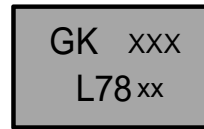


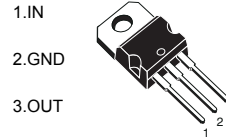
## Features

- Thermal overload protection
- Short circuit protection
- Output transition SOA protection
- 2 % output voltage tolerance (A version)
- Guaranteed in extended temperature range (A version)



LOGO **GK XXX** CODE

TO-220



## Absolute Maximum Ratings (T<sub>c</sub> = 25°C)

Symbol	Parameter	Value	UNIT
V <sub>I</sub>	Input Voltage	35	V
TOPR	Operating Temperature Range	0 ~ +125	°C
TSTG	Storage Temperature Range	-65 ~ +150	°C

## Electrical Characteristics

(T<sub>c</sub> = 25°C) Of 7805 (refer to the test circuits, T<sub>J</sub> = -55 to 150°C V<sub>I</sub> = 10V I<sub>O</sub> = 500 mA C<sub>I</sub> = 0.33 μF, C<sub>O</sub> = 0.1 μF unless otherwise specified).

Parameter	Symbol	Test Condition	MIN	TYP	MAX	UNIT
Output Voltage	V <sub>O</sub>	T <sub>J</sub> = +25°C	4.8	5	5.2	V
		I <sub>O</sub> = 5mA to 1A, P <sub>O</sub> ≤ 15W V <sub>I</sub> = 8V to 20V	4.75	5	5.25	
Line Regulation (Note1)	Δ V <sub>O</sub>	T <sub>J</sub> = +25°C	V <sub>I</sub> = 7V to 25V		100	mV
			V <sub>I</sub> = 8V to 12V		50	
Load Regulation (Note1)	Δ V <sub>O</sub>	T <sub>J</sub> = +25°C			100	mV
		I <sub>O</sub> = 5mA to 1.2A			50	
Quiescent Current	I <sub>Q</sub>	T <sub>J</sub> = +25°C			6	mA
Quiescent Current Change	Δ I <sub>Q</sub>	I <sub>O</sub> = 5mA to 1A			0.5	mA
		V <sub>I</sub> = 8V to 25V			0.8	
Quiescent Current Change	Δ V <sub>O</sub> /Δ T	I <sub>O</sub> = 5mA		0.6		mV/°C
Short Circuit Current	I <sub>SC</sub>	T <sub>J</sub> = +25° C, V <sub>I</sub> = 35V		0.75	1.2	A

## Electrical Characteristics

( $T_c=25^\circ\text{C}$ ) Of 7806 (refer to the test circuits,  $T_J = -55$  to  $150^\circ\text{C}$   $V_I = 11\text{V}$ ,  $I_O = 500\text{mA}$ ,  $C_I = 0.33\ \mu\text{F}$ ,  $C_O = 0.1\ \mu\text{F}$  unless otherwise specified).

Parameter	Symbol	Test Condition	MIN	TYP	MAX	UNIT
Output Voltage	$V_O$	$T_J = +25^\circ\text{C}$	5.75	6	6.25	V
		$I_O = 5\text{mA}$ to $1\text{A}$ , $P_O \leq 15\text{W}$ $V_I = 9\text{V}$ to $21\text{V}$	5.65	6	6.35	
Line Regulation (Note1)	$\Delta V_O$	$T_J = +25^\circ\text{C}$	$V_I = 8\text{V}$ to $25\text{V}$		100	mV
			$V_I = 9\text{V}$ to $13\text{V}$		50	
Load Regulation (Note1)	$\Delta V_O$	$T_J = +25^\circ\text{C}$ $I_O = 5\text{mA}$ to $1.2\text{A}$			100	mV
		$T_J = +25^\circ\text{C}$ $I_O = 250\text{mA}$ to $750\text{mA}$			50	
Quiescent Current	$I_Q$	$T_J = +25^\circ\text{C}$			6	mA
Quiescent Current Change	$\Delta I_Q$	$I_O = 5\text{mA}$ to $1\text{A}$			0.5	mA
		$V_I = 9\text{V}$ to $25\text{V}$			0.8	
Quiescent Current Change	$\Delta V_O/\Delta T$	$I_O = 5\text{mA}$		0.7		mV/ $^\circ\text{C}$
Short Circuit Current	ISC	$T_J = +25^\circ\text{C}$ , $V_I = 35\text{V}$		0.75	1.2	A

( $T_c=25^\circ\text{C}$ ) Of 7808 (refer to the test circuits,  $T_J = -55$  to  $150^\circ\text{C}$   $V_I = 14\text{V}$ ,  $I_O = 500\text{mA}$ ,  $C_I = 0.33\ \mu\text{F}$ ,  $C_O = 0.1\ \mu\text{F}$  unless otherwise specified).

Parameter	Symbol	Test Condition	MIN	TYP	MAX	UNIT
Output Voltage	$V_O$	$T_J = +25^\circ\text{C}$	7.7	8	8.3	V
		$I_O = 5\text{mA}$ to $1\text{A}$ , $P_O \leq 15\text{W}$ $V_I = 11.5\text{V}$ to $23\text{V}$	7.6	8	8.4	
Line Regulation (Note1)	$\Delta V_O$	$T_J = +25^\circ\text{C}$	$V_I = 10.5\text{V}$ to $25\text{V}$		100	mV
			$V_I = 11\text{V}$ to $17\text{V}$		50	
Load Regulation (Note1)	$\Delta V_O$	$T_J = +25^\circ\text{C}$ $I_O = 5\text{mA}$ to $1.2\text{A}$			100	mV
		$T_J = +25^\circ\text{C}$ $I_O = 250\text{mA}$ to $750\text{mA}$			50	
Quiescent Current	$I_Q$	$T_J = +25^\circ\text{C}$			6	mA
Quiescent Current Change	$\Delta I_Q$	$I_O = 5\text{mA}$ to $1\text{A}$			0.5	mA
		$V_I = 11.5\text{V}$ to $25\text{V}$			1	
Quiescent Current Change	$\Delta V_O/\Delta T$	$I_O = 5\text{mA}$		1		mV/ $^\circ\text{C}$
Short Circuit Current	ISC	$T_J = +25^\circ\text{C}$ , $V_I = 35\text{V}$		0.75	1.2	A

## Electrical Characteristics

( $T_c=25^\circ\text{C}$ ) Of 7809 (refer to the test circuits,  $T_J = -55$  to  $150^\circ\text{C}$   $V_I = 15\text{V}$ ,  $I_O = 500\text{ mA}$ ,  $C_I = 0.33\ \mu\text{F}$ ,  $C_O = 0.1\ \mu\text{F}$  unless otherwise specified)。

Parameter	Symbol	Test Condition	MIN	TYP	MAX	UNIT
Output Voltage	V <sub>O</sub>	T <sub>J</sub> = +25°C	8.64	9	9.36	V
		I <sub>O</sub> = 5mA to 1A, P <sub>O</sub> ≤ 15W V <sub>I</sub> = 11.5V to 26V	8.55	9	9.45	
Line Regulation (Note1)	Δ V <sub>O</sub>	T <sub>J</sub> = +25°C	V <sub>I</sub> = 11.5V to 26V		100	mV
			V <sub>I</sub> = 12V to 18V		50	
Load Regulation (Note1)	Δ V <sub>O</sub>	T <sub>J</sub> = +25°C I <sub>O</sub> = 5mA to 1.2A			100	mV
		T <sub>J</sub> = +25°C I <sub>O</sub> = 250mA to 750mA			50	
Quiescent Current	I <sub>Q</sub>	T <sub>J</sub> = +25°C			6	mA
Quiescent Current Change	Δ I <sub>Q</sub>	I <sub>O</sub> = 5mA to 1A			0.5	mA
		V <sub>I</sub> = 11.5V to 26V			1	
Quiescent Current Change	Δ V <sub>O</sub> /Δ T	I <sub>O</sub> = 5mA		1		mV/°C
Short Circuit Current	I <sub>SC</sub>	T <sub>J</sub> = +25° C, V <sub>I</sub> = 35V		0.75	1.2	A

( $T_c=25^\circ\text{C}$ ) Of 7812 (refer to the test circuits,  $T_J = -55$  to  $150^\circ\text{C}$   $V_I = 19\text{V}$ ,  $I_O = 500\text{ mA}$ ,  $C_I = 0.33\ \mu\text{F}$ ,  $C_O = 0.1\ \mu\text{F}$  unless otherwise specified)。

Parameter	Symbol	Test Condition	MIN	TYP	MAX	UNIT
Output Voltage	V <sub>O</sub>	T <sub>J</sub> = +25°C	11.5	12	12.5	V
		I <sub>O</sub> = 5mA to 1A, P <sub>O</sub> ≤ 15W V <sub>I</sub> = 15.5V to 27V	11.4	12	12.6	
Line Regulation (Note1)	Δ V <sub>O</sub>	T <sub>J</sub> = +25°C	V <sub>I</sub> = 14.5V to 30V		100	mV
			V <sub>I</sub> = 16V to 22V		50	
Load Regulation (Note1)	Δ V <sub>O</sub>	T <sub>J</sub> = +25°C I <sub>O</sub> = 5mA to 1.2A			100	mV
		T <sub>J</sub> = +25°C I <sub>O</sub> = 250mA to 750mA			50	
Quiescent Current	I <sub>Q</sub>	T <sub>J</sub> = +25°C			6	mA
Quiescent Current Change	Δ I <sub>Q</sub>	I <sub>O</sub> = 5mA to 1A			0.5	mA
		V <sub>I</sub> = 15V to 30V			1	
Quiescent Current Change	Δ V <sub>O</sub> /Δ T	I <sub>O</sub> = 5mA		1.5		mV/°C
Short Circuit Current	I <sub>SC</sub>	T <sub>J</sub> = +25° C, V <sub>I</sub> = 35V		0.75	1.2	A

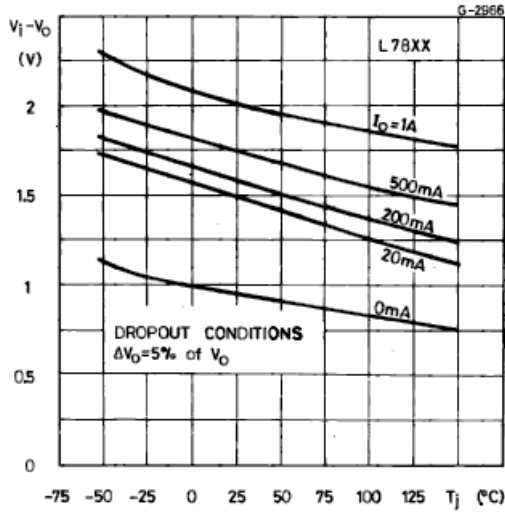
## Electrical Characteristics

( $T_c = 25^\circ\text{C}$ ) Of 7815 (refer to the test circuits,  $T_J = -40$  to  $150^\circ\text{C}$   $V_I = 19\text{V}$ ,  $I_O = 500\text{mA}$ ,  $C_I = 0.33\ \mu\text{F}$ ,  $C_O = 0.1\ \mu\text{F}$  unless otherwise specified).

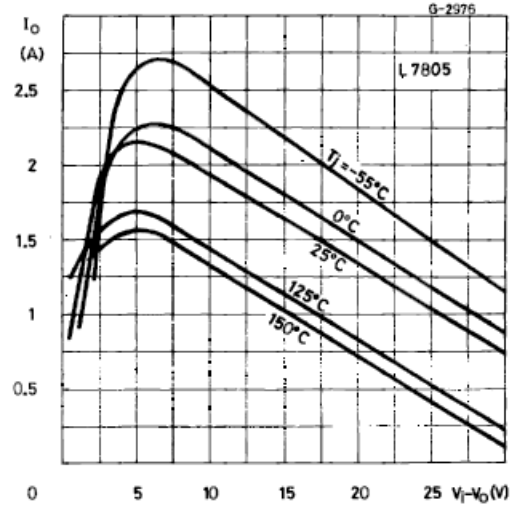
Parameter	Symbol	Test Condition	MIN	TYP	MAX	UNIT
Output Voltage	V <sub>O</sub>	T <sub>J</sub> = +25°C	14.4	15	15.6	V
		I <sub>O</sub> = 5mA to 1A, P <sub>O</sub> ≤ 15W V <sub>I</sub> = 15.5V to 27V	14.25	15	15.75	
Line Regulation (Note1)	ΔV <sub>O</sub>	T <sub>J</sub> = +25°C	V <sub>I</sub> = 14.5V to 30V		300	mV
			V <sub>I</sub> = 16V to 22V		150	
Load Regulation (Note1)	ΔV <sub>O</sub>	T <sub>J</sub> = +25°C I <sub>O</sub> = 5mA to 1.2A			100	mV
		T <sub>J</sub> = +25°C I <sub>O</sub> = 250mA to 750mA			150	
Quiescent Current	I <sub>Q</sub>	T <sub>J</sub> = +25°C			6	mA
Quiescent Current Change	ΔI <sub>Q</sub>	I <sub>O</sub> = 5mA to 1A			0.5	mA
		V <sub>I</sub> = 15V to 30V			1	
Quiescent Current Change	ΔV <sub>O</sub> /ΔT	I <sub>O</sub> = 5mA			1.5	mV/°C
Short Circuit Current	I <sub>SC</sub>	T <sub>J</sub> = +25° C, V <sub>I</sub> = 35V			0.23	A

**RATING AND CHARACTERISTIC CURVES**

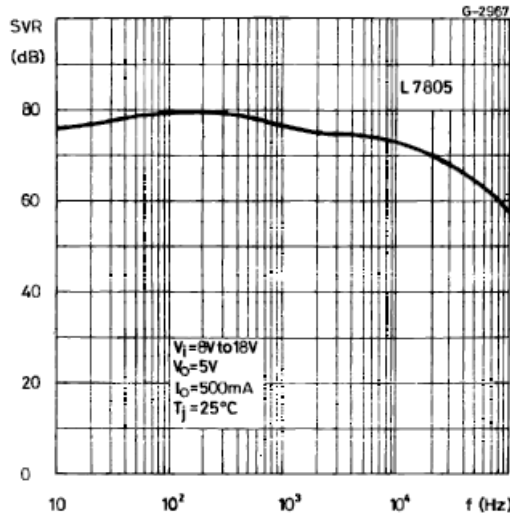
**Figure 1:** Dropout Voltage vs Junction Temperature



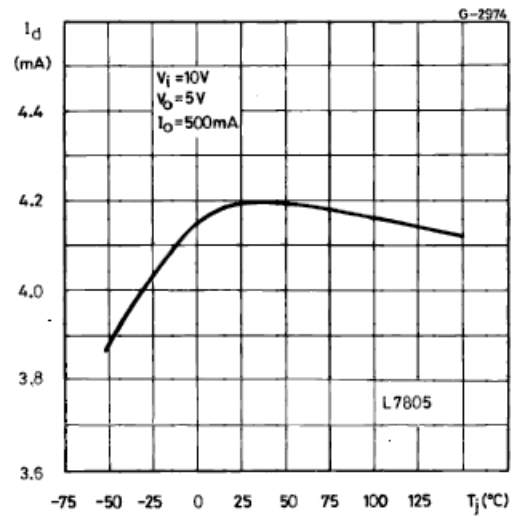
**Figure 2:** Peak Output Current vs Input/output Differential Voltage



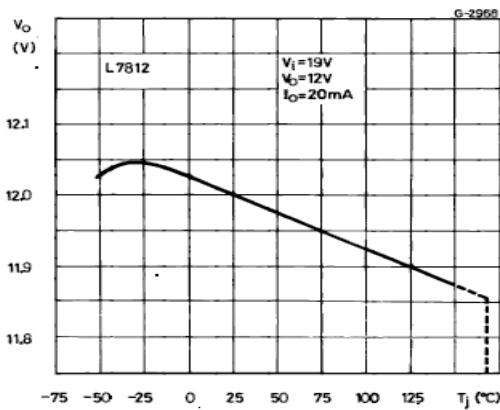
**Figure 3:** Supply Voltage Rejection vs Frequency Temperature



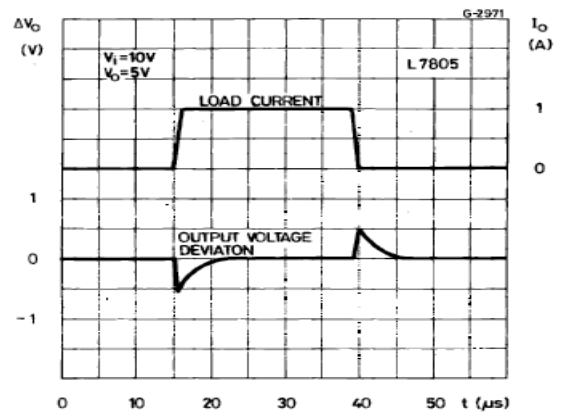
**Figure 4:** Quiescent Current vs Junction



**Figure 5:** Output Voltage vs Junction Temperature



**Figure 6:** Load Transient Response



RATING AND CHARACTERISTIC CURVES

Figure 7: Output Impedance vs Frequency

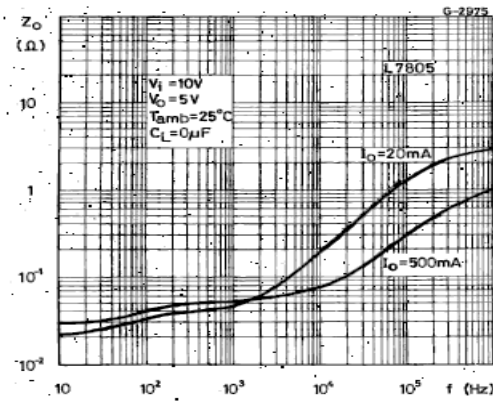


Figure 8: Line Transient Response

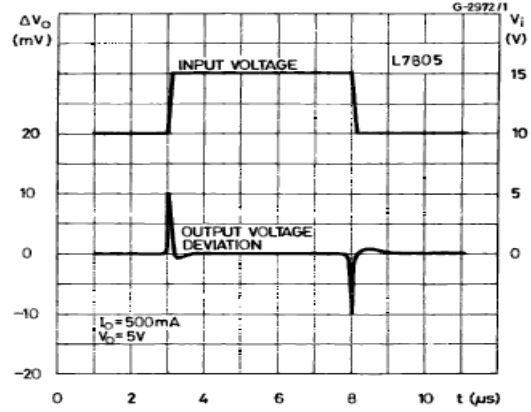
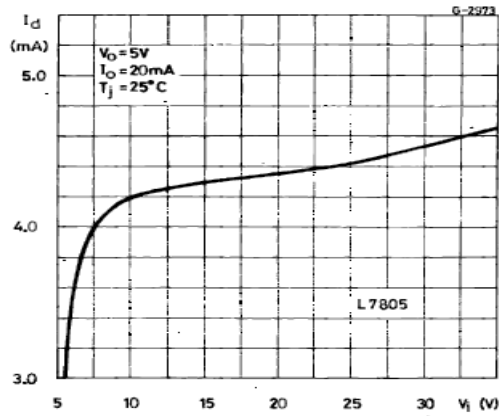
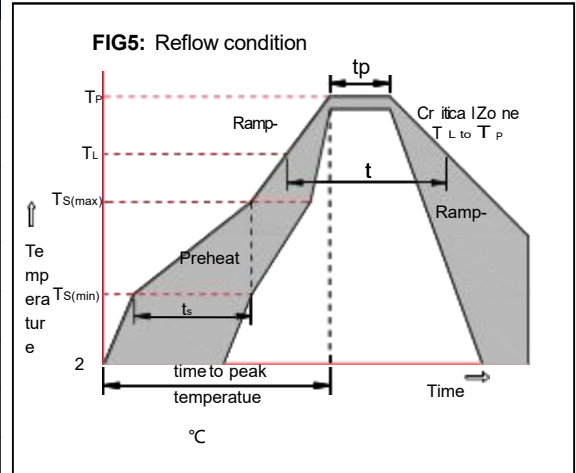


Figure 9: Quiescent Current vs Input Voltage



Soldering parameters

Reflow Condition		Pb-Free assembly (see as below)
Pre Heat	-Temperature Min ( $T_{s(min)}$ )	+150 °C
	-Temperature Max ( $T_{s(max)}$ )	+200 °C
	-Time (Min to Max) (ts)	60-180 secs.
Average ramp up rate (Liquid us Temp ( $T_L$ ) to peak)		3 °C/sec. Max
$T_{s(max)}$ to $T_L$ - Ramp-up Rate		3 °C/sec. Max
Reflow	-Temperature ( $T_L$ ) (Liquid us)	+217 °C
	-Temperature ( $t_L$ )	60-150 secs.
Peak Temp ( $T_P$ )		+260(+0/-5) °C
Time within 5 °C of actual Peak Temp ( $t_p$ )		30 secs. Max
Ramp-down Rate		6 °C/sec. Max
Time 25 °C to Peak Temp ( $T_P$ )		8 min. Max
Do not exceed		+260 °C



Package Dimensions & Suggested Pad Layout

