



TK11821

DC-DC CONVERTER

FEATURES

- Very Low Noise
- Very Small Size
- Few External Components
- Wide Supply Voltage Range (0.9 to 10 V)
- Sinewave Oscillator
- Selectable Output Voltages

DESCRIPTION

The TK11821 is a low power, low input voltage DC-DC converter. The device has been optimized for variable capacitance diode and PIN photodiode bias applications. It generates 10 Vdc and 24 Vdc output voltages from an input voltage as low as 0.9 V.

Since the built-in high frequency oscillator generates sinewaves, the TK11821 produces very low RF interference noise. The internal oscillator is capable of operation at frequencies as high as 6-8 MHz, therefore, interference filtering is simple and effective. This unique feature makes the TK11821 ideally suitable for RF and fiber optic receiver applications.

The device is capable of operation in the 0.9 to 10 V power supply voltage range.

The output voltage is 24 V when T1 is not connected. When T1 is connected to V_O , the output voltage is set to 10 V.

The TK11821 is available in an 8-pin plastic surface mount (MFP-8) package. External inductive components are also available.

ORDERING INFORMATION

TK11821M



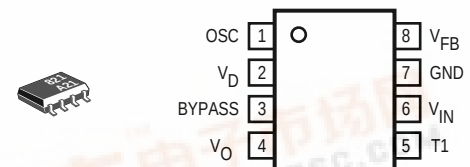
Tape/Reel Code

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

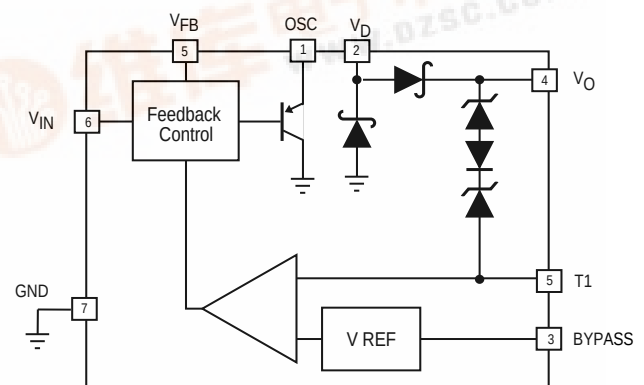
APPLICATIONS

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

TK11821M



BLOCK DIAGRAM



TK11821

ABSOLUTE MAXIMUM RATINGS

Input Voltage	10 V	Junction Temperature	150 °C
Output Voltage	26 V	Storage Temperature Range	-55 to +150 °C
Output Current	0.5 mA	Operating Temperature Range	-20 to +70 °C
Operating Voltage Range	0.9 to 10 V	Lead Soldering Temp. (10 sec.)	260 °C
Power Dissipation (Note 1)	350 mW		

ELECTRICAL CHARACTERISTICS

Test conditions: $V_{IN} = 0.9 \text{ V} \rightarrow 2.0 \text{ V}$

Operating Conditions: $V_{IN} = 1.1 \text{ V}$, $T_A = 25 \text{ °C}$ unless otherwise specified.

SYMBOL	PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNITS
I_{CC}	Input Current	$I_O = 0$, $V_O = 10 \text{ V}$		3.5	7.0	mA
		$I_O = 50 \text{ } \mu\text{A}$, $V_O = 10 \text{ V}$		5.5	9.0	mA
V_O	Output Voltage	$I_O = 0 \text{ } \mu\text{A}$, $1.6 \text{ V} \leq V_{IN} \leq 2.0 \text{ V}$	22.5	24.0	25.5	V
		V_O - T1 shorted, $I_O = 50 \text{ } \mu\text{A}$	9.6	10.0	10.4	V
I_O	Output Current	V_O - T1 shorted	90	100		μA
Load Reg	Load Regulation	Note 2		0.1	0.35	%
$\Delta V_O/T_A$	Output Voltage Temperature Dependency	$V_O = 24 \text{ V}$, $I_O = 50 \text{ } \mu\text{A}$		+2.3		mV/°C
		$V_O = 10 \text{ V}$, $I_O = 50 \text{ } \mu\text{A}$		-1.5		mV/°C
V_{OSC-S}	Oscillation Starting Voltage	$I_O = 0 \text{ } \mu\text{A}$	0.75			V
f_{OSC}	Oscillation Frequency	$I_O = 0 \text{ } \mu\text{A}$, Note 2		4.0		MHz

ELECTRICAL CHARACTERISTICS

Test conditions: $V_{IN} = 1.8 \text{ V} \rightarrow 10.0 \text{ V}$

Operating Conditions: $V_{IN} = 3.0 \text{ V}$, $T_A = 25 \text{ °C}$ unless otherwise specified.

SYMBOL	PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNITS
I_{CC}	Input Current	$I_O = 0$, $V_O = 10 \text{ V}$		3.5	7.0	mA
		$I_O = 50 \text{ } \mu\text{A}$, $V_O = 10 \text{ V}$		5.5	9.0	mA
V_O	Output Voltage	$I_O = 0 \text{ } \mu\text{A}$, $1.6 \text{ V} \leq V_{IN} \leq 2.0 \text{ V}$	22.5	24.0	25.5	V
		V_O - T1 shorted, $I_O = 50 \text{ } \mu\text{A}$	9.6	10.0	10.4	V
I_O	Output Current	V_O - T1 shorted	90	100		μA
Load Reg	Load Regulation	Note 2		0.1	0.35	%
$\Delta V_O/T_A$	Output Voltage Temperature Dependency	$V_O = 24 \text{ V}$, $I_O = 50 \text{ } \mu\text{A}$		+2.3		mV/°C
		$V_O = 10 \text{ V}$, $I_O = 50 \text{ } \mu\text{A}$		-1.5		mV/°C
V_{OSC-S}	Oscillation Starting Voltage	$I_O = 0 \text{ } \mu\text{A}$	1.5			V
f_{OSC}	Oscillation Frequency	$I_O = 0 \text{ } \mu\text{A}$, Note 2		3.5		MHz

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

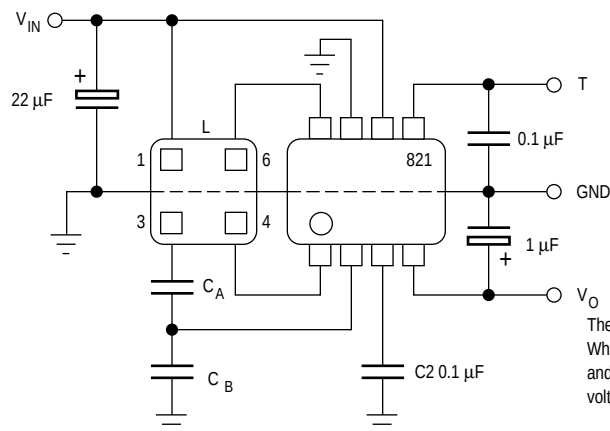
Note 2: Use the same value for L that was used in the measurement circuit.

Note 3: Output Voltage Variation = $(\Delta V_{O1}/V_{O1}) \times 100 \text{ (}\%)$, $\Delta V_{O1} = V_{O1} \text{ (no load)} - V_{O1} \text{ (} I_O = 50 \text{ } \mu\text{A)}$.

Note 4: The circuit constants will be changed by the input voltage at the 0.9 V to 2.0 V range and 1.8 V to 10 V range.

TEST CIRCUIT

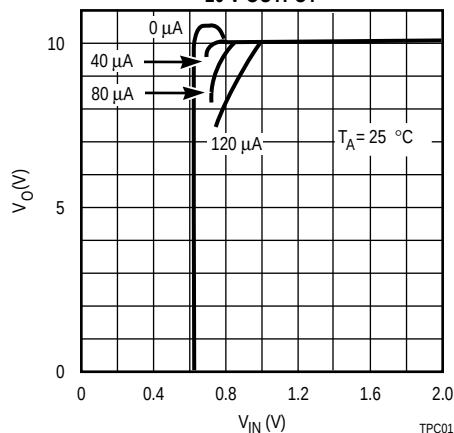
The value of the circuit constants against the input voltage.



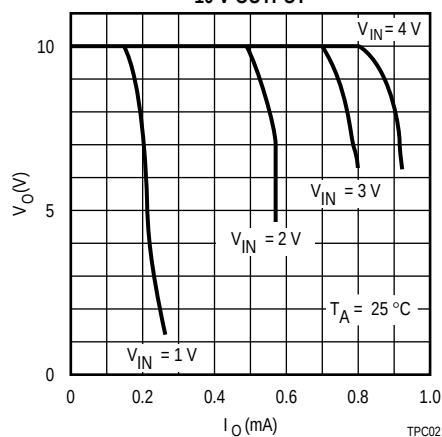
INPUT VOLTAGE	C_A	C_B	TOKO COIL PART NUMBER
0.9 V to 2 V	33 pF	10 pF	PS5CDLN-1250
1.8 V to 10 V	820 pF	33 pF	PS5CDLN-1303

TYPICAL PERFORMANCE CHARACTERISTICS

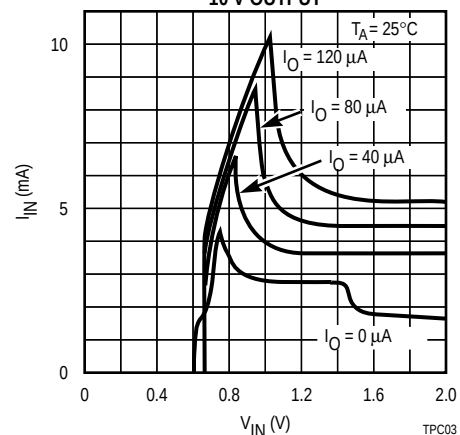
OUTPUT VOLTAGE vs. INPUT VOLTAGE
10 V OUTPUT



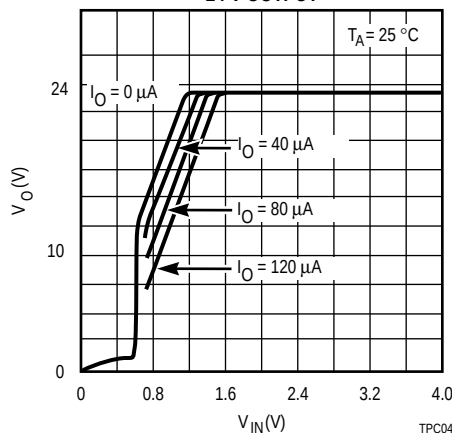
OUTPUT VOLTAGE vs. OUTPUT CURRENT
10 V OUTPUT



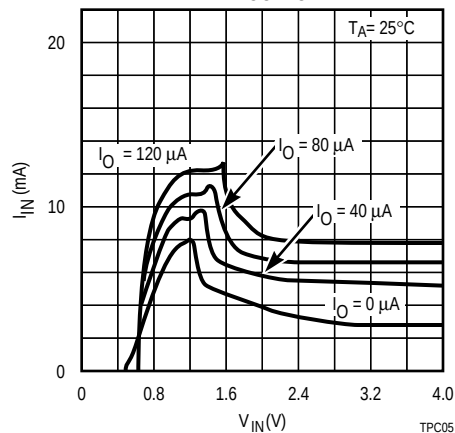
INPUT CURRENT vs. INPUT VOLTAGE
10 V OUTPUT



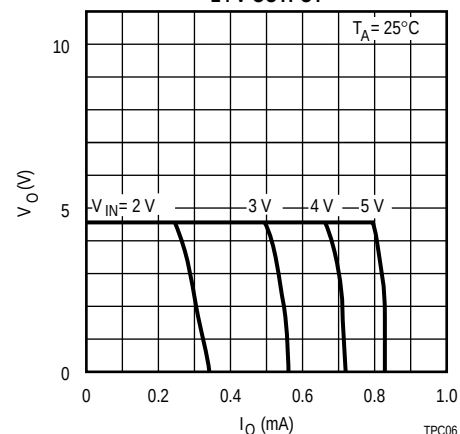
OUTPUT VOLTAGE vs. INPUT VOLTAGE
24 V OUTPUT



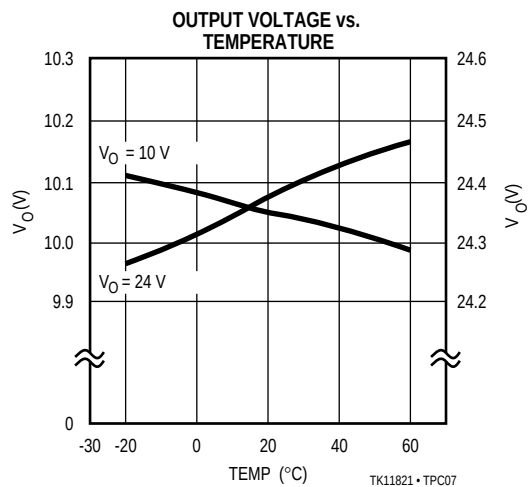
INPUT CURRENT vs. INPUT VOLTAGE
24 V OUTPUT



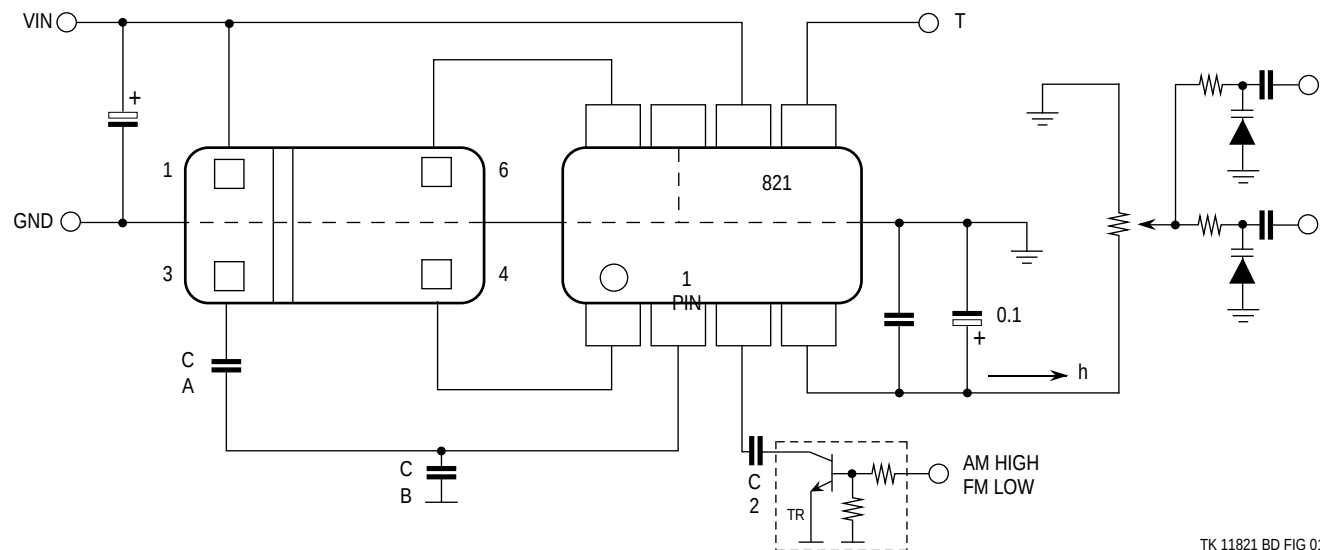
OUTPUT VOLTAGE vs. OUTPUT CURRENT
24 V OUTPUT



TYPICAL PERFORMANCE CHARACTERISTICS (CONT.)



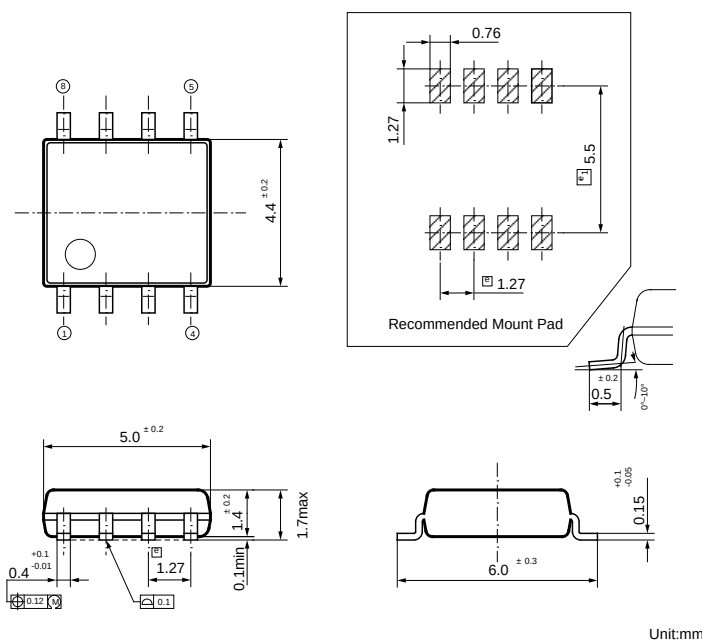
TYPICAL AM/FM VARACTOR DIODE BIAS CIRCUIT



TK 11821 BD FIG 01

PACKAGE OUTLINES

MFP-8

Marking Information
821

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