

### 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.

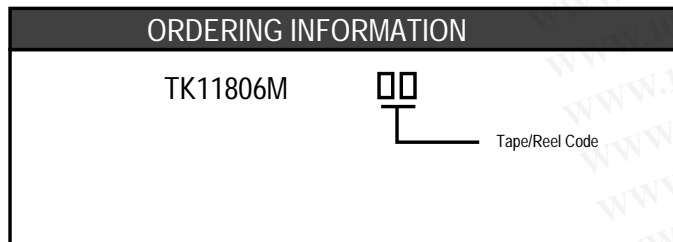
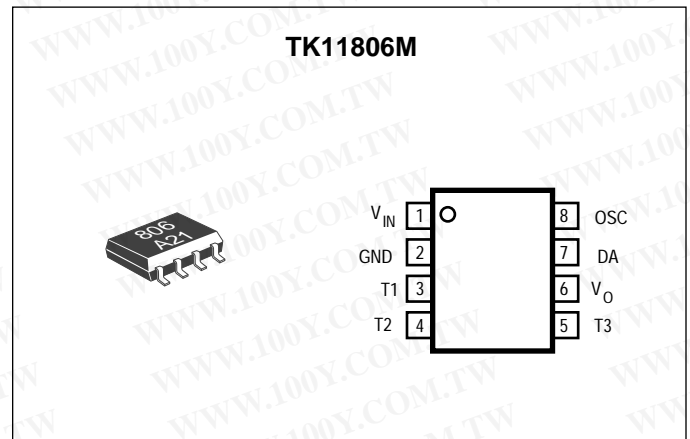
The device has a built-in relaxation oscillator. The frequency of oscillation is determined by external component values. The TK11806 has built-in voltage reference and an array of temperature compensated zener diodes in order to generate various output voltages with minimum external part count.

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

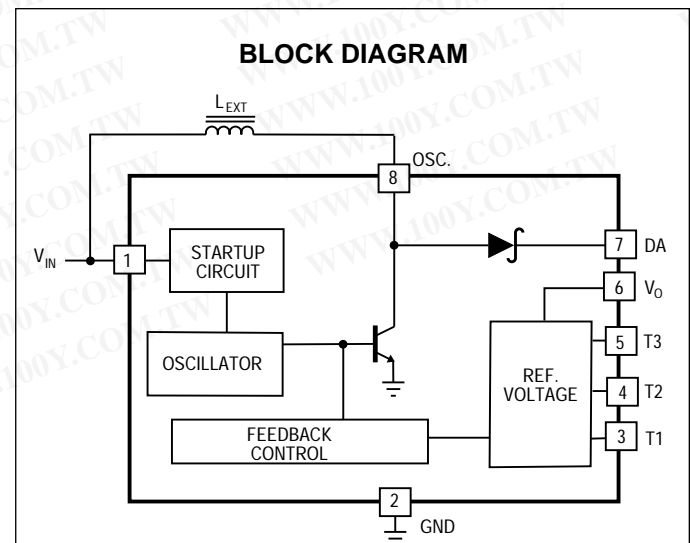
External inductive components are also available from TOKO.

#### 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	Storage Temperature Range .....	-55 to +150 °C
Output Voltage .....	35 V	Operating Temperature Range .....	-20 to +70 °C
Power Dissipation (Note 1) .....	350 mW	Lead Soldering Temp. (10 sec.) M-Package .....	260 °C
Junction Temperature .....	150 °C		

## ELECTRICAL CHARACTERISTICS

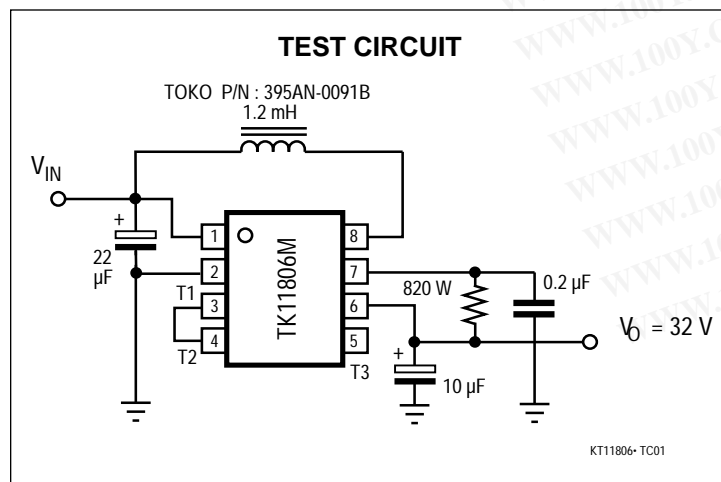
Test conditions:  $V_{IN} = 5.0 V$ ,  $V_O = 32.0 V$ ,  $T_A = 25 °C$ ,  $I_O = 0 \mu A$ , unless otherwise specified.

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

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

Note 2: Connect  $T_1$  through  $T_3$  as specified.

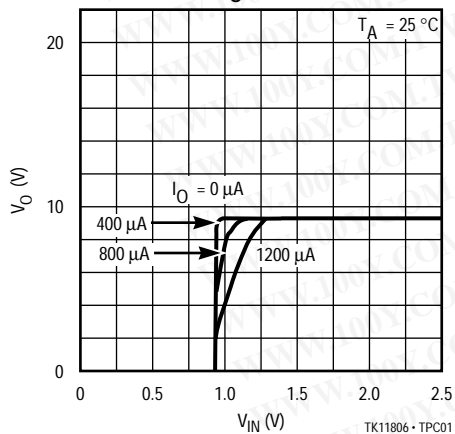
Note 3: Use inductor as specified.



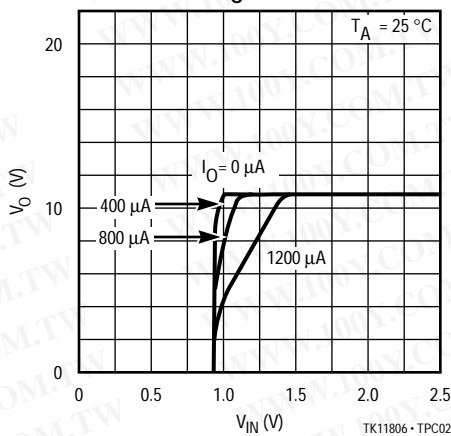
OUTPUT VOLTAGE (V)	CONNECTION
32	$T_1 - T_2$
28	$T_1 - T_3$
24	$T_1 - T_2 - T_3$
17	$T_1 - T_2, T_3 - V_O$
13	$T_1 - V_O$
9.3	$T_1 - T_2 - V_O$

TYPICAL PERFORMANCE CHARACTERISTICS

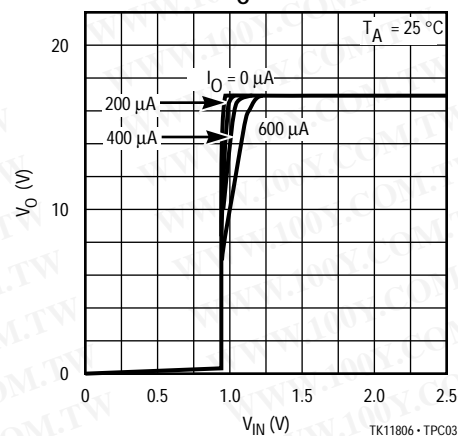
OUTPUT VOLTAGE vs. INPUT VOLTAGE  
 $V_O = 9.3\text{ V}$



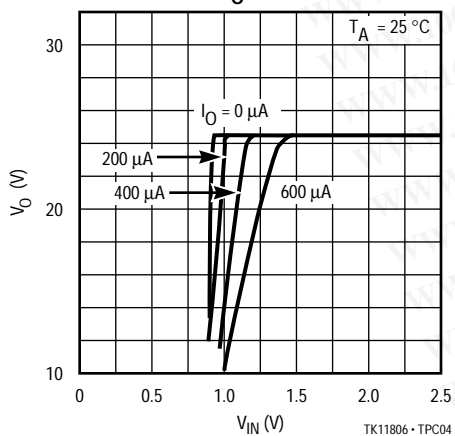
OUTPUT VOLTAGE vs. INPUT VOLTAGE  
 $V_O = 13\text{ V}$



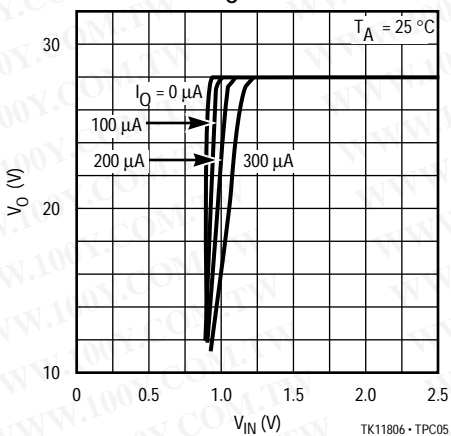
OUTPUT VOLTAGE vs. INPUT VOLTAGE  
 $V_O = 17\text{ V}$



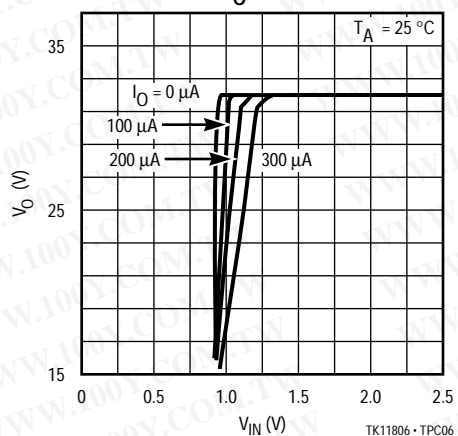
OUTPUT VOLTAGE vs. INPUT VOLTAGE  
 $V_O = 24\text{ V}$



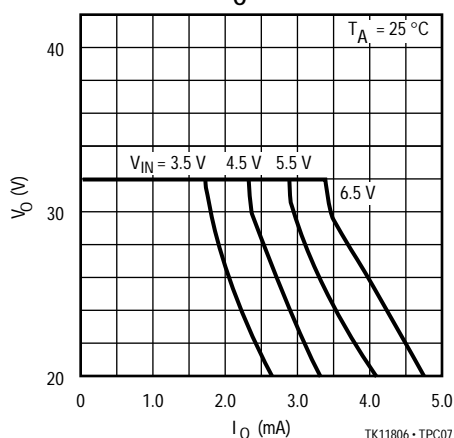
OUTPUT VOLTAGE vs. INPUT VOLTAGE  
 $V_O = 28\text{ V}$



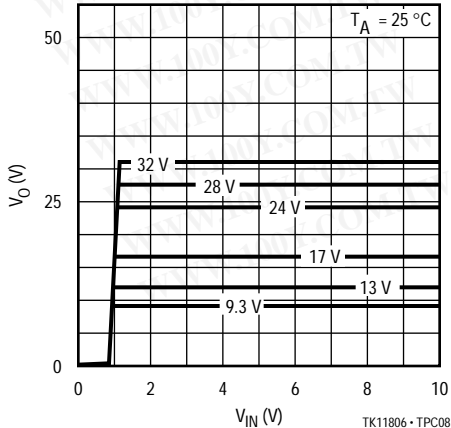
OUTPUT VOLTAGE vs. INPUT VOLTAGE  
 $V_O = 32\text{ V}$



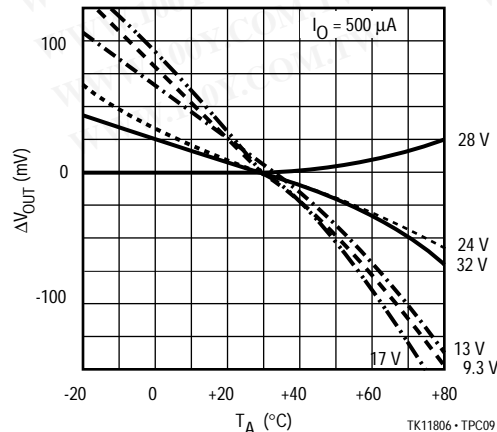
OUTPUT VOLTAGE vs. OUTPUT CURRENT  
 $V_O = 32\text{ V}$



OUTPUT VOLTAGE vs. INPUT VOLTAGE

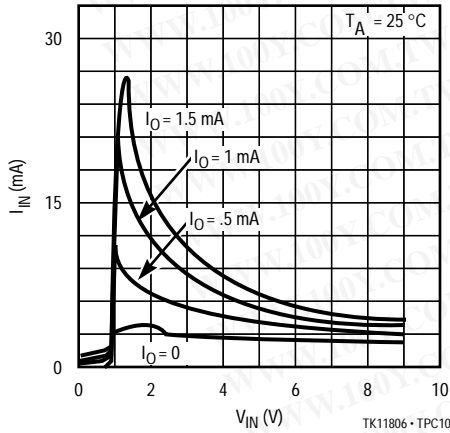


OUTPUT VOLTAGE DRIFT vs. TEMPERATURE

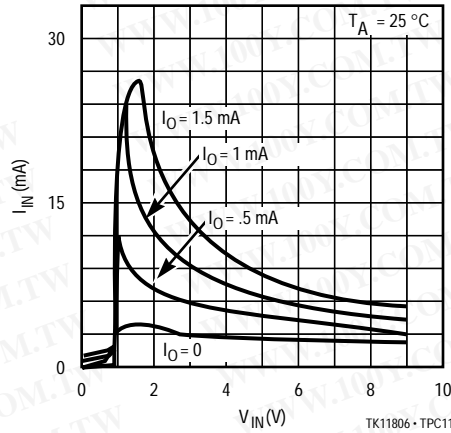


TYPICAL PERFORMANCE CHARACTERISTICS

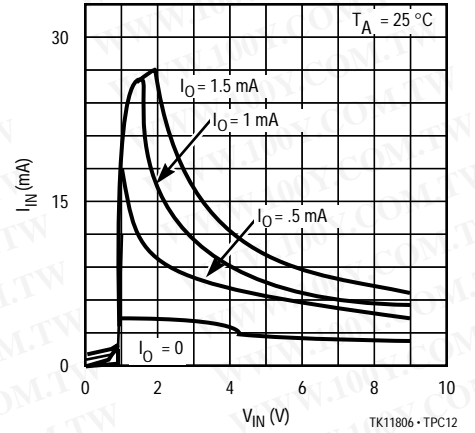
INPUT CURRENT vs. INPUT VOLTAGE  
 $V_O = 9.3\text{ V}$



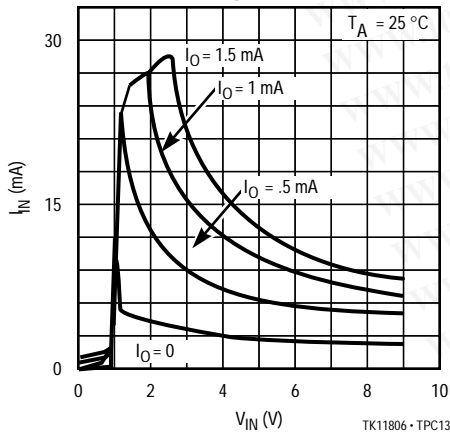
INPUT CURRENT vs. INPUT VOLTAGE  
 $V_O = 13\text{ V}$



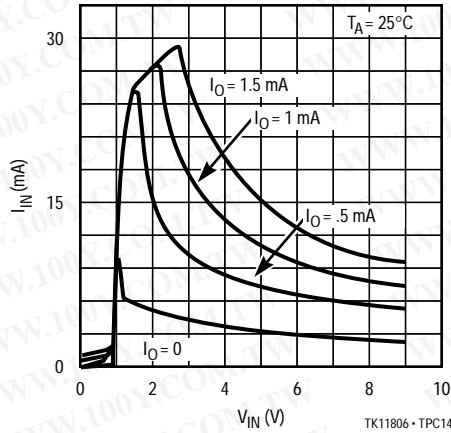
INPUT CURRENT vs. INPUT VOLTAGE  
 $V_O = 17\text{ V}$



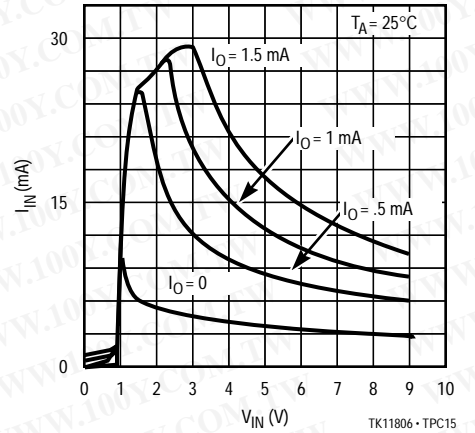
INPUT CURRENT vs. INPUT VOLTAGE  
 $V_O = 24\text{ V}$



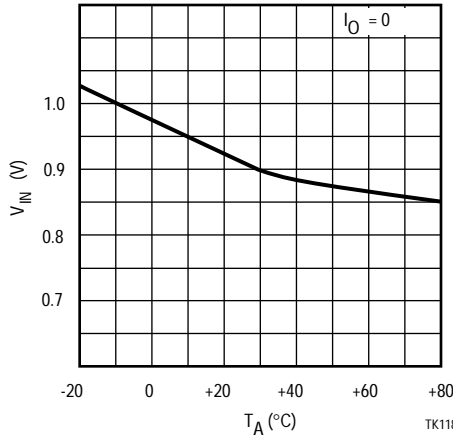
INPUT CURRENT vs. INPUT VOLTAGE  
 $V_O = 28\text{ V}$



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

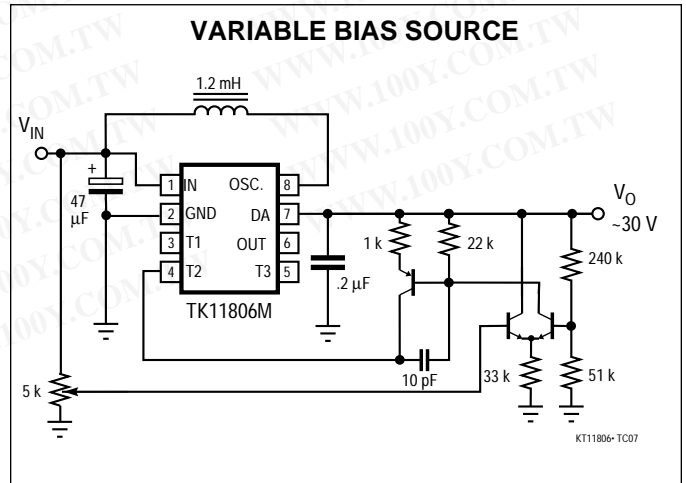
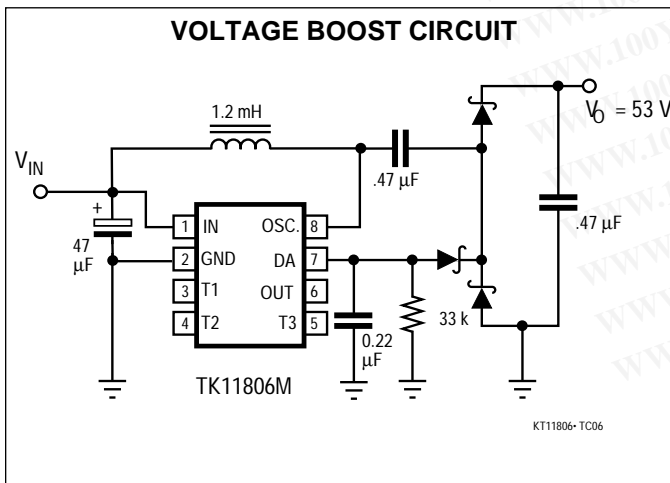
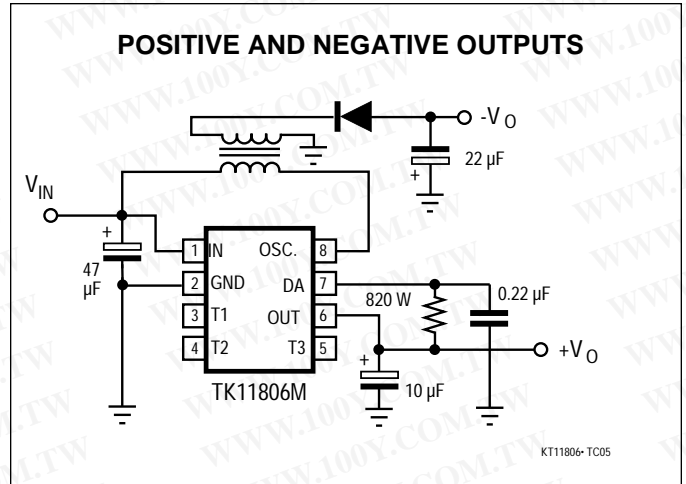
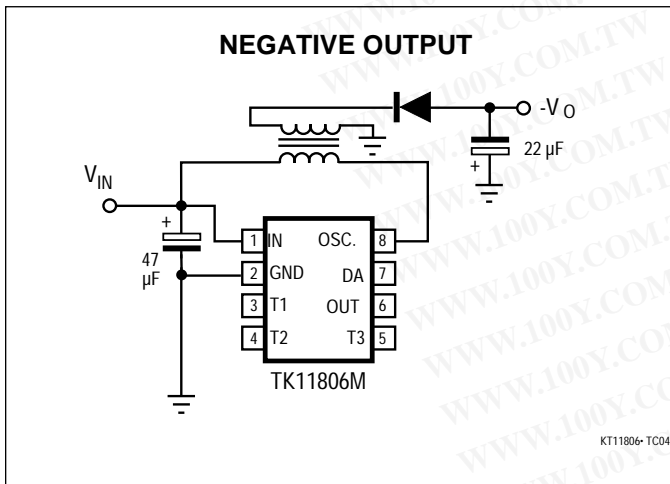
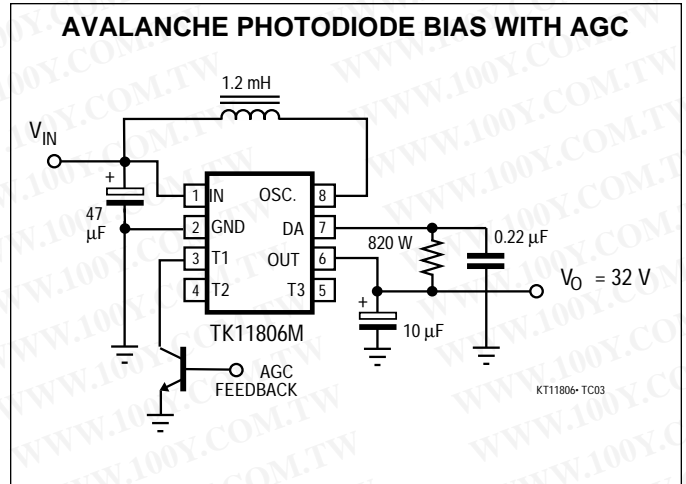
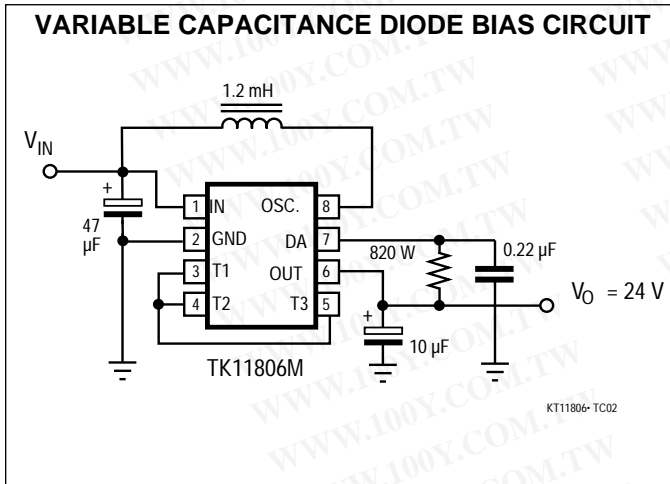


OSCILLATOR START-UP VOLTAGE  
 vs. TEMPERATURE

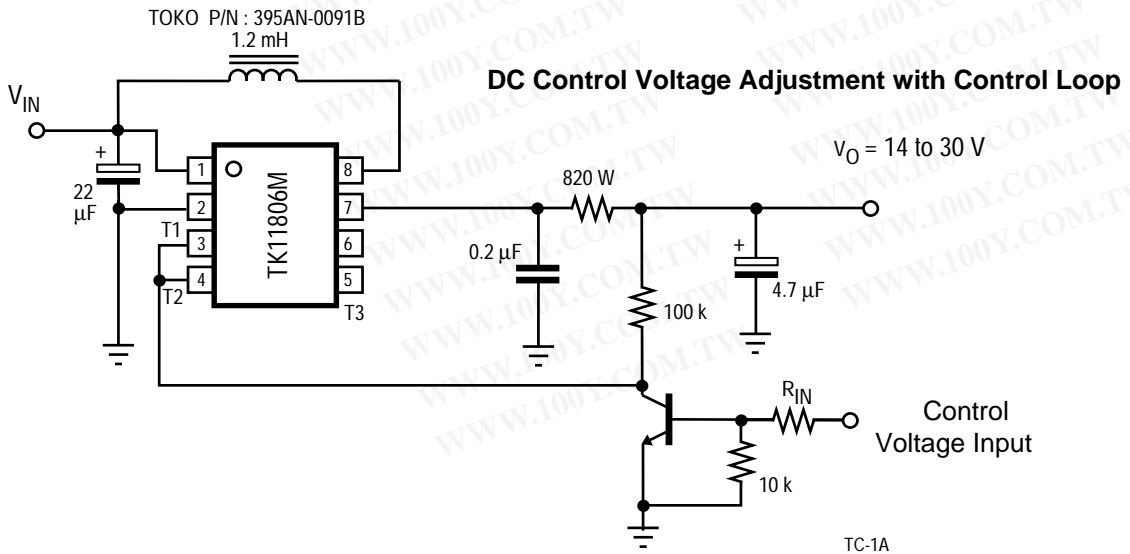
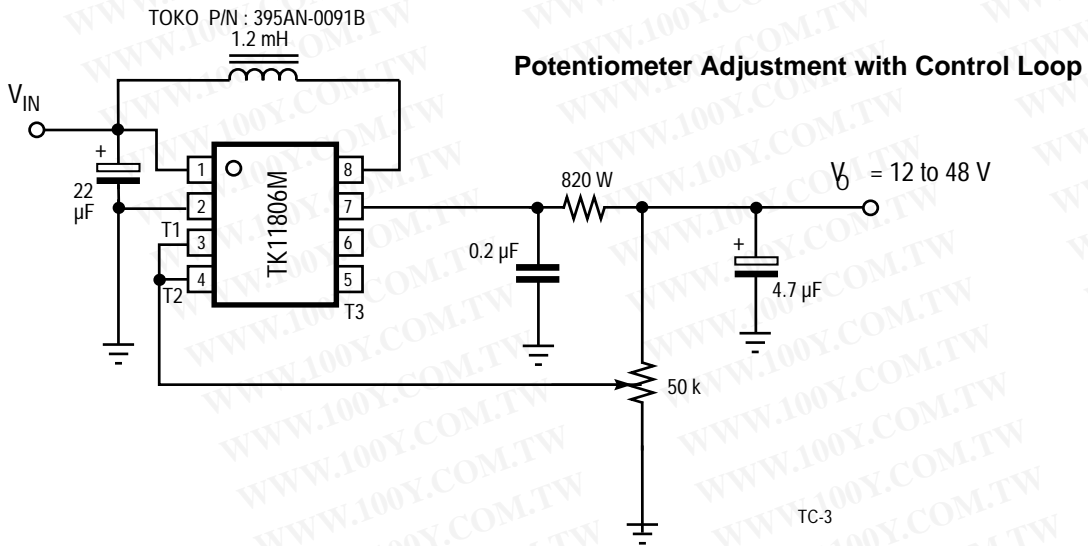
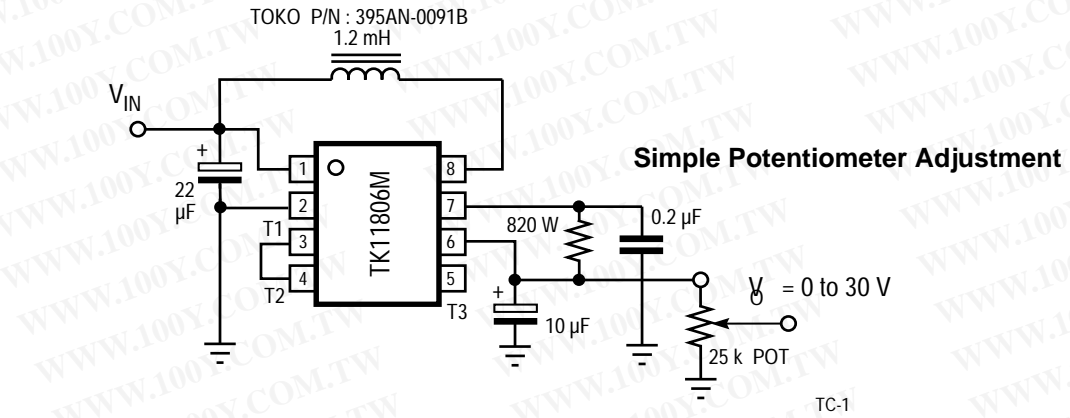




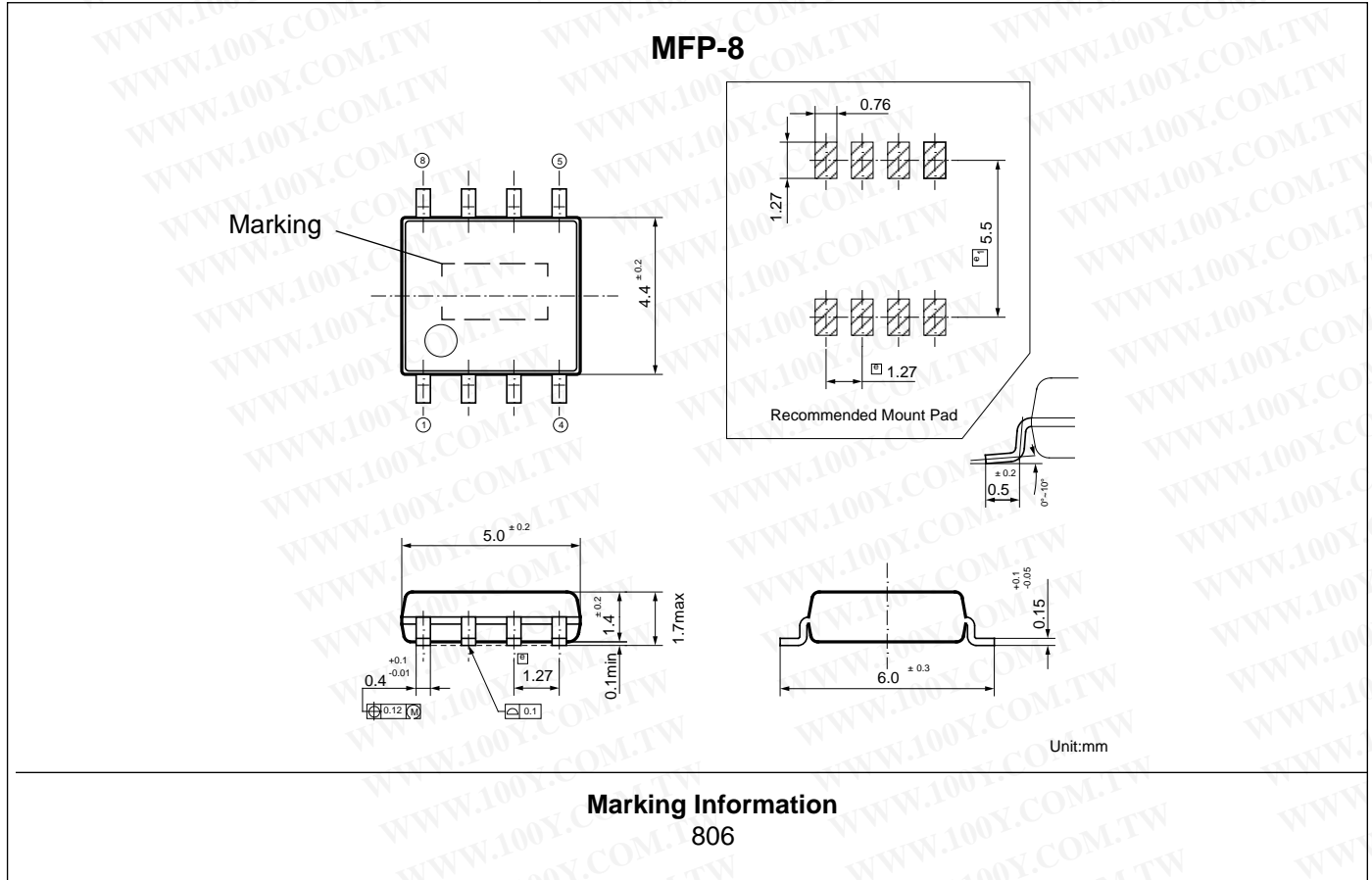
TYPICAL APPLICATIONS



METHODS FOR VARIABLE OUTPUT CONTROL



PACKAGE OUTLINES



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