

- The implementation of standards:**

Seven post-secondary level: (Enterprise standard number: Q/PS QZJ07-2004)
QZJ840+15 "Seven special" Technical conditions

Prussians level: (Enterprise standard number: Q/PS 005-2004)
GB4589.1-89 (IIClass) GB/T12750-91

Industrial Grade: (Enterprise standard number: Q/PS 005-2004)
GB4589.1-89 (IClass) GB/T12750-91

- Main purposes:**

The role of regulator and protection for a variety of electrical appliances,
electronic equipment, regulator circuit

- Maximum Ratings**

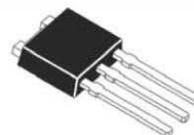
Parameter	Symbol	Ratings	Unit
Input voltage (T _A =25°C)	V _I	35	V
78M18~78M24	40		
Output current	I _O	0.5	A
Total power dissipation (T _A =25°C) ¹⁾	P _D	1.3	W
Ambient temperature (T _C =25°C) ²⁾	P _D	12	W
Work (tube shell) temperature	T _{OP}	-25~125	°C
Storage temperature	T _{stg}	-55~150	°C

In a well-ventilated

When the device is installed in T_C>25°C the radiator should be a derating

Three-terminal fixed output
voltage regulator

12W、0.5A、5V~24V



TO-251



TO-252

78M05 Electrical characteristics (Unless otherwise specified 0≤T_J≤+125°C, V_I=10V, I_O=350mA, C_i=0.33μF, C_o=0.1μF)

Parameter name	Symbol	Test Condition	Min	Typ	Max	Unit
Output Voltage	V _O	T _J =25°C	4.8	5	5.2	V
		5mA≤I _O ≤350mA, 7V≤V _I ≤20V	4.75	5	5.25	
Voltage Regulation	S _V	T _J =25°C I _O =200mA	7V≤V _I ≤25V	—	—	100
			8V≤V _I ≤25V	—	—	50
Current Regulation	S _I	T _J =25°C	5mA≤I _O ≤500mA	—	—	100
			5mA≤I _O ≤200mA,	—	—	50
Quiescent Current	I _Q	T _J =25°C	—	—	6	mA
Quiescent Current Change	△I _Q	5mA≤I _O ≤350mA	—	—	0.5	mA
		I _O =200mA, 8V≤V _I ≤25V	—	—	0.8	
Input - output differential pressure	V _I -V _O	T _J =25°C, I _O =500mA	—	2	—	V
Ripple Rejection Ratio	Srip	I _O =300mA, 8V≤V _I ≤18V, f=120Hz	—	78	—	dB

78M06 Electrical characteristics (Unless otherwise specified 0≤T_J≤+125°C, V_I=11V, I_O=350mA, C_i=0.33μF, C_o=0.1μF)

Parameter name	Symbol	Test Condition	Min	Typ	Max	Unit
Output Voltage	V _O	T _J =25°C	5.75	6	6.25	V
		5mA≤I _O ≤350mA, 8V≤V _I ≤21V	5.7	6	6.3	
Voltage Regulation	S _V	T _J =25°C I _O =200mA	8V≤V _I ≤25V	—	—	100
			9V≤V _I ≤25V	—	—	50
Current Regulation	S _I	T _J =25°C	5mA≤I _O ≤500mA	—	—	120
			5mA≤I _O ≤200mA,	—	—	60
Quiescent Current	I _Q	T _J =25°C	—	—	6	mA
Quiescent Current Change	△I _Q	5mA≤I _O ≤350mA	—	—	0.5	mA
		I _O =200mA, 9V≤V _I ≤25V	—	—	0.8	
Input - output differential pressure	V _I -V _O	T _J =25°C, I _O =500mA	—	2	—	V
Ripple Rejection Ratio	Srip	I _O =300mA, 9V≤V _I ≤19V, f=120Hz	—	75	—	dB

78M08 Electrical characteristics (Unless otherwise specified $0 \leq T_J \leq +125^\circ\text{C}$, $V_i=14\text{V}$, $I_o=350\text{mA}$, $C_i=0.33\mu\text{F}$, $C_o=0.1\mu\text{F}$)

Parameter name	Symbol	Test Condition		Min	Typ	Max	Unit
Output Voltage	V_o	$T_J=25^\circ\text{C}$		7.7	8	8.3	V
		$5\text{mA} \leq I_o \leq 350\text{mA}$, $10.5\text{V} \leq V_i \leq 23\text{V}$		7.6	8	8.4	
Voltage Regulation	S_v	$T_J=25^\circ\text{C}$ $I_o=200\text{mA}$	10.5V $\leq V_i \leq 25\text{V}$	—	—	100	mV
			11V $\leq V_i \leq 25\text{V}$	—	—	50	
Current Regulation	S_I	$T_J=25^\circ\text{C}$	5mA $\leq I_o \leq 500\text{mA}$	—	—	160	mV
			5mA $\leq I_o \leq 200\text{mA}$,	—	—	80	
Quiescent Current	I_Q	$T_J=25^\circ\text{C}$		—	—	6	mA
Quiescent Current Change	ΔI_Q	5mA $\leq I_o \leq 350\text{mA}$		—	—	0.5	mA
		$I_o=200\text{mA}$, $10.5\text{V} \leq V_i \leq 25\text{V}$		—	—	0.8	
Input - output differential pressure	$V_i - V_o$	$T_J=25^\circ\text{C}$, $I_o=500\text{mA}$		—	2	—	V
Ripple Rejection Ratio	Srip	$I_o=300\text{mA}$, $9\text{V} \leq V_i \leq 19\text{V}$, $f=120\text{Hz}$		—	73	—	dB

78M09 Electrical characteristics (Unless otherwise specified $0 \leq T_J \leq +125^\circ\text{C}$, $V_i=15\text{V}$, $I_o=350\text{mA}$, $C_i=0.33\mu\text{F}$, $C_o=0.1\mu\text{F}$)

Parameter name	Symbol	Test Condition		Min	Typ	Max	Unit
Output Voltage	V_o	$T_J=25^\circ\text{C}$		8.6	9	9.4	V
		5mA $\leq I_o \leq 350\text{mA}$, $11.5\text{V} \leq V_i \leq 24\text{V}$		8.55	9	9.45	
Voltage Regulation	S_v	$T_J=25^\circ\text{C}$ $I_o=200\text{mA}$	11.5V $\leq V_i \leq 25\text{V}$	—	—	100	mV
			12V $\leq V_i \leq 25\text{V}$	—	—	50	
Current Regulation	S_I	$T_J=25^\circ\text{C}$	5mA $\leq I_o \leq 500\text{mA}$	—	—	180	mV
			5mA $\leq I_o \leq 200\text{mA}$,	—	—	90	
Quiescent Current	I_Q	$T_J=25^\circ\text{C}$		—	—	6	mA
Quiescent Current Change	ΔI_Q	5mA $\leq I_o \leq 350\text{mA}$		—	—	0.5	mA
		$I_o=200\text{mA}$, $11.5\text{V} \leq V_i \leq 25\text{V}$		—	—	0.8	
Input - output differential pressure	$V_i - V_o$	$T_J=25^\circ\text{C}$, $I_o=500\text{mA}$		—	2	—	V
Ripple Rejection Ratio	Srip	$I_o=300\text{mA}$, $12.5\text{V} \leq V_i \leq 23\text{V}$, $f=120\text{Hz}$		—	71	—	dB

78M10 Electrical characteristics (Unless otherwise specified $0 \leq T_J \leq +125^\circ\text{C}$, $V_i=17\text{V}$, $I_o=350\text{mA}$, $C_i=0.33\mu\text{F}$, $C_o=0.1\mu\text{F}$)

Parameter name	Symbol	Test Condition		Min	Typ	Max	Unit
Output Voltage	V_o	$T_J=25^\circ\text{C}$		9.6	10	10.4	V
		5mA $\leq I_o \leq 350\text{mA}$, $12.5\text{V} \leq V_i \leq 25\text{V}$		9.5	10	10.5	
Voltage Regulation	S_v	$T_J=25^\circ\text{C}$ $I_o=200\text{mA}$	12.5V $\leq V_i \leq 25\text{V}$	—	—	100	mV
			13V $\leq V_i \leq 25\text{V}$	—	—	50	
Current Regulation	S_I	$T_J=25^\circ\text{C}$	5mA $\leq I_o \leq 500\text{mA}$	—	—	200	mV
			5mA $\leq I_o \leq 200\text{mA}$,	—	—	100	
Quiescent Current	I_Q	$T_J=25^\circ\text{C}$		—	—	6	mA
Quiescent Current Change	ΔI_Q	5mA $\leq I_o \leq 350\text{mA}$		—	—	0.5	mA
		$I_o=200\text{mA}$, $12.5\text{V} \leq V_i \leq 25\text{V}$		—	—	0.8	
Input - output differential pressure	$V_i - V_o$	$T_J=25^\circ\text{C}$, $I_o=500\text{mA}$		—	2	—	V
Ripple Rejection Ratio	Srip	$I_o=300\text{mA}$, $13\text{V} \leq V_i \leq 23\text{V}$, $f=120\text{Hz}$		—	71	—	dB

78M12 Electrical characteristics (Unless otherwise specified $0 \leq T_J \leq +125^\circ\text{C}$, $V_i=19\text{V}$, $I_o=350\text{mA}$, $C_i=0.33\mu\text{F}$, $C_o=0.1\mu\text{F}$)

Parameter name	Symbol	Test Condition		Min	Typ	Max	Unit
Output Voltage	V_o	$T_J=25^\circ\text{C}$		11.5	12	12.5	V
		$5\text{mA} \leq I_o \leq 350\text{mA}$, $14.5\text{V} \leq V_i \leq 27\text{V}$		11.5	12	12.6	
Voltage Regulation	S_v	$T_J=25^\circ\text{C}$ $I_o=200\text{mA}$	$14.5\text{V} \leq V_i \leq 30\text{V}$	—	—	100	mV
			$16\text{V} \leq V_i \leq 30\text{V}$	—	—	50	
Current Regulation	S_I	$T_J=25^\circ\text{C}$	$5\text{mA} \leq I_o \leq 500\text{mA}$	—	—	240	mV
			$5\text{mA} \leq I_o \leq 200\text{mA}$,	—	—	120	
Quiescent Current	I_Q	$T_J=25^\circ\text{C}$		—	—	6	mA
Quiescent Current Change	ΔI_Q	$5\text{mA} \leq I_o \leq 350\text{mA}$		—	—	0.5	mA
		$I_o=200\text{mA}$, $14.5\text{V} \leq V_i \leq 30\text{V}$		—	—	0.8	
Input - output differential pressure	$V_i - V_o$	$T_J=25^\circ\text{C}$, $I_o=500\text{mA}$		—	2	—	V
Ripple Rejection Ratio	Srip	$I_o=300\text{mA}$, $15\text{V} \leq V_i \leq 25\text{V}$, $f=120\text{Hz}$		—	71	—	dB

78M15 Electrical characteristics (Unless otherwise specified $0 \leq T_J \leq +125^\circ\text{C}$, $V_i=23\text{V}$, $I_o=350\text{mA}$, $C_i=0.33\mu\text{F}$, $C_o=0.1\mu\text{F}$)

Parameter name	Symbol	Test Condition		Min	Typ	Max	Unit
Output Voltage	V_o	$T_J=25^\circ\text{C}$		14.4	15	15.6	V
		$5\text{mA} \leq I_o \leq 350\text{mA}$, $17.5\text{V} \leq V_i \leq 30\text{V}$		14.25	15	15.75	
Voltage Regulation	S_v	$T_J=25^\circ\text{C}$ $I_o=200\text{mA}$	$17.5\text{V} \leq V_i \leq 30\text{V}$	—	—	100	mV
			$20\text{V} \leq V_i \leq 30\text{V}$	—	—	50	
Current Regulation	S_I	$T_J=25^\circ\text{C}$	$5\text{mA} \leq I_o \leq 500\text{mA}$	—	—	300	mV
			$5\text{mA} \leq I_o \leq 200\text{mA}$,	—	—	150	
Quiescent Current	I_Q	$T_J=25^\circ\text{C}$		—	—	6	mA
Quiescent Current Change	ΔI_Q	$5\text{mA} \leq I_o \leq 350\text{mA}$		—	—	0.5	mA
		$I_o=200\text{mA}$, $17.5\text{V} \leq V_i \leq 30\text{V}$		—	—	0.8	
Input - output differential pressure	$V_i - V_o$	$T_J=25^\circ\text{C}$, $I_o=500\text{mA}$		—	2	—	V
Ripple Rejection Ratio	Srip	$I_o=300\text{mA}$, $18.5\text{V} \leq V_i \leq 28.5\text{V}$, $f=120\text{Hz}$		—	70	—	dB

78M18 Electrical characteristics (Unless otherwise specified $0 \leq T_J \leq +125^\circ\text{C}$, $V_i=26\text{V}$, $I_o=350\text{mA}$, $C_i=0.33\mu\text{F}$, $C_o=0.1\mu\text{F}$)

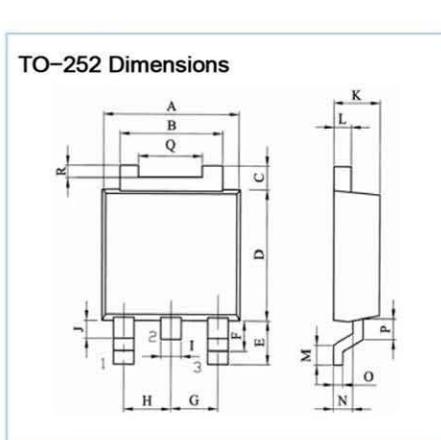
Parameter name	Symbol	Test Condition		Min	Typ	Max	Unit
Output Voltage	V_o	$T_J=25^\circ\text{C}$		17.3	18	18.7	V
		$5\text{mA} \leq I_o \leq 350\text{mA}$, $20.5\text{V} \leq V_i \leq 33\text{V}$		17.1	18	18.9	
Voltage Regulation	S_v	$T_J=25^\circ\text{C}$ $I_o=200\text{mA}$	$21\text{V} \leq V_i \leq 33\text{V}$	—	—	100	mV
			$24\text{V} \leq V_i \leq 33\text{V}$	—	—	50	
Current Regulation	S_I	$T_J=25^\circ\text{C}$	$5\text{mA} \leq I_o \leq 500\text{mA}$	—	—	360	mV
			$5\text{mA} \leq I_o \leq 200\text{mA}$,	—	—	180	
Quiescent Current	I_Q	$T_J=25^\circ\text{C}$		—	—	6	mA
Quiescent Current Change	ΔI_Q	$5\text{mA} \leq I_o \leq 350\text{mA}$		—	—	0.5	mA
		$I_o=200\text{mA}$, $21\text{V} \leq V_i \leq 33\text{V}$		—	—	0.8	
Input - output differential pressure	$V_i - V_o$	$T_J=25^\circ\text{C}$, $I_o=500\text{mA}$		—	2	—	V
Ripple Rejection Ratio	Srip	$I_o=300\text{mA}$, $22\text{V} \leq V_i \leq 32\text{V}$, $f=120\text{Hz}$		—	69	—	dB

78M20 Electrical characteristics (Unless otherwise specified $0 \leq T_J \leq +125^\circ\text{C}$, $V_i=29\text{V}$, $I_o=350\text{mA}$, $C_i=0.33\mu\text{F}$, $C_o=0.1\mu\text{F}$)

Parameter name	Symbol	Test Condition	Min	Typ	Max	Unit
Output Voltage	V_O	$T_J=25^\circ\text{C}$	19.2	20	20.8	V
		$5\text{mA} \leq I_O \leq 350\text{mA}, 23\text{V} \leq V_i \leq 35\text{V}$	19	20	21	
Voltage Regulation	S_V	$T_J=25^\circ\text{C}$	—	—	100	mV
		$I_O=200\text{mA}$	—	—	50	
Current Regulation	S_I	$T_J=25^\circ\text{C}$	—	—	400	mV
		$5\text{mA} \leq I_O \leq 500\text{mA}$	—	—	200	
Quiescent Current	I_Q	$T_J=25^\circ\text{C}$	—	—	6	mA
Quiescent Current Change	ΔI_Q	$5\text{mA} \leq I_O \leq 350\text{mA}$	—	—	0.5	mA
		$I_O=200\text{mA}, 23\text{V} \leq V_i \leq 35\text{V}$	—	—	0.8	
Input - output differential pressure	$V_{I^-} - V_O$	$T_J=25^\circ\text{C}, I_O=500\text{mA}$	—	2	—	V
Ripple Rejection Ratio	S_{RIP}	$I_O=300\text{mA}, 24\text{V} \leq V_i \leq 34\text{V}, f=120\text{Hz}$	—	69	—	dB

 78M24 Electrical characteristics (Unless otherwise specified $0 \leq T_J \leq +125^\circ\text{C}$, $V_i=33\text{V}$, $I_o=350\text{mA}$, $C_i=0.33\mu\text{F}$, $C_o=0.1\mu\text{F}$)

Parameter name	Symbol	Test Condition	Min	Typ	Max	Unit
Output Voltage	V_O	$T_J=25^\circ\text{C}$	23	24	25	V
		$5\text{mA} \leq I_O \leq 350\text{mA}, 27\text{V} \leq V_i \leq 38\text{V}$	22.8	24	25.2	
Voltage Regulation	S_V	$T_J=25^\circ\text{C}$	—	—	100	mV
		$I_O=200\text{mA}$	—	—	50	
Current Regulation	S_I	$T_J=25^\circ\text{C}$	—	—	480	mV
		$5\text{mA} \leq I_O \leq 500\text{mA}$	—	—	240	
Quiescent Current	I_Q	$T_J=25^\circ\text{C}$	—	—	6	mA
Quiescent Current Change	ΔI_Q	$5\text{mA} \leq I_O \leq 350\text{mA}$	—	—	0.5	mA
		$I_O=200\text{mA}, 27\text{V} \leq V_i \leq 38\text{V}$	—	—	0.8	
Input - output differential pressure	$V_{I^-} - V_O$	$T_J=25^\circ\text{C}, I_O=500\text{mA}$	—	2	—	V
Ripple Rejection Ratio	S_{RIP}	$I_O=300\text{mA}, 28\text{V} \leq V_i \leq 38\text{V}; f=120\text{Hz}$	—	67	—	dB



Symbol	TO-252		Symbol	TO-252	
	min	max		min	max
A	6.4	6.8	J	0.6	0.95
B	4.8	5.53	K	2.1	2.5
C	0.9	1.3	L	0.4	0.6
D	5.9	6.3	M	0.80	1.4
E	2.3	2.9	N	0.9	1.1
F	1.8	2.2	O	0.4	0.6
G	2.2	2.4	P	0.81	1.01
H	2.2	2.4	Q	3.6	4.0
I	0.66	0.92	R	0.4	0.6

1 IN 2 GND 3 OUT 4 GND