1.0A Low Dropout Positive Voltage Regulator

IL2940CT-xx

General Description

TO-220

1 – Input (IN)
2 – Ground (GND)
3 – Output (OUT)

— Maximum output current up to 1A

— Dropout voltage less than 0.8V at load current 1A

— Internal limitation of short circuit current

— Built-in overheat protection

— Protection from reverse polarity installation
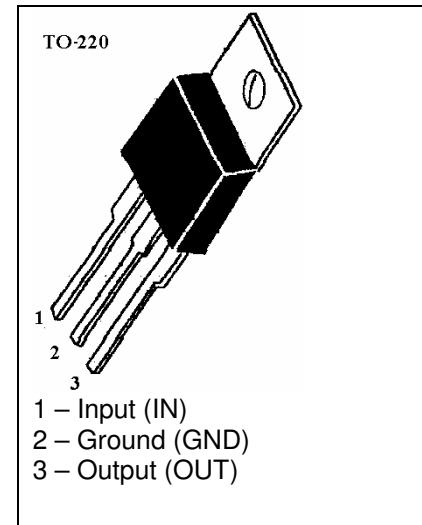
Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Maximum Line Transient (T≤1ms, R_0=100 Ohm)	V_{MIN}	45	V
Reverse Polarity Transient Input Voltage (T≤1ms, R_0=100 Ohm)	V_{MIN}	-45	V
Reverse Polarity DC Input Voltage (R_0=100 Ohm)	V_{MIN}	-15	V
Maximum Junction Temperature	T_J	150	ºC
Thermal Resistance Junction-to-Case	R_Θ	3	ºC/W
Thermal Resistance Junction-to-Ambient	R_Θ	62	ºC/W
Working Temperature Range	T_C	-10 ~ 125	ºC

Application Circuit

C_0=22 uF
C_I=0.47 uF

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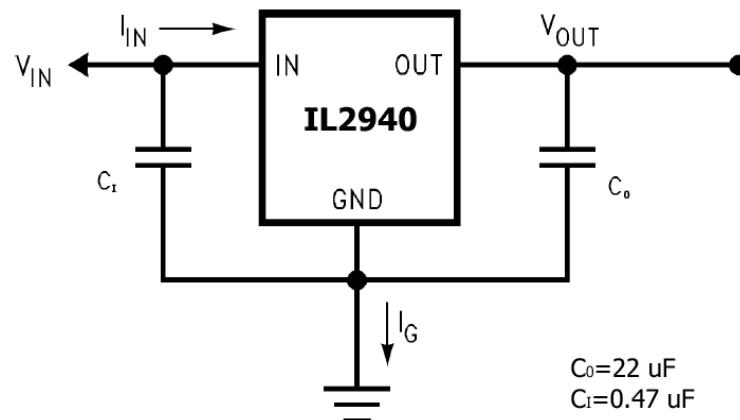
IL2940CT-5V ELECTRICAL CHARACTERISTICS

Parameter	Symbol	Test Conditions	Norm		Chip Temperature
			min	max	
Output Voltage, V	V_0	$6.25V \leq V_{IN} \leq 26V$ $5mA \leq I_0 \leq 1A$	4.85	5.15	25±10 ºC
			4.75	5.25	-10 ~ 125 ºC
Dropout Voltage, V	V_{DS}	$I_0 = 1A$		0.8	25±10 ºC
				1.0	-10 ~ 125 ºC
		$I_0 = 100mA$		0.15	25±10 ºC
				0.2	-10 ~ 125 ºC
Line Regulation, mV	$\Delta V_{0\,(V)}$	$7V \leq V_{IN} \leq 26V$ $I_0 = 5mA$		50	25±10 ºC
Load Regulation, mV	$\Delta V_{0\,(I)}$	$50mA \leq I_0 \leq 1A$ $V_{IN} = 10V$		50	
Short Circuit Current, A	I_{OS}	$V_0 = 0V, V_{IN} = 10V$	1.6		
Quiescent Current, mA	I_{CC}	$7V \leq V_{IN} \leq 26V$ $I_0 = 5mA$		15	25±10 ºC
		$I_0 = 1A, V_{IN} = 10V$		45	25±10 ºC
				60	-10 ~ 125 ºC
Ripple Rejection, dB	RR	$f_0=120Hz, V_{IN}=10V$ $I_0 = 100mA, V_{I\sim}=1V$	60		25±10 ºC

NOTES
1. All parameters are tested with input capacitor $C_I=0,47\mu F$ and output capacitor $C_0=22\mu F$
2. Line Regulation and Load Regulation are guaranteed for constant junction temperature. Impulse equipment should used to exclude temperature drift effects.

IL2940CT-12V ELECTRICAL CHARACTERISTICS

| Parameter	Symbol	Test Conditions	Norm		Chip Temperature
			min	max	
Output Voltage, V	V_0	$13.6V \leq V_{IN} \leq 26V$ $5mA \leq I_0 \leq 1A$	11.64	12.36	25±10 ºC
			11.4	12.6	-10 ~ 125 ºC
Dropout Voltage, V	V_{DS}	$I_0 = 1A$		0.8	25±10 ºC
				1.0	-10 ~ 125 ºC
		$I_0 = 100mA$		0.15	25±10 ºC
				0.2	-10 ~ 125 ºC
Line Regulation, mV	$\Delta V_{0\ (V)}$	$14V \leq V_{IN} \leq 26V$ $I_0 = 5mA$		120	25±10 ºC
Load Regulation, mV	$\Delta V_{0\ (I)}$	$5mA \leq I_0 \leq 1A$ $V_{IN} = 17V$		120	
Short Circuit Current, A	I_{OS}	$V_0 = 0V, V_{IN} = 17V$	1.6		
Quiescent Current, mA	I_{CC}	$14V \leq V_{IN} \leq 26V$ $I_0 = 5mA$		15	25±10 ºC
		$I_0 = 1A, V_{IN} = 17V$		45	25±10 ºC
				60	-10 ~ 125 ºC
Ripple Rejection, dB	RR	$f_0=120Hz, V_{IN}=17V$ $I_0 = 100mA, V_{I\sim}=1V$	54		25±10 ºC

NOTES
3. All parameters are tested with input capacitor C_I=0,47μF and output capacitor C_0=22μF
4. Line Regulation and Load Regulation are guaranteed for constant junction temperature. Impulse equipment should used to exclude temperature drift effects.

Typical Performance Characteristics
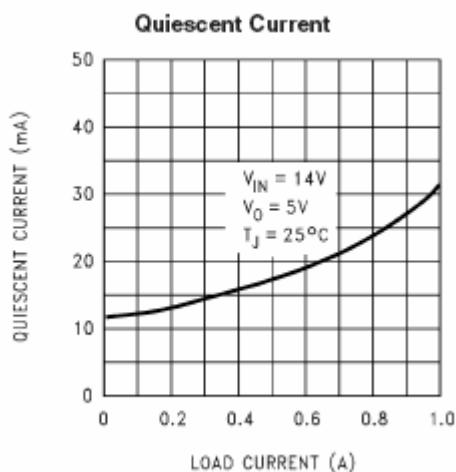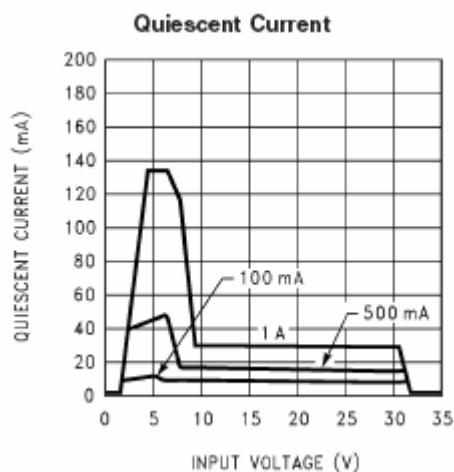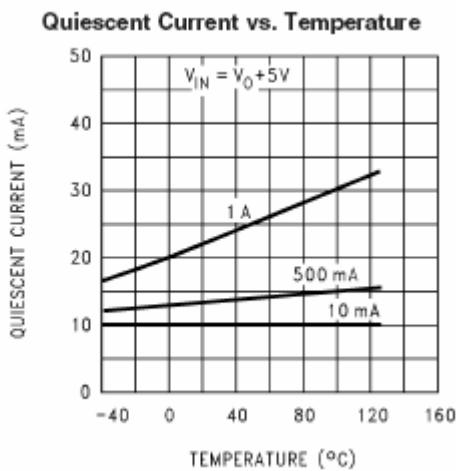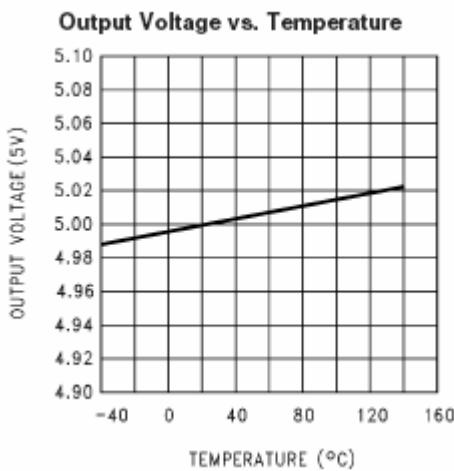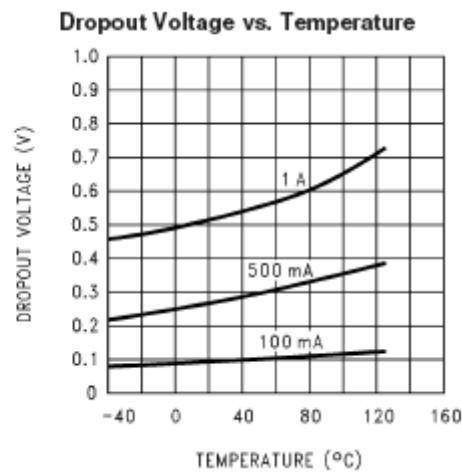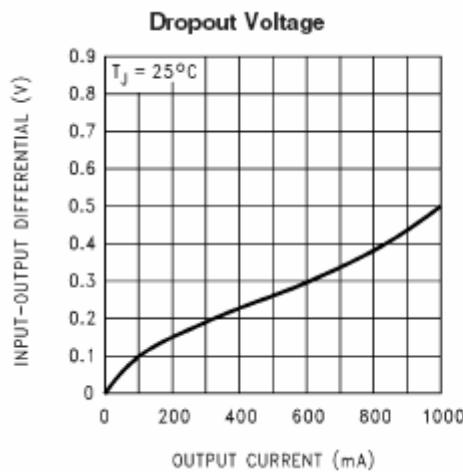
Dropout Voltage

Dropout Voltage vs. Temperature

Output Voltage vs. Temperature

Quiescent Current vs. Temperature

Quiescent Current

Quiescent Current

Typical Performance Characteristics (Continued)

Line Transient Response

Load Transient Response

Ripple Rejection

**Low Voltage Behavior**

Low Voltage Behavior

Low Voltage Behavior

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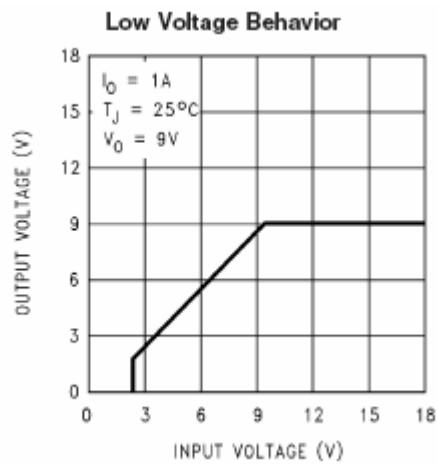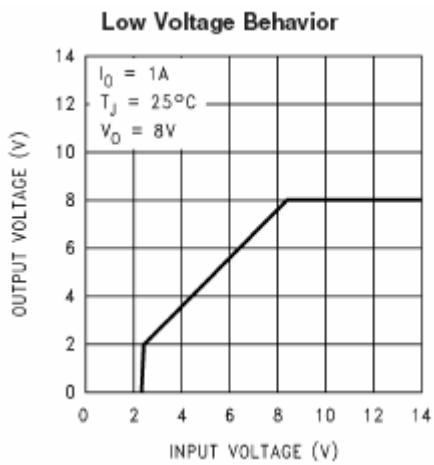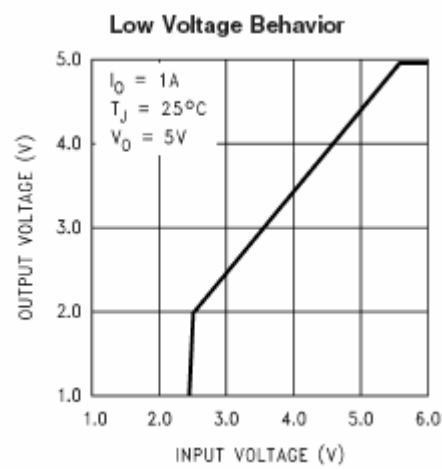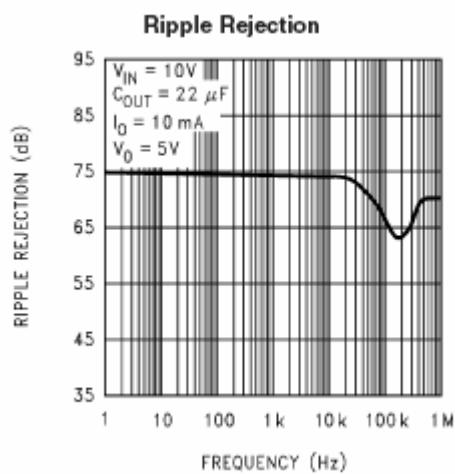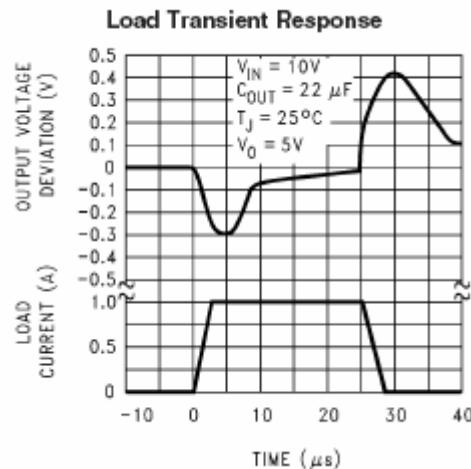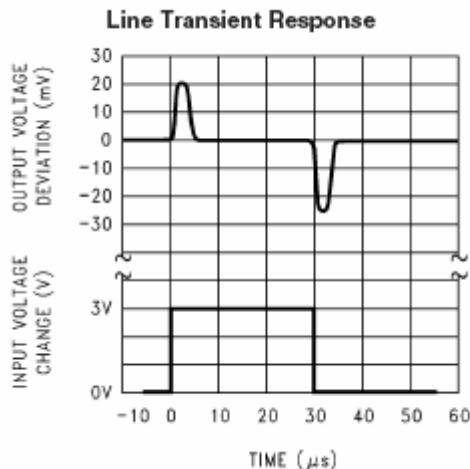
Typical Performance Characteristics (Continued)

Low Voltage Behavior
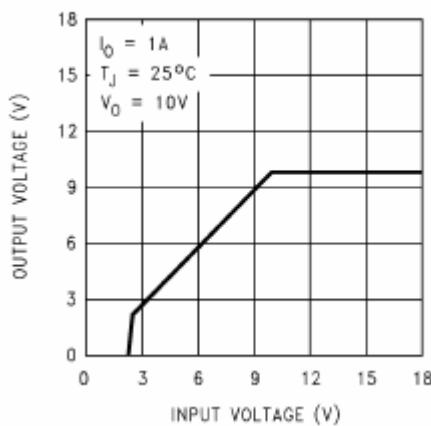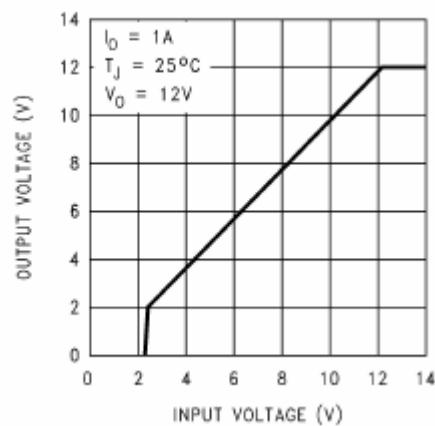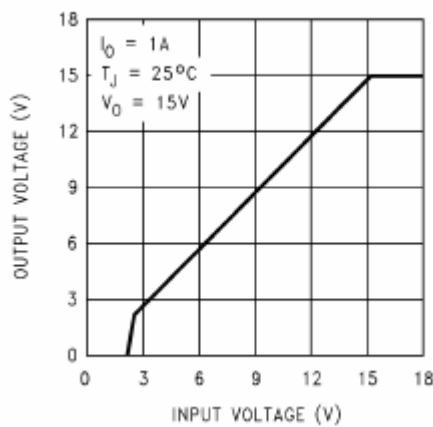
$I_O = 1A$
$T_J = 25°C$
$V_O = 10V$

Low Voltage Behavior

$I_O = 1A$
$T_J = 25°C$
$V_O = 12V$

Low Voltage Behavior

$I_O = 1A$
$T_J = 25°C$
$V_O = 15V$

Output at Voltage Extremes

$R_L = 100\Omega$
$V_O = 5V$

Output at Voltage Extremes

$R_L = 100\Omega$
$V_O = 8V$

### Output at Voltage Extremes

$R_L = 100\Omega$
$V_O = 9V$

Typical Performance Characteristics (Continued)

Output at Voltage Extremes

$R_L = 100 \Omega$
$V_0 = 10V$

OUTPUT VOLTAGE (V)

INPUT VOLTAGE (V)

Output at Voltage Extremes

$R_L = 100 \Omega$
$V_0 = 12V$

OUTPUT VOLTAGE (V)

INPUT VOLTAGE (V)

Output at Voltage Extremes

$R_L = 100 \Omega$
$V_0 = 15V$

OUTPUT VOLTAGE (V)

INPUT VOLTAGE (V)

Output Capacitor ESR

$C_{OUT} = 22 \mu F$
$V_0 = 5V$

STABLE
REGION

EQUIVALENT SERIES RESISTANCE (Ω)

OUTPUT CURRENT (mA)

Peak Output Current

$V_{IN} = 14V$

OUTPUT CURRENT (A)

TEMPERATURE (°C)

Output Impedance

$V_{IN} = 10V$
$C_{OUT} = 22 \mu F$
$I_0 = 50 mA$
$V_0 = 5V$

OUTPUT IMPEDANCE (Ω)

FREQUENCY (Hz)

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Typical Performance Characteristics (Continued)

Rev. 00

Maximum Power Dissipation (TO-220)
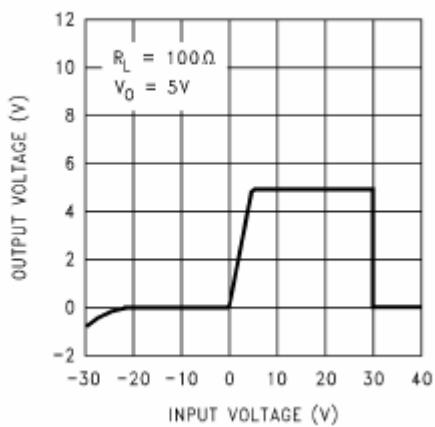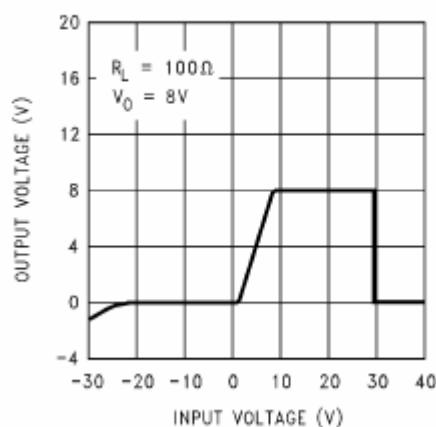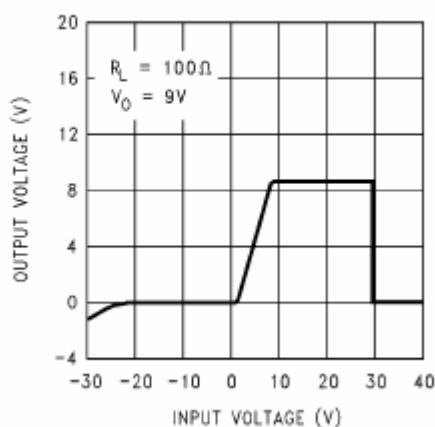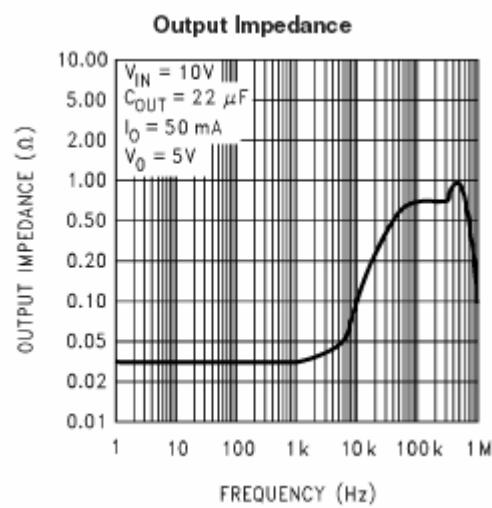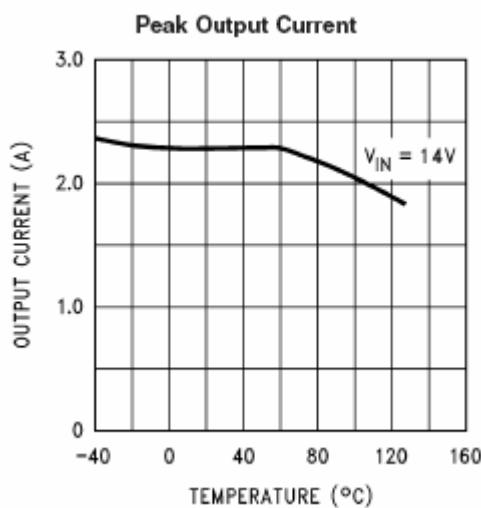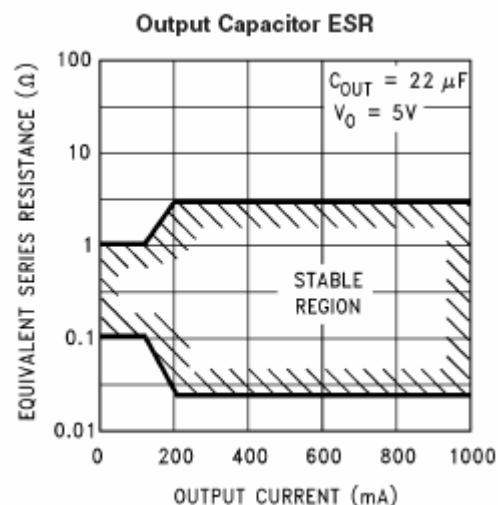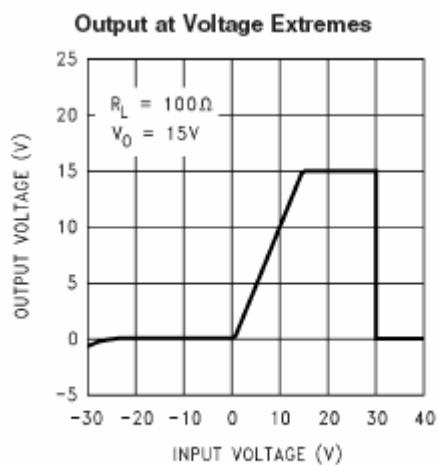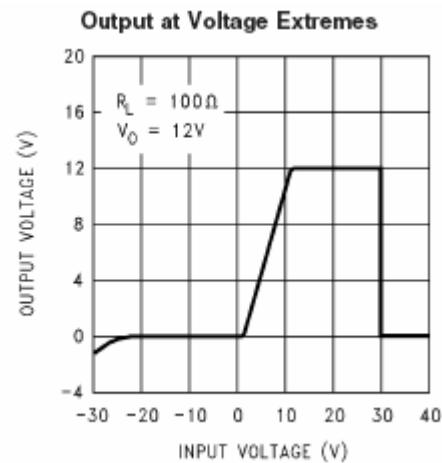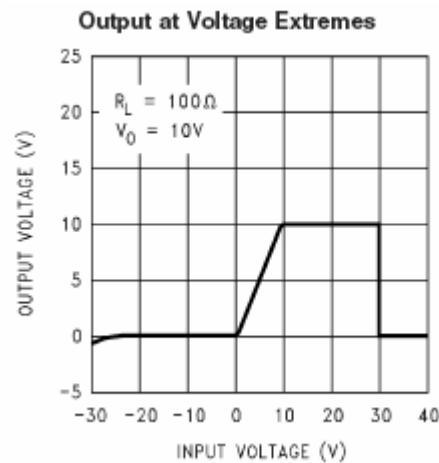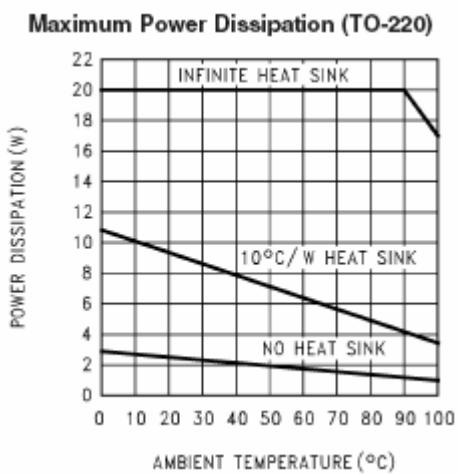
PKG OUTLINE DIMENSIONS

TO-220AB

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