

DC-DC CONVERTER

FEATURES

- Very Small Size
- Few External Components
- Wide Input Supply Voltage Range (1.1 to 18 V)
- Six Selectable Output Voltages up to 32 V
- Single Battery Cell Operation

DESCRIPTION

The TK11806 is a low power, low input voltage DC-DC converter.

The device has been optimized for variable capacitance diode and PIN diode bias applications. It generates DC output voltages ranging from 9.3 V to 32 V in six steps. The desired output voltage may be selected by simple wire connections between control pins. The input DC voltage can be as low as 1.1 V or as high as 18 V.

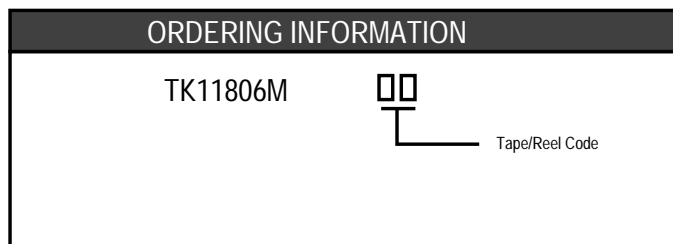
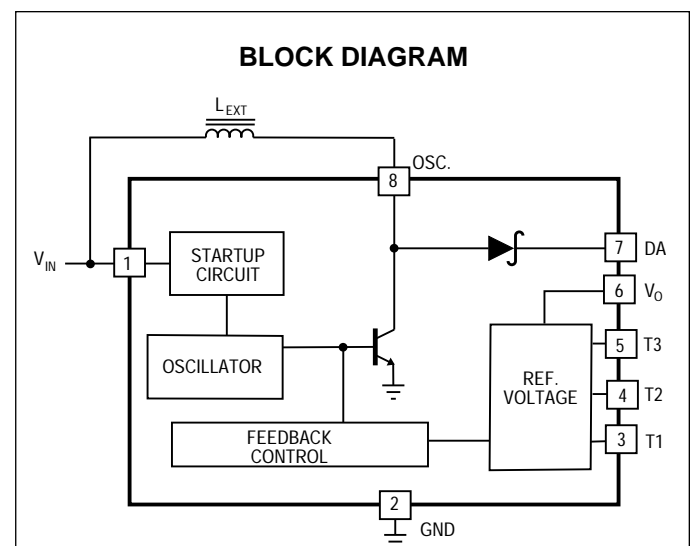
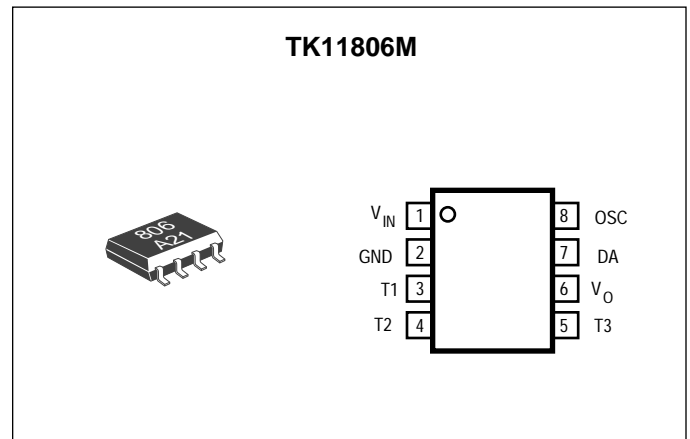
The device has a built-in relaxation oscillator. The frequency of oscillation is determined by external component values. The TK11806 has built-in voltage reference and an array of temperature compensated zener diodes in order to generate various output voltages with minimum external part count.

The device is available in an 8-lead plastic surface mount package (MFP-8).

External inductive components are also available from TOKO.

APPLICATIONS

- Variable Capacitance and PIN Diode Bias
- Portable Instrumentation
- Radio Control Systems
- Mobile Radios
- Cellular Telephones
- Cordless Telephones
- Fiberoptic Receivers
- Local Area Network (LAN) Receivers
- Battery Operated Equipment



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

TK11806

ABSOLUTE MAXIMUM RATINGS

Input Voltage 20 V
 Output Voltage 35 V
 Power Dissipation (Note 1) 350 mW
 Junction Temperature 150 °C

Storage Temperature Range -55 to +150 °C
 Operating Temperature Range -20 to +70 °C
 Lead Soldering Temp. (10 sec.) M-Package 260 °C

ELECTRICAL CHARACTERISTICS

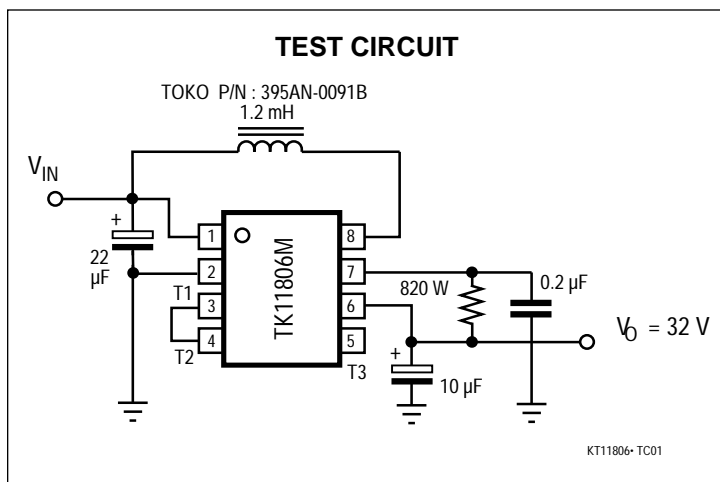
Test conditions: $V_{IN} = 5.0\text{ V}$, $V_O = 32.0\text{ V}$, $T_A = 25\text{ °C}$, $I_O = 0\text{ }\mu\text{A}$, unless otherwise specified.

SYMBOL	PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNITS
V_{IN}	Supply Voltage Range		1.1		18	mA
I_{IN}	Supply Current	$I_O = 0.1\text{ mA}$		4.7	90	mA
		$I_O = 0.1\text{ mA}$		12.1	19	μA
V_{O1}	Output Voltage	$1.1\text{ V} \leq V_{IN} \leq 18.0\text{ V}$, Note 2	30	32.0	34	V
V_{O2}	Output Voltage	$1.1\text{ V} \leq V_{IN} \leq 18.0\text{ V}$, Note 2	26	28	30	V
V_{O3}	Output Voltage	$1.1\text{ V} \leq V_{IN} \leq 18.0\text{ V}$, Note 2	22.0	24.0	26.0	V
V_{O4}	Output Voltage	$1.1\text{ V} \leq V_{IN} \leq 18.0\text{ V}$, Note 2	15.5	16.8	18.0	V
V_{O5}	Output Voltage	$1.1\text{ V} \leq V_{IN} \leq 18.0\text{ V}$, Note 2	11.0	12.8	14.5	V
V_{O6}	Output Voltage	$1.1\text{ V} \leq V_{IN} \leq 18.0\text{ V}$, Note 2	8.0	9.3	10.5	V
I_O	Output Current	Note 3	1.8	2.4		mA
Load Reg	Load Regulation	$I_O = 0.0\text{ mA} \rightarrow 1.0\text{ mA}$.24	0.5	%
$\Delta V_O / \Delta T_A$	Output Voltage Temperature Dependency	$I_O = 0.1\text{ mA}$		0.25		mV/ °C
V_{OSC}	Oscillator Start-up Voltage	$I_O = 0\text{ mA}$		0.9	1.1	V

Note 1: Power dissipation must be derated at the rate of 3 mW/°C for operation at $T_A = 25\text{ °C}$ and above.

Note 2: Connect T_1 through T_3 as specified.

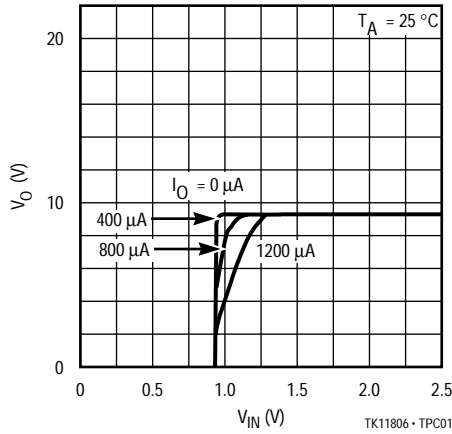
Note 3: Use inductor as specified.



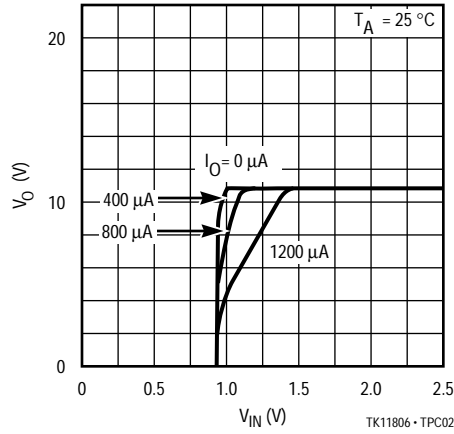
OUTPUT VOLTAGE (V)	CONNECTION
32	$T_1 - T_2$
28	$T_1 - T_3$
24	$T_1 - T_2 - T_3$
17	$T_1 - T_2, T_3 - V_O$
13	$T_1 - V_O$
9.3	$T_1 - T_2 - V_O$

TYPICAL PERFORMANCE CHARACTERISTICS

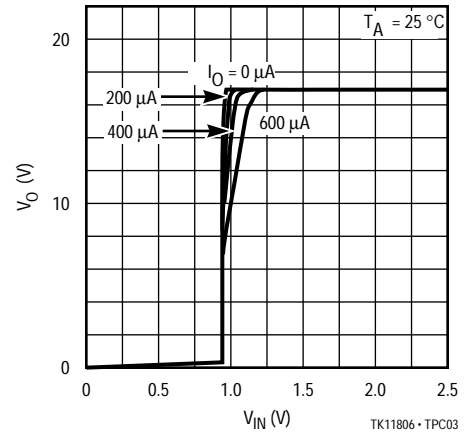
OUTPUT VOLTAGE vs. INPUT VOLTAGE
 $V_O = 9.3\text{ V}$



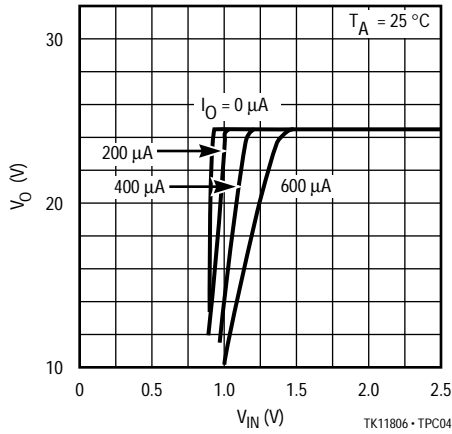
OUTPUT VOLTAGE vs. INPUT VOLTAGE
 $V_O = 13\text{ V}$



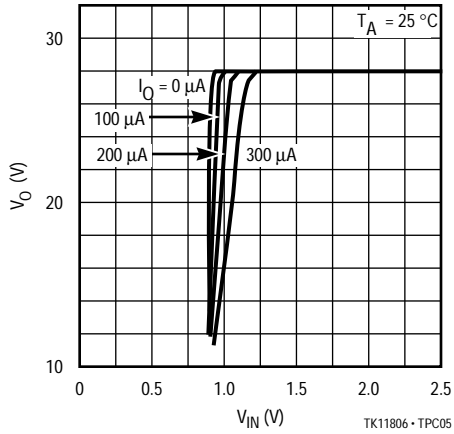
OUTPUT VOLTAGE vs. INPUT VOLTAGE
 $V_O = 17\text{ V}$



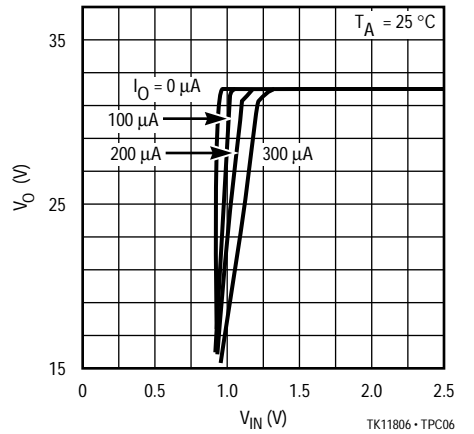
OUTPUT VOLTAGE vs. INPUT VOLTAGE
 $V_O = 24\text{ V}$



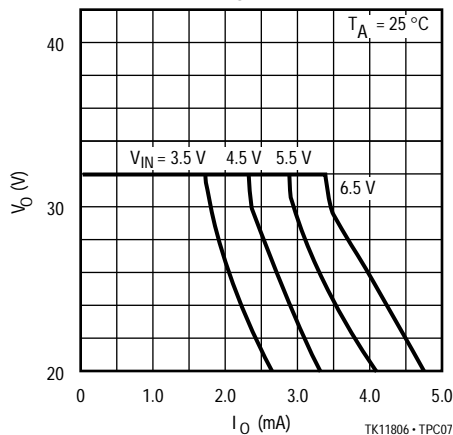
OUTPUT VOLTAGE vs. INPUT VOLTAGE
 $V_O = 28\text{ V}$



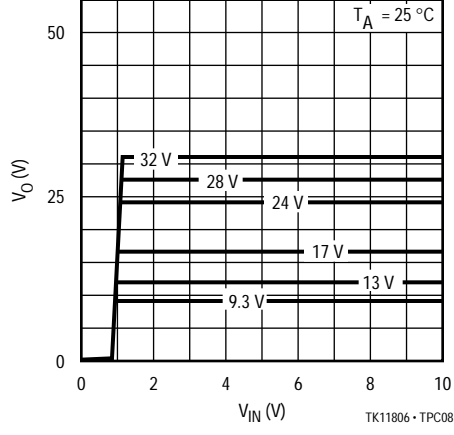
OUTPUT VOLTAGE vs. INPUT VOLTAGE
 $V_O = 32\text{ V}$



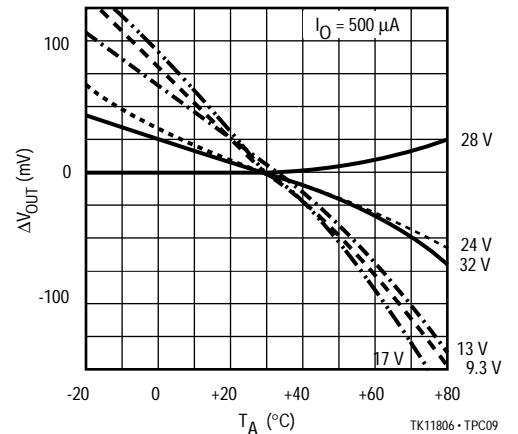
OUTPUT VOLTAGE vs. OUTPUT CURRENT
 $V_O = 32\text{ V}$



OUTPUT VOLTAGE vs. INPUT VOLTAGE

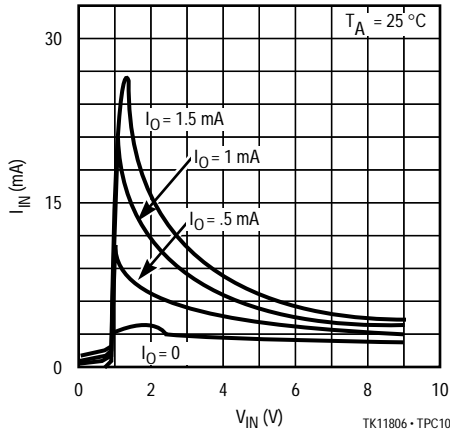


OUTPUT VOLTAGE DRIFT vs. TEMPERATURE

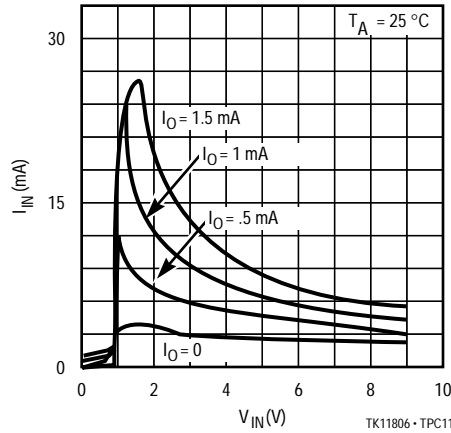


TYPICAL PERFORMANCE CHARACTERISTICS

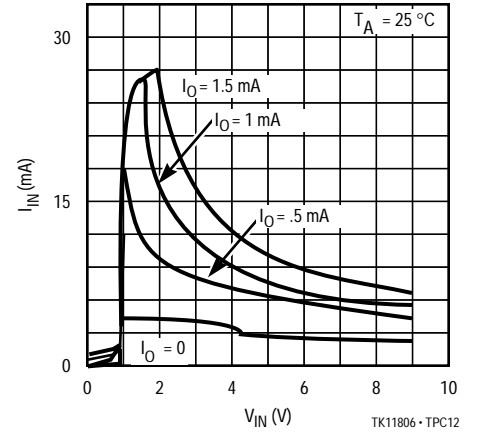
INPUT CURRENT vs. INPUT VOLTAGE
 $V_O = 9.3\text{ V}$



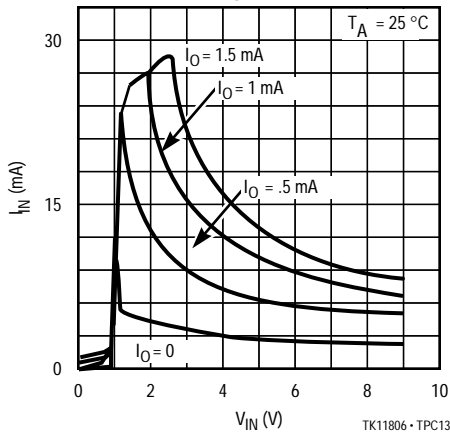
INPUT CURRENT vs. INPUT VOLTAGE
 $V_O = 13\text{ V}$



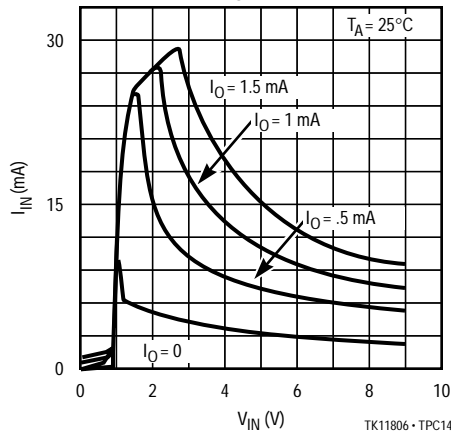
INPUT CURRENT vs. INPUT VOLTAGE
 $V_O = 17\text{ V}$



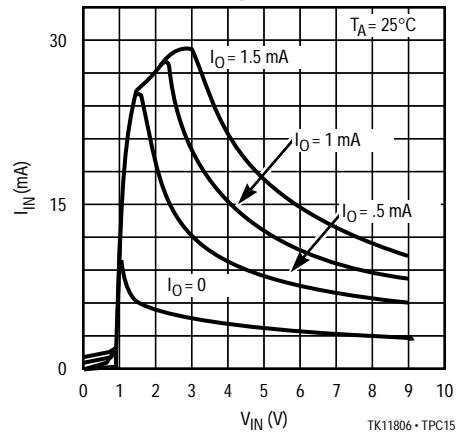
INPUT CURRENT vs. INPUT VOLTAGE
 $V_O = 24\text{ V}$



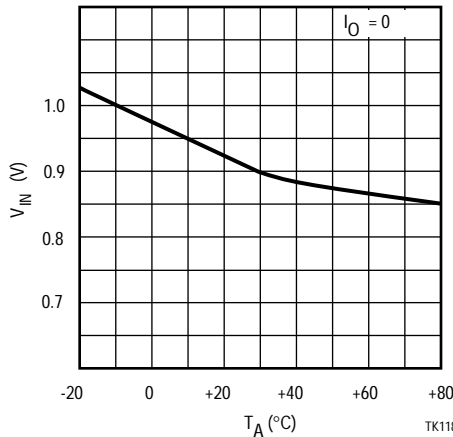
INPUT CURRENT vs. INPUT VOLTAGE
 $V_O = 28\text{ V}$



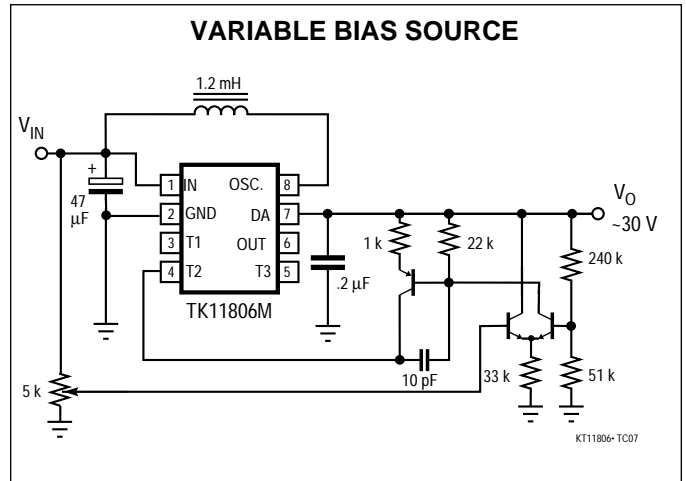
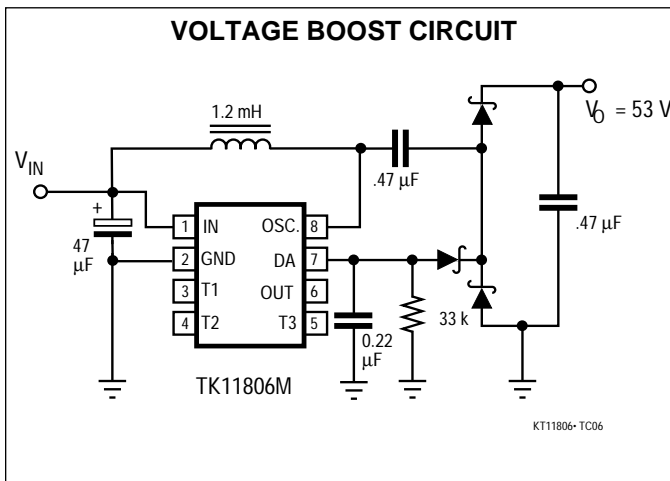
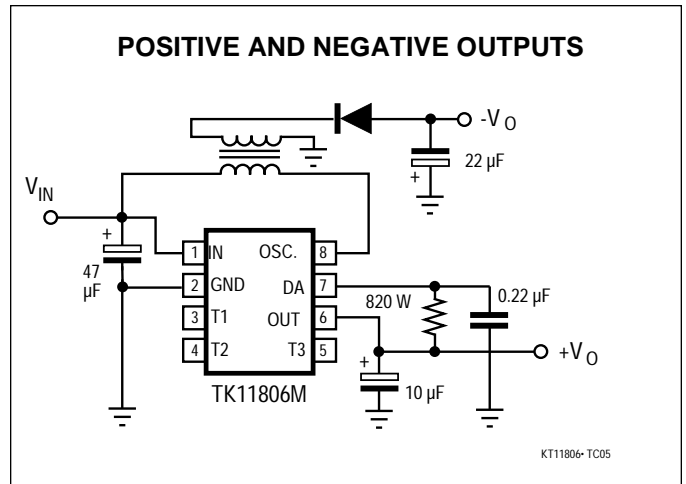
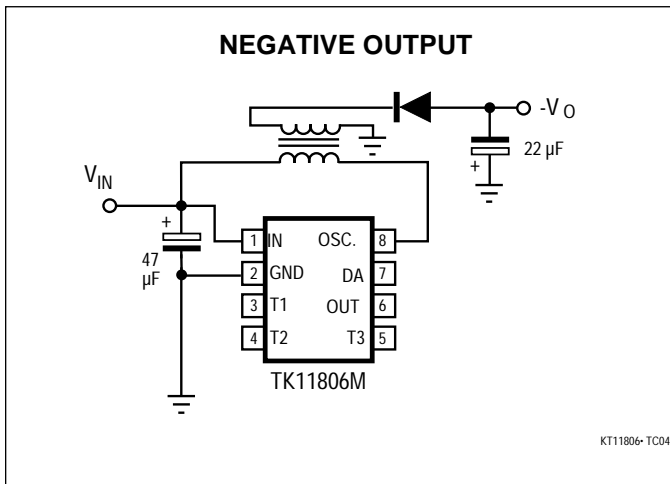
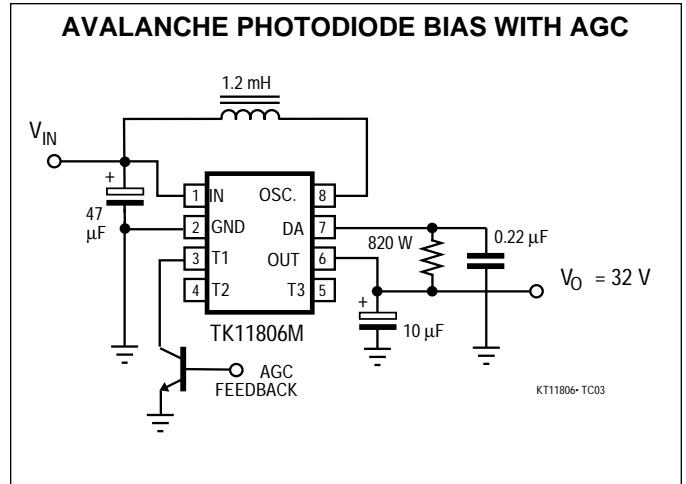
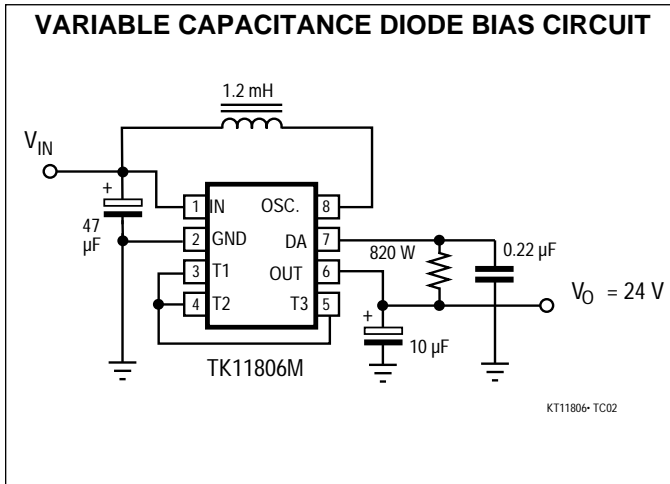
INPUT CURRENT vs. INPUT VOLTAGE
 $V_O = 28\text{ V}$



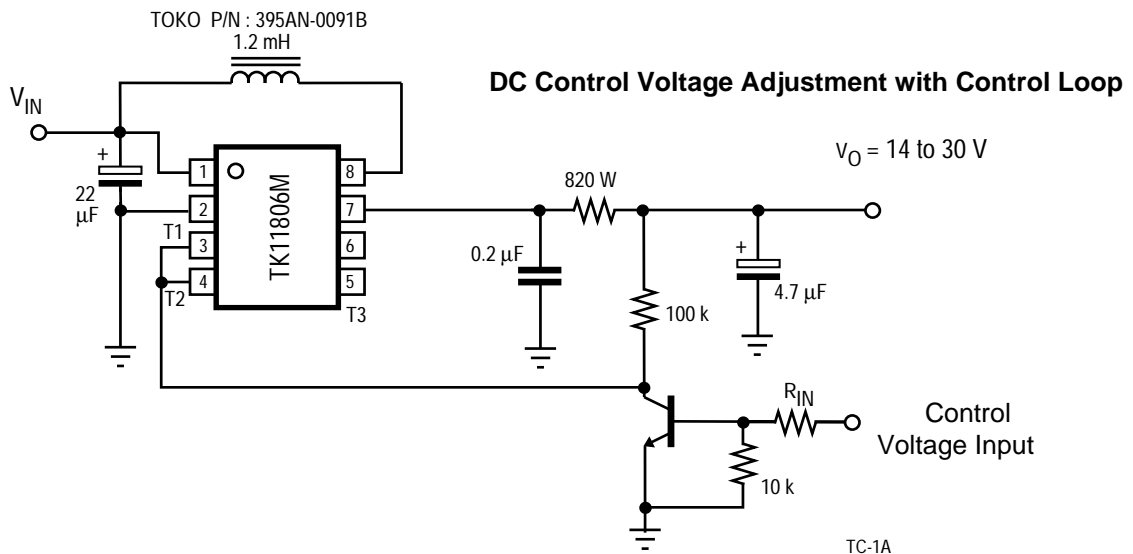
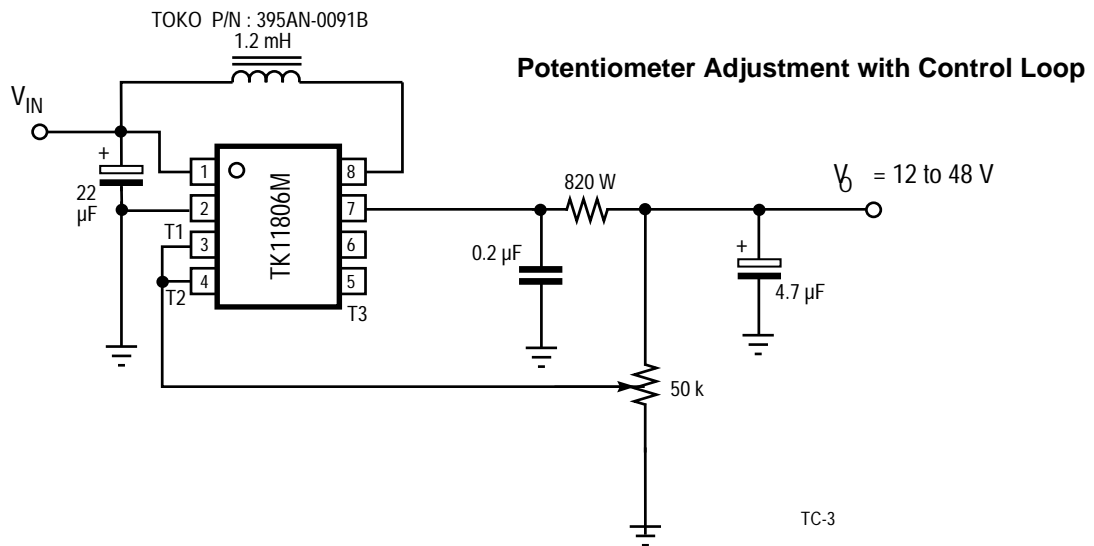
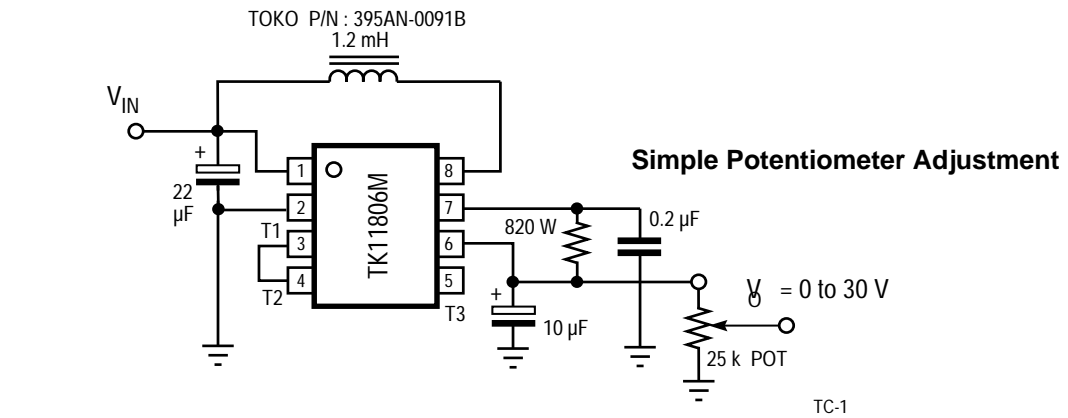
OSCILLATOR START-UP VOLTAGE
 vs. TEMPERATURE



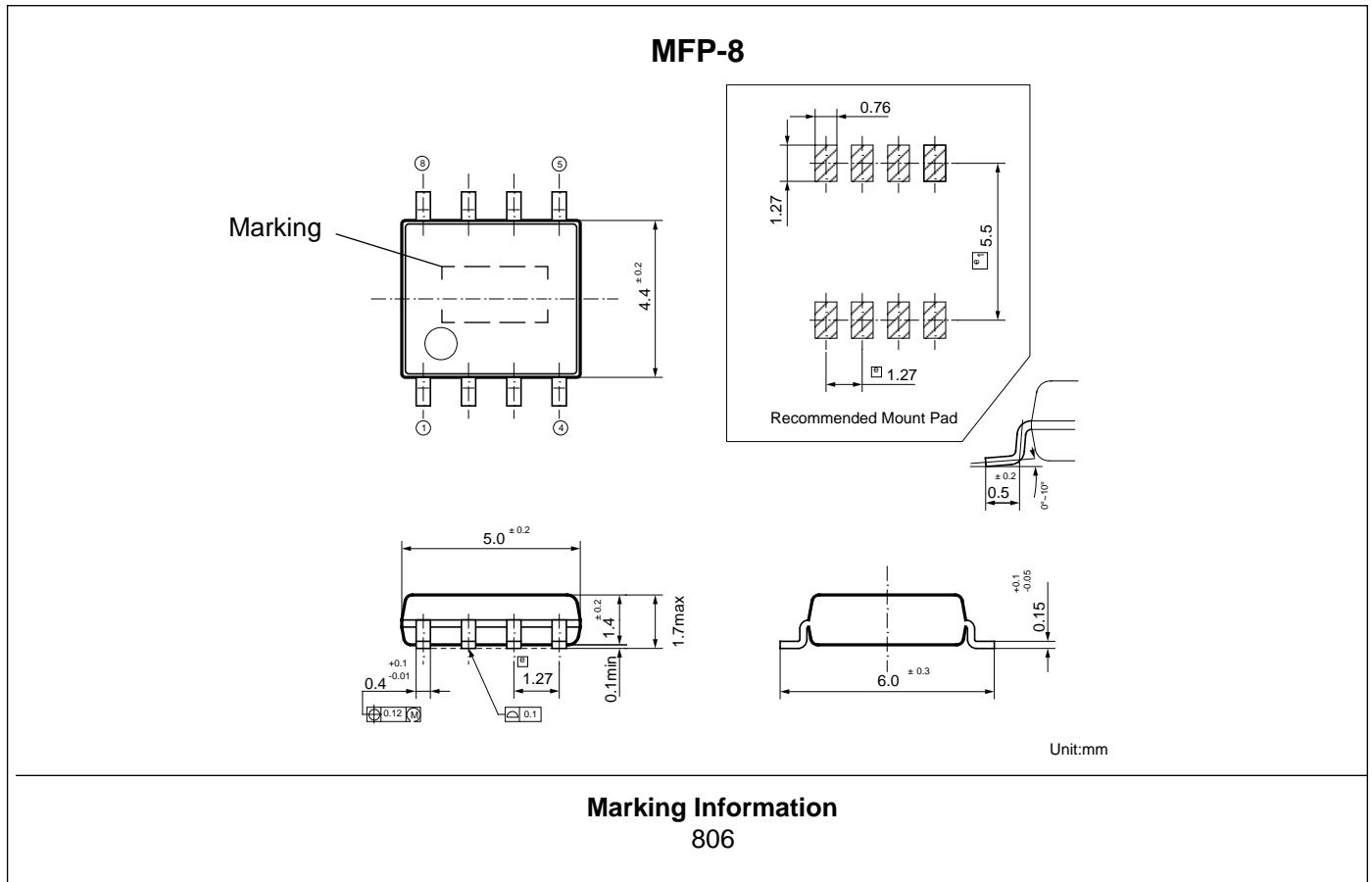
TYPICAL APPLICATIONS



METHODS FOR VARIABLE OUTPUT CONTROL



PACKAGE OUTLINES



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