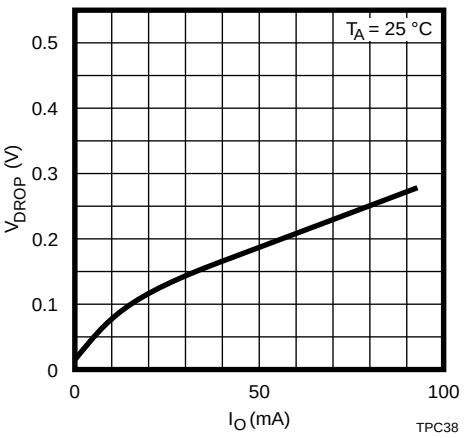
TK11445

OUTPUT VOLTAGE vs OUTPUT CURRENT



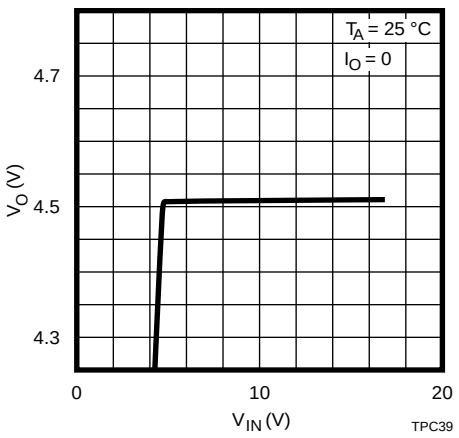
TPC37

DROPOUT VOLTAGE vs LOAD CURRENT



TPC38

OUTPUT VOLTAGE vs INPUT VOLTAGE

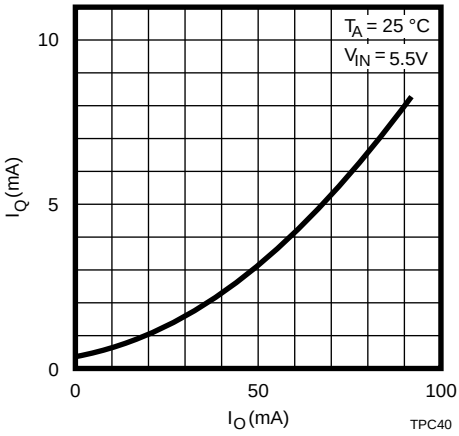


TPC39

TYPICAL PERFORMANCE CHARACTERISTICS (CONT.)

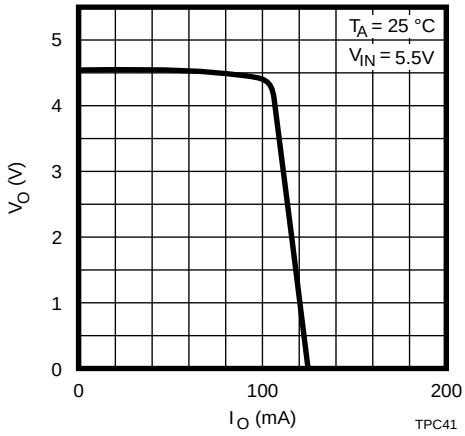
TK11445 (CONT.)

QUIESCENT CURRENT vs LOAD CURRENT



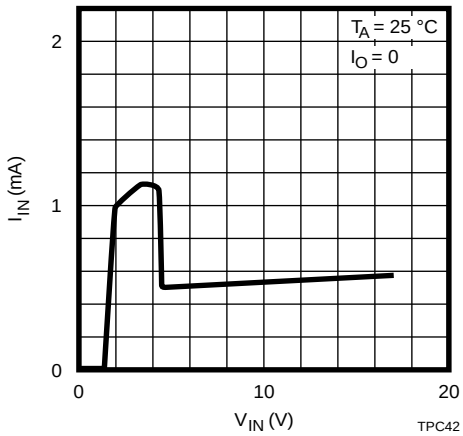
TPC40

SHORT CIRCUIT PROTECTION



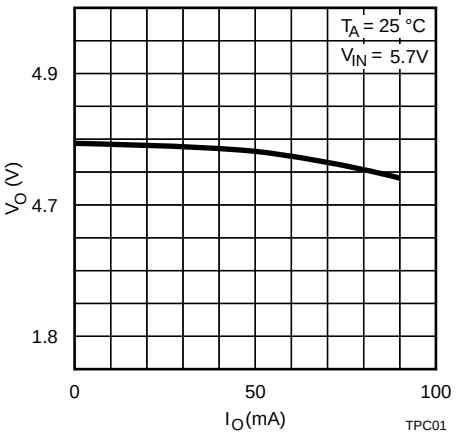
TPC41

INPUT CURRENT vs INPUT VOLTAGE



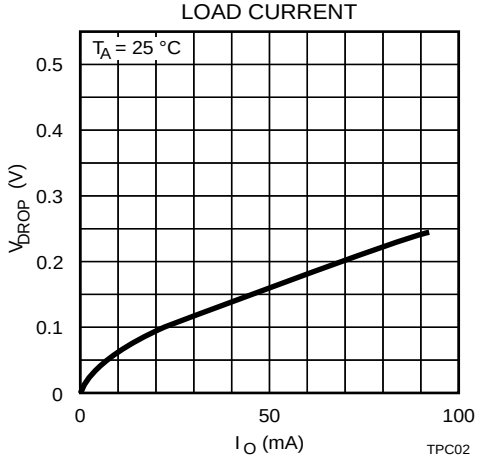
TPC42

TK11447 OUTPUT VOLTAGE vs OUTPUT CURRENT



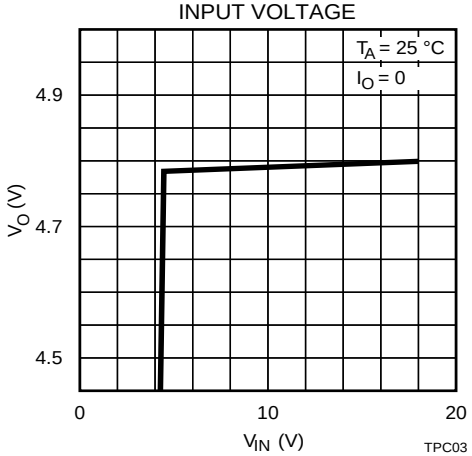
TPC01

DROPOUT VOLTAGE vs LOAD CURRENT



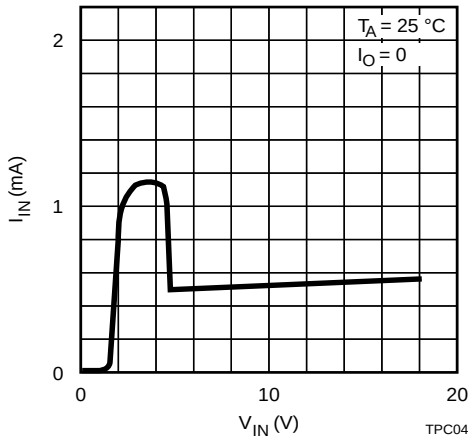
TPC02

OUTPUT VOLTAGE vs INPUT VOLTAGE



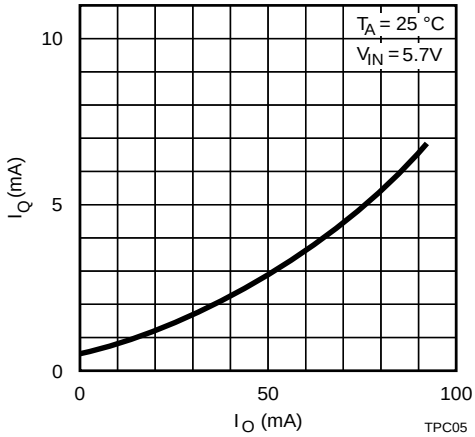
TPC03

INPUT CURRENT vs INPUT VOLTAGE



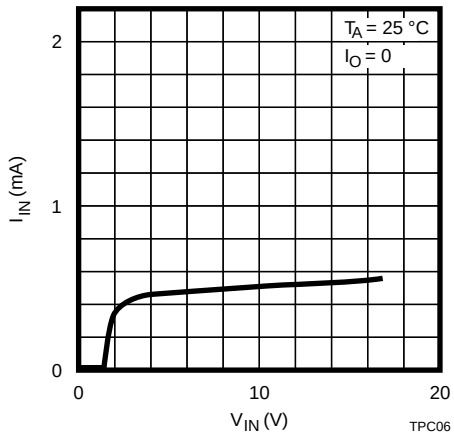
TPC04

QUIESCENT CURRENT vs LOAD CURRENT



TPC05

INPUT CURRENT vs INPUT VOLTAGE

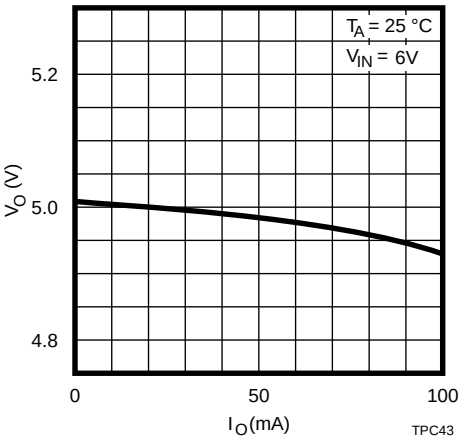


TPC06

TYPICAL PERFORMANCE CHARACTERISTICS (CONT.)

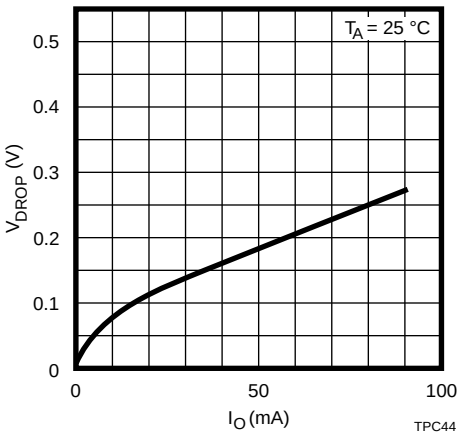
TK11450

OUTPUT VOLTAGE vs OUTPUT CURRENT



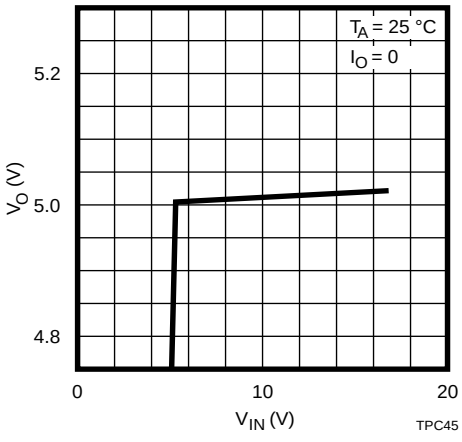
TPC43

DROPOUT VOLTAGE vs LOAD CURRENT



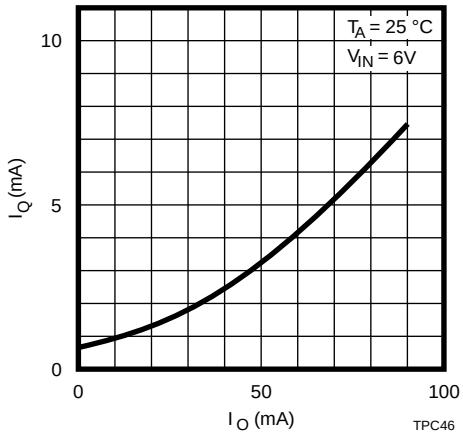
TPC44

OUTPUT VOLTAGE vs INPUT VOLTAGE



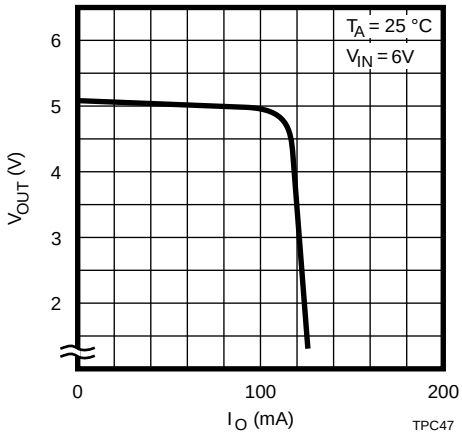
TPC45

QUIESCENT CURRENT vs LOAD CURRENT



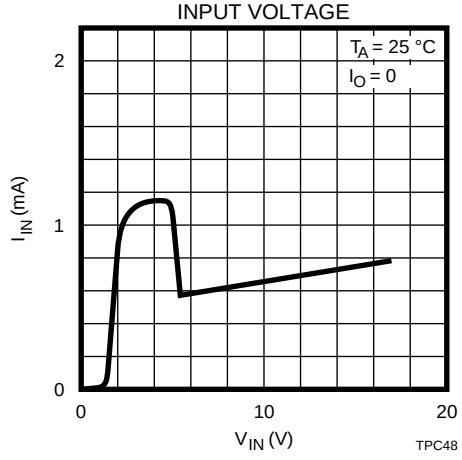
TPC46

SHORT CIRCUIT PROTECTION



TPC47

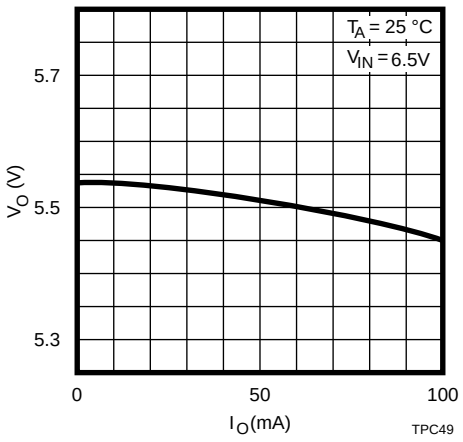
INPUT CURRENT vs INPUT VOLTAGE



TPC48

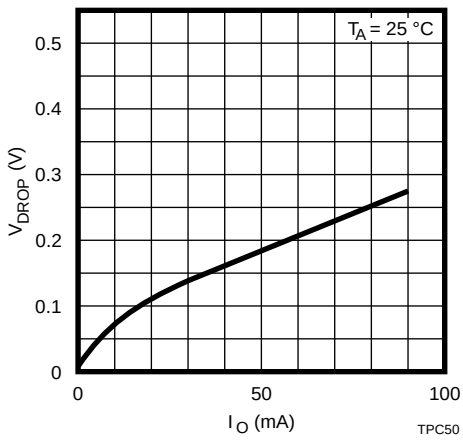
TK11455

OUTPUT VOLTAGE vs OUTPUT CURRENT



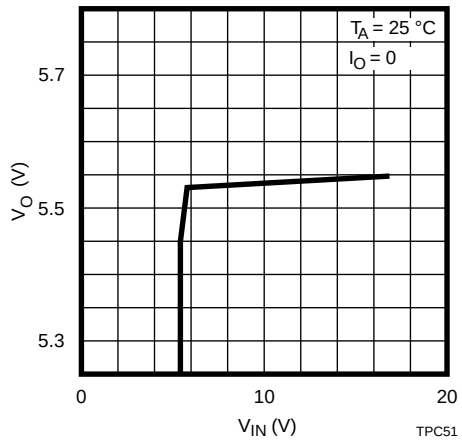
TPC49

DROPOUT VOLTAGE vs LOAD CURRENT



TPC50

OUTPUT VOLTAGE vs INPUT VOLTAGE

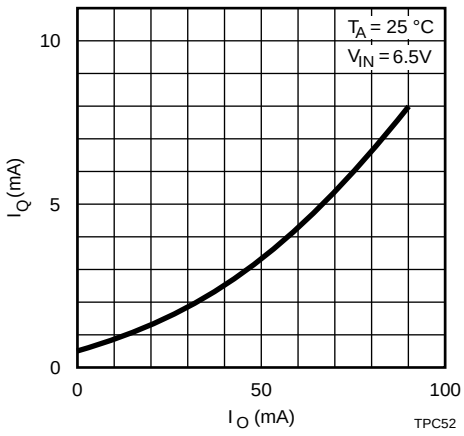


TPC51

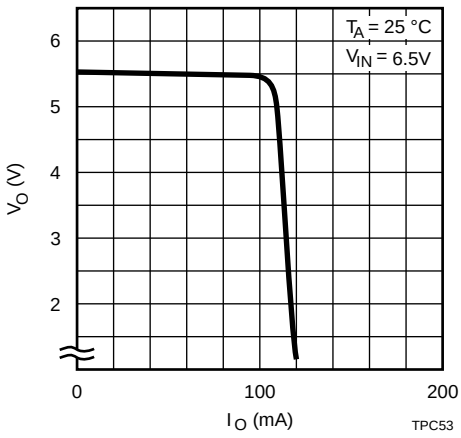
TYPICAL PERFORMANCE CHARACTERISTICS (CONT.)

TK11455 (CONT.)

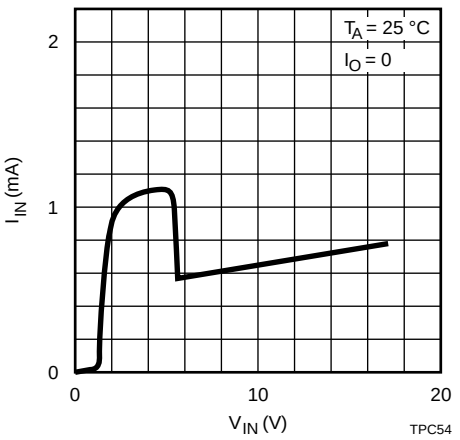
QUIESCENT CURRENT vs LOAD CURRENT



SHORT CIRCUIT PROTECTION

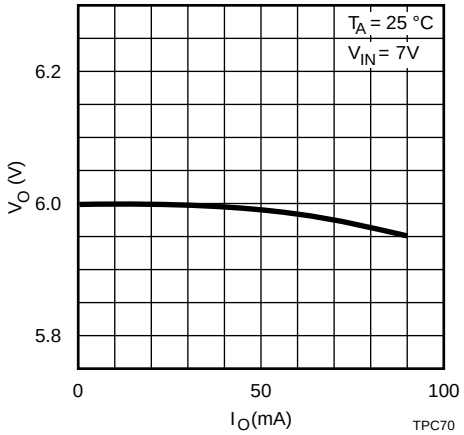


INPUT CURRENT vs INPUT VOLTAGE

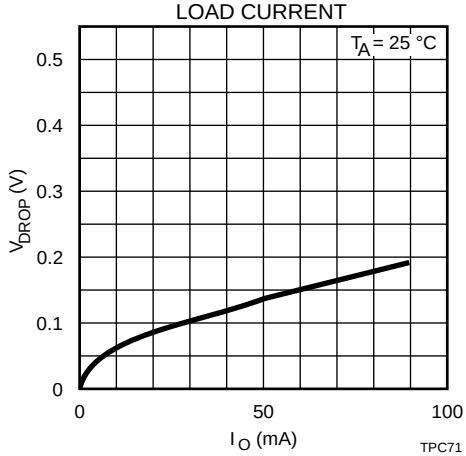


TK11460

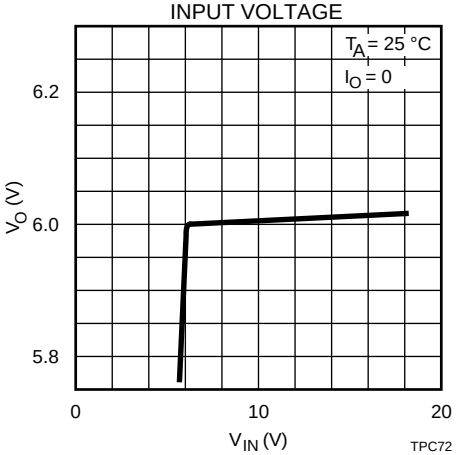
OUTPUT VOLTAGE vs OUTPUT CURRENT



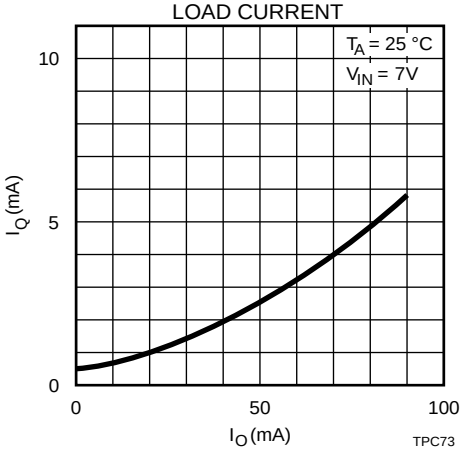
DROPOUT VOLTAGE vs LOAD CURRENT



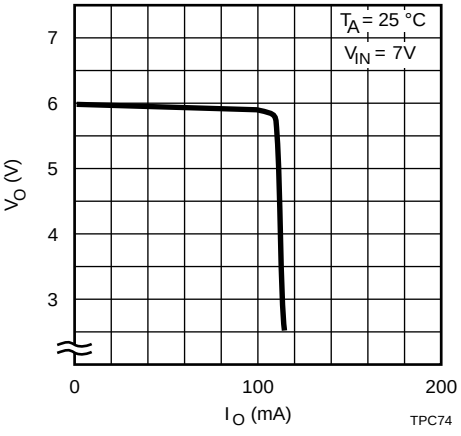
OUTPUT VOLTAGE vs INPUT VOLTAGE



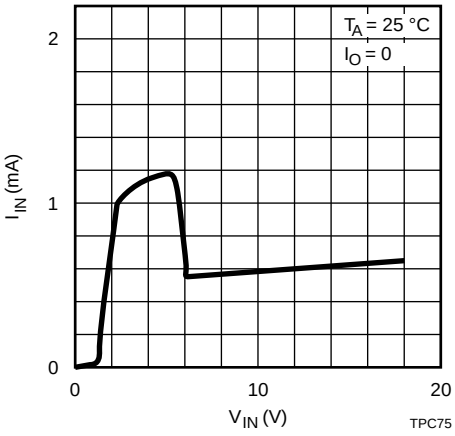
QUIESCENT CURRENT vs LOAD CURRENT



SHORT CIRCUIT PROTECTION



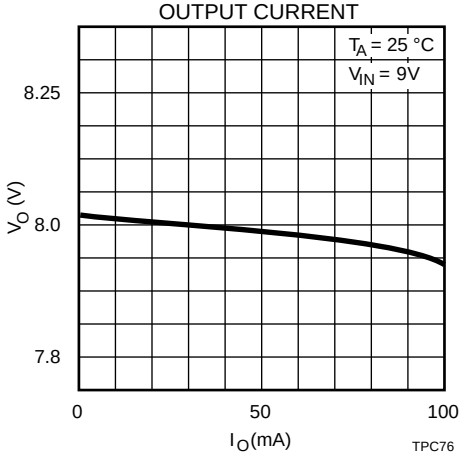
INPUT CURRENT vs INPUT VOLTAGE



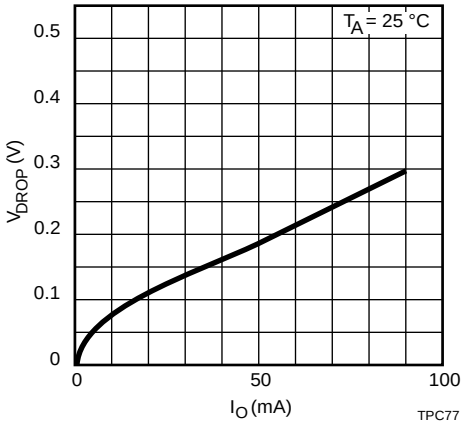
TYPICAL PERFORMANCE CHARACTERISTICS (CONT.)

TK11480

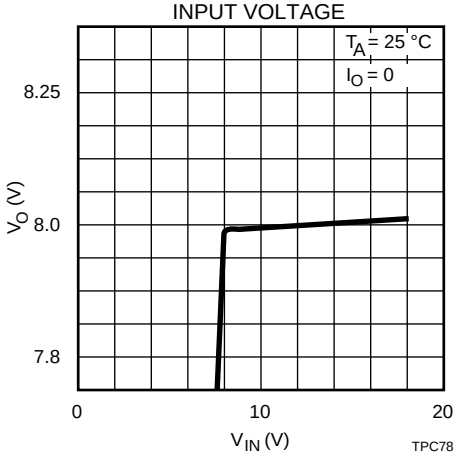
OUTPUT VOLTAGE vs OUTPUT CURRENT



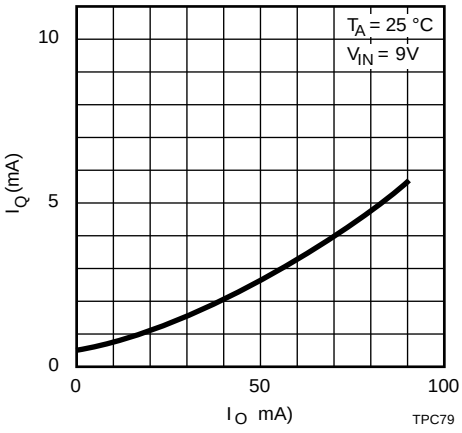
DROPOUT VOLTAGE vs LOAD CURRENT



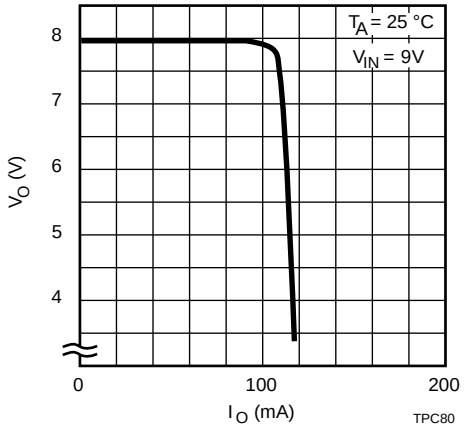
OUTPUT VOLTAGE vs INPUT VOLTAGE



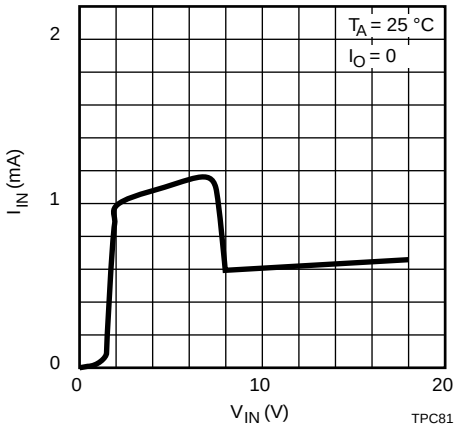
QUIESCENT CURRENT vs LOAD CURRENT



SHORT CIRCUIT PROTECTION

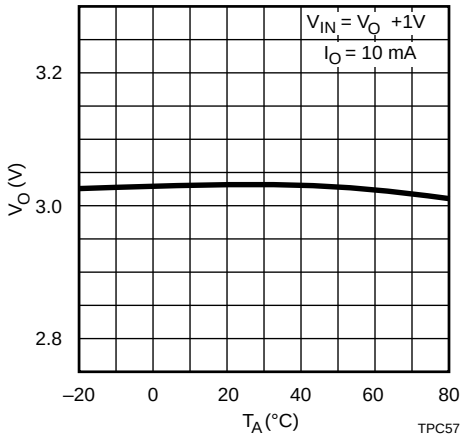


INPUT CURRENT vs INPUT VOLTAGE



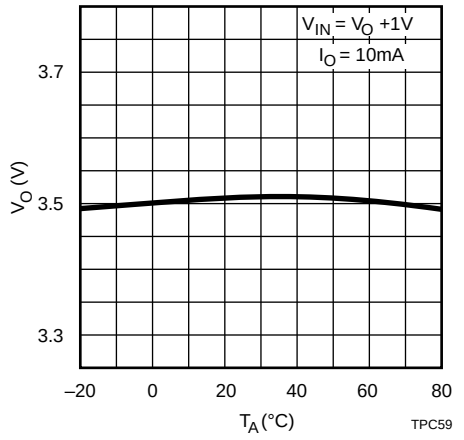
TK11430

OUTPUT VOLTAGE vs TEMPERATURE



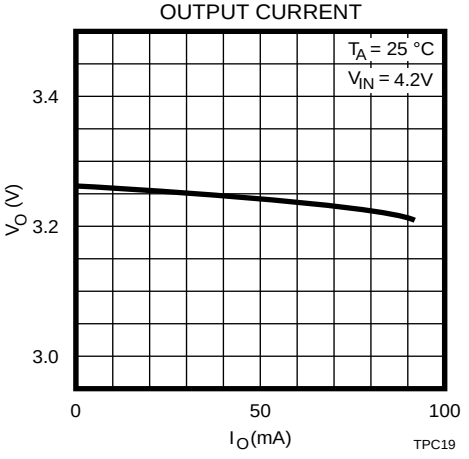
TK11435

OUTPUT VOLTAGE vs TEMPERATURE



TK11437

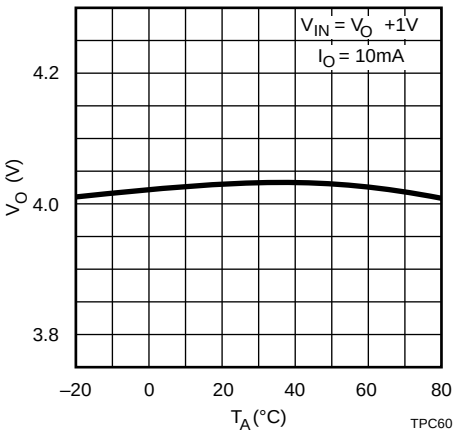
OUTPUT VOLTAGE vs OUTPUT CURRENT



TYPICAL PERFORMANCE CHARACTERISTICS (CONT.)

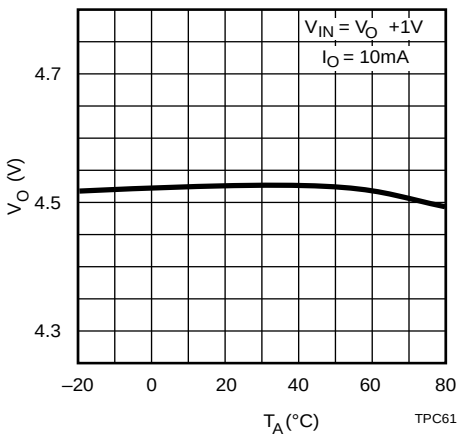
TK11440

OUTPUT VOLTAGE vs TEMPERATURE



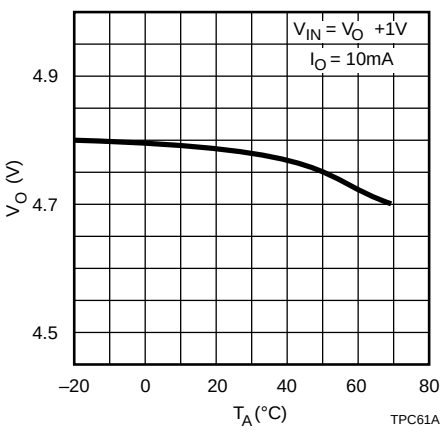
TK11445

OUTPUT VOLTAGE vs TEMPERATURE



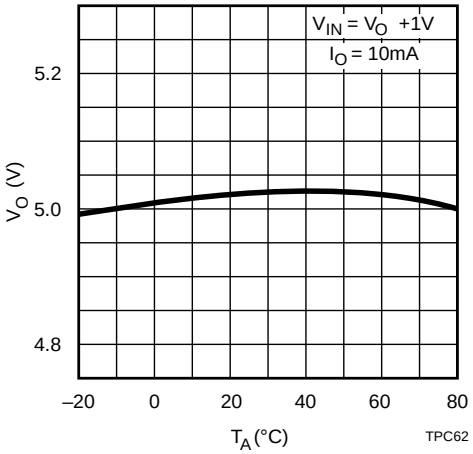
TK11447

OUTPUT VOLTAGE vs TEMPERATURE



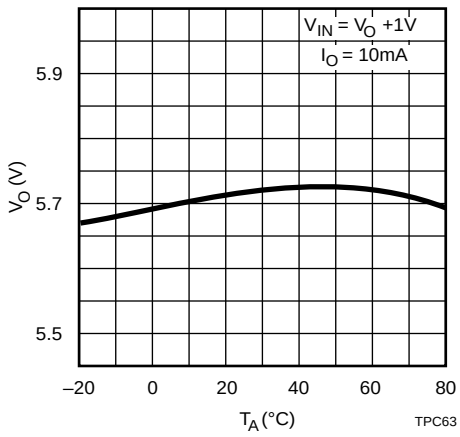
TK11450

OUTPUT VOLTAGE vs TEMPERATURE



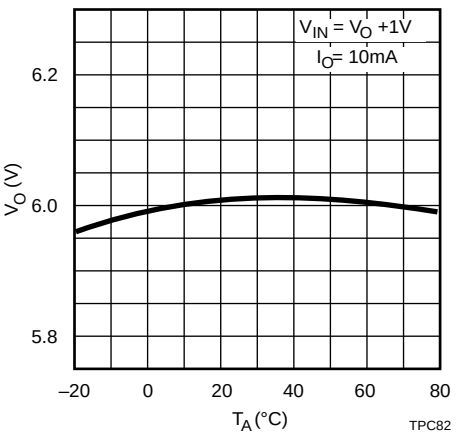
TK11457

OUTPUT VOLTAGE vs TEMPERATURE



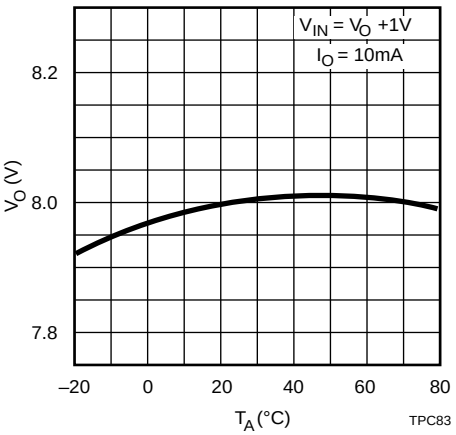
TK11460

OUTPUT VOLTAGE vs TEMPERATURE



TK11480

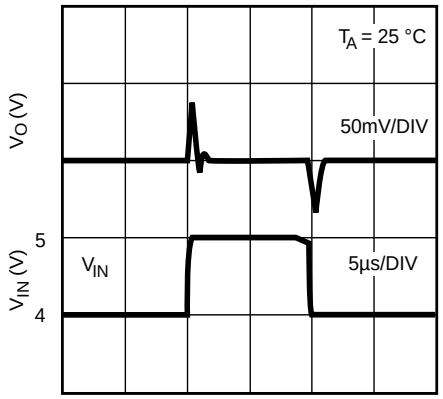
OUTPUT VOLTAGE vs TEMPERATURE



TYPICAL PERFORMANCE CHARACTERISTICS (CONT.)

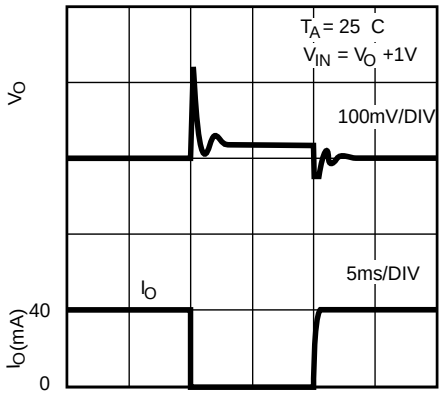
COMMON CHARACTERISTICS

LINE TRANSIENT RESPONSE



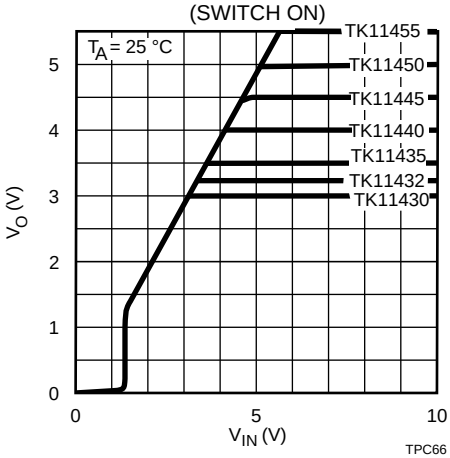
TPC64

LOAD TRANSIENT RESPONSE



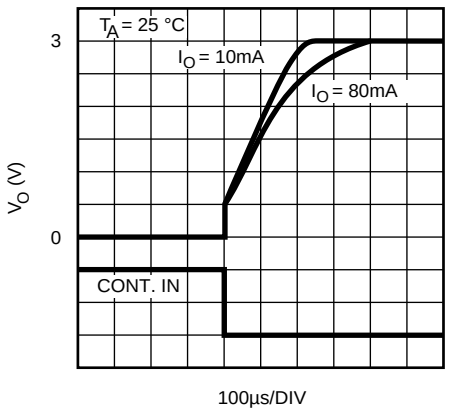
TPC65

INPUT OUTPUT CHARACTERISTICS (SWITCH ON)



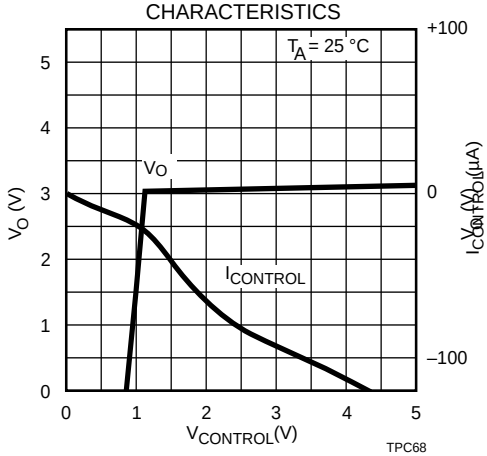
TPC66

TURN ON TRANSIENT RESPONSE



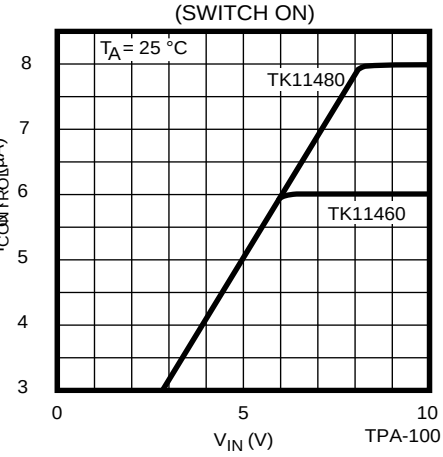
TPC67

CONTROL PIN CHARACTERISTICS



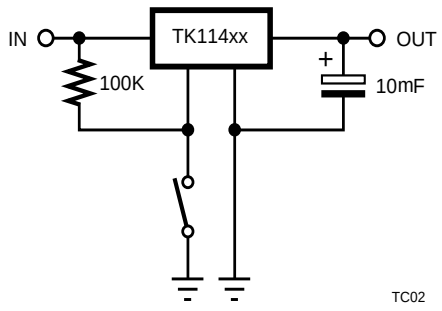
TPC68

INPUT OUTPUT CHARACTERISTICS (SWITCH ON)



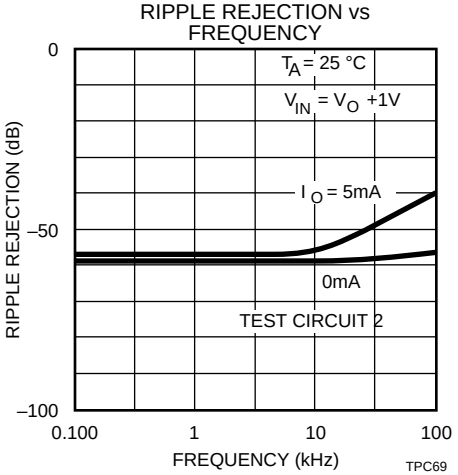
TPA-100

TEST CIRCUIT 2



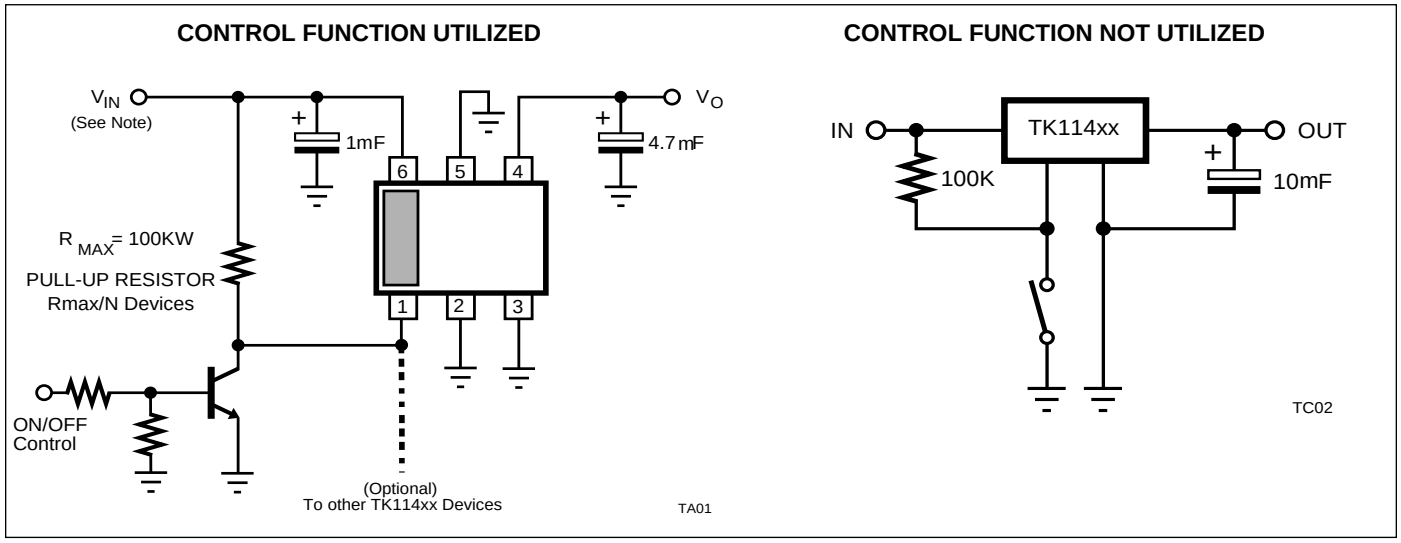
RIPPLE REJECTION TEST CIRCUIT

RIPPLE REJECTION vs FREQUENCY

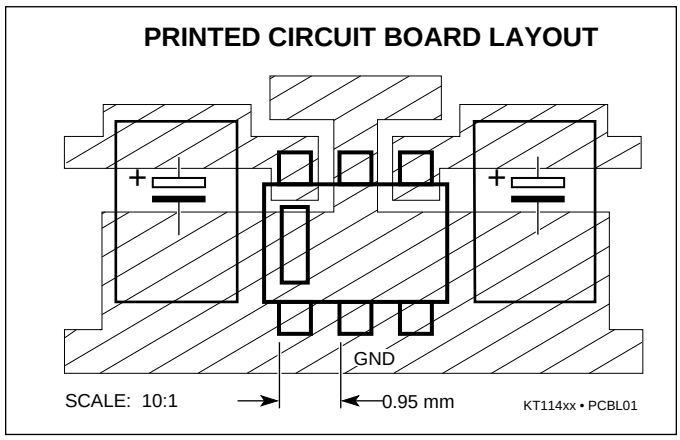


TPC69

TYPICAL APPLICATIONS



Note: Parallel connection of control pins is allowed if all devices use identical input voltage.



Application Hints

Maximize copper foil area connecting to all IC pins for optimum performance. Place input and output bypass capacitors close to the GND pin. For best transient behavior and lowest output impedance, use as large a capacitor value as possible. The temperature coefficient of the capacitance and Equivalent Series Resistance (ESR) should be taken into account. These parameters can influence power supply noise and ripple rejection. In extreme cases, oscillation may occur. In order to maintain stability, the output bypass capacitor value should be minimum 2.2 µF for a Tantalum electrolytic or 4.7 µF for an Aluminum electrolytic.

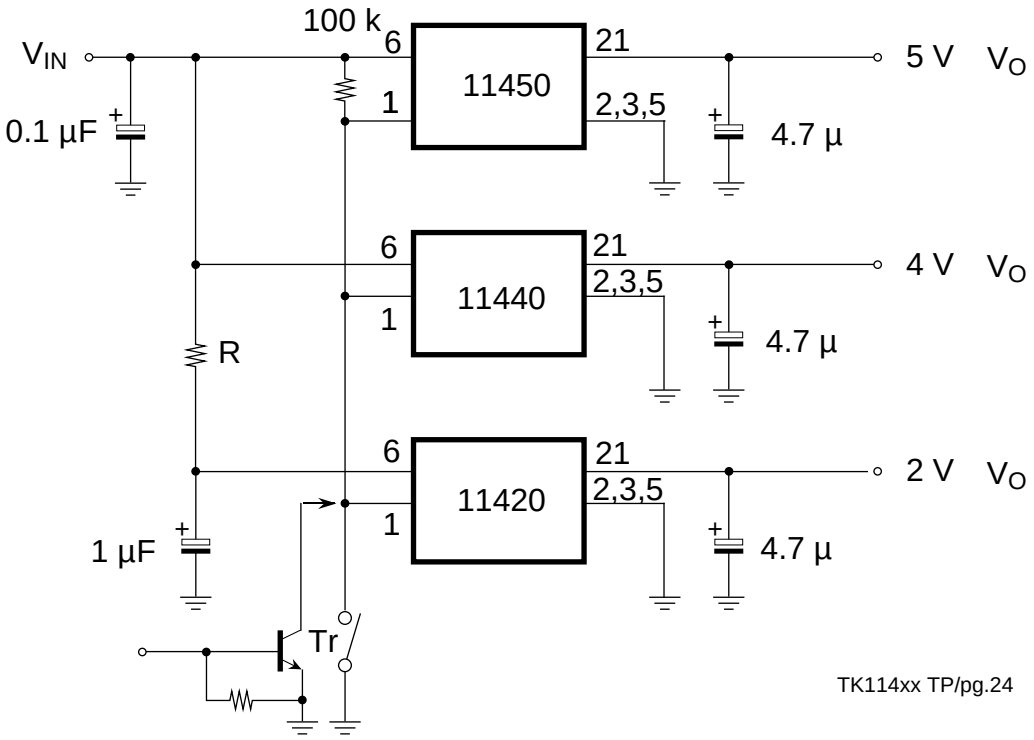
Handling Molded Resin Packages

All plastic molded packages absorb some moisture from the air. If moisture absorption occurs prior to soldering the device into the printed circuit board, increased separation of the lead from the plastic molding may occur, degrading the moisture barrier characteristics of the device.

This property of plastic molding compounds should not be overlooked, particularly in the case of very small packages, where the plastic is very thin.

In order to preserve the original moisture barrier properties of the package, devices are stored and shipped in moisture proof bags, filled with dry air. The bags should not be opened or damaged prior to the actual use of the devices. If this is unavoidable, the devices should be stored in a low relative humidity environment (40 to 65%) or in an enclosed environment with desiccant.

TYPICAL APPLICATIONS (CONT.)



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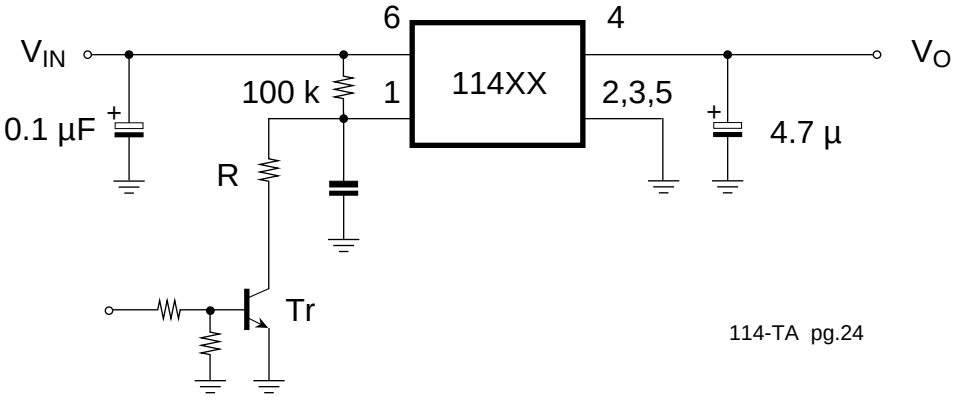

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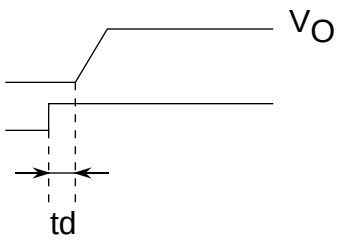
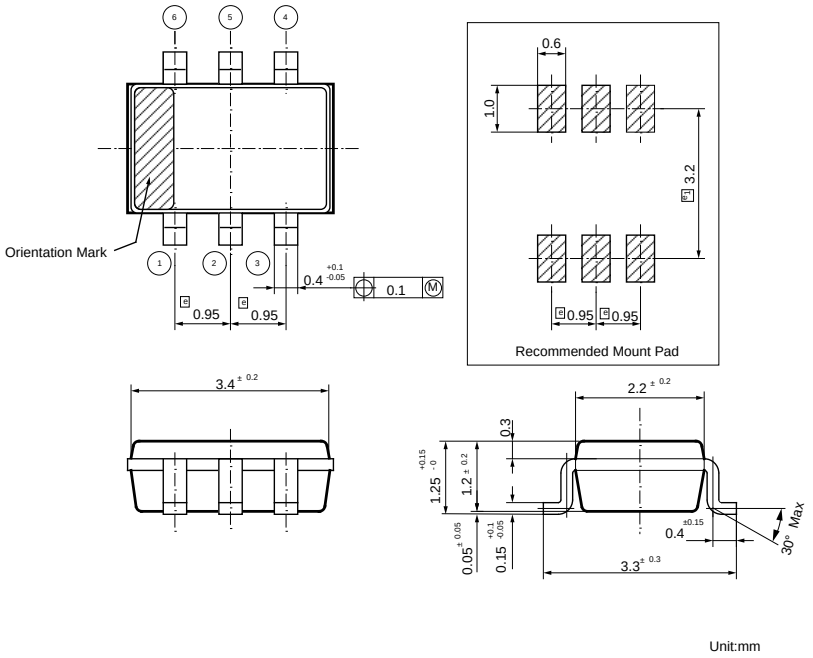


PACKAGE OUTLINE

SOT-23L



Unit:mm

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