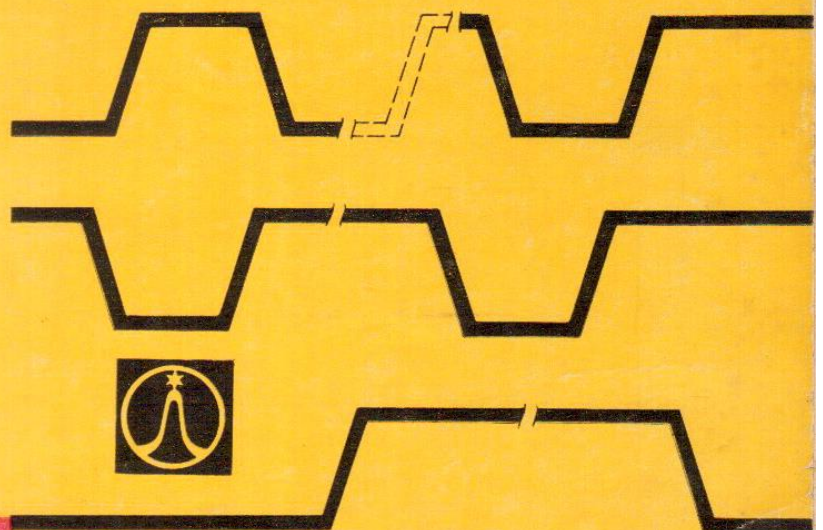
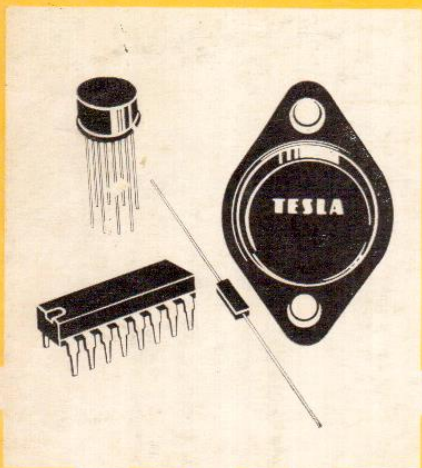


TESLA

INTEGRATED CIRCUITS
INTEGRIERTE SCHALTKREISE

LINEAR
DIGITAL



INTEGRATED POWER POSITIVE VOLTAGE REGULATORS
INTEGRIERTE LEISTUNGS-POSITIV-SPANNUNGSREGLER
5, 12, 15, 24 V / 1 A

MA7805
MA7812
MA7815
MA7824

Maximum ratings • Grenzwerte

Input voltage MA7805, MA7812, MA7815 MA7824	Eingangsspannung	U_I	max	35	V
		U_I	max	40	V
Power dissipation	Verlustleistung	P_W	max	internally limited innen begrenzt	W
Junction temperature range	Sperrschichttemperaturbereich	ϑ_j	max	0 ... +125	°C
Storage temperature range	Lagertemperaturbereich	ϑ_{stg}	max	-55 ... +155	°C
Thermal resistance junction - case	Wärmewiderstand System-Gehäuse System-Umgebung	R_{thjc}	max	4	K/W
junction - ambient		R_{thja}	max	35	K/W

- | | | |
|---|---|---|
| 1 | starting circuit | Startkreis |
| 2 | reference voltage | Referenzspannung |
| 3 | current source | Stromquelle |
| 4 | error amplifier | Fehlerverstärker |
| 5 | thermal shut-down | Thermische Abschaltung |
| 6 | current protection | Stromschutzschaltung |
| 7 | protection against
secondary breakdown | Schutzschaltung gegen
Sekundärdurchbruch |

Characteristic data • Kenndaten

Outlines • Abmessungen IO 11

0 °C < ϑ_j < +125 °C, (unless otherwise noted) • (wenn nicht anders angegeben)

MA7805

Valid at • Gültig bei

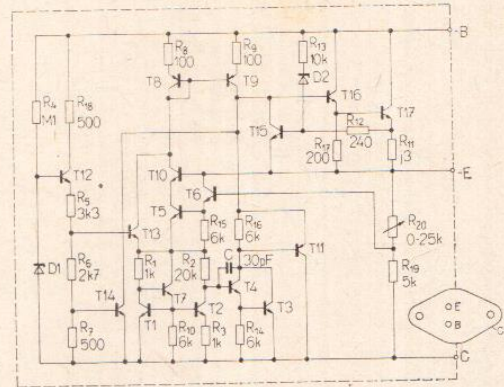
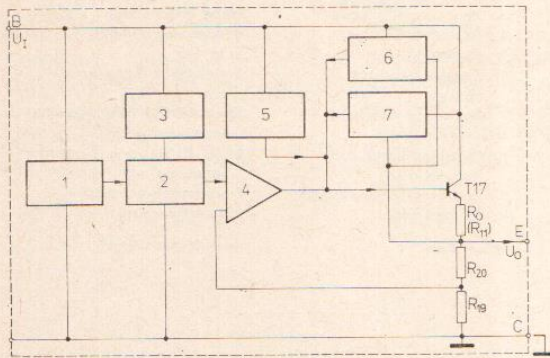
$U_I = 10 \text{ V}, I_O = 500 \text{ mA}$

Output voltage $\vartheta_j = 25 \text{ °C}$	Ausgangsspannung		nom.	min. - max.	V
		U_O	5,0	4,8 ... 5,2	
Line regulation	Netzregelung				
$\vartheta_j = 25 \text{ °C}, 7 \text{ V} < U_I < 25 \text{ V}$		ΔU_O	3,0	< 100	mV
$\vartheta_j = 25 \text{ °C}, 8 \text{ V} < U_I < 12 \text{ V}$		ΔU_O	1,0	< 50	mV
$\vartheta_j = 25 \text{ °C}, 14,5 \text{ V} < U_I < 30 \text{ V}$		ΔU_O	—	—	mV
$\vartheta_j = 25 \text{ °C}, 16 \text{ V} < U_I < 22 \text{ V}$		ΔU_O	—	—	mV
$\vartheta_j = 25 \text{ °C}, 17,5 \text{ V} < U_I < 30 \text{ V}$		ΔU_O	—	—	mV
$\vartheta_j = 25 \text{ °C}, 20 \text{ V} < U_I < 26 \text{ V}$		ΔU_O	—	—	mV
$\vartheta_j = 25 \text{ °C}, 27 \text{ V} < U_I < 38 \text{ V}$		ΔU_O	—	—	mV
$\vartheta_j = 25 \text{ °C}, 30 \text{ V} < U_I < 36 \text{ V}$		ΔU_O	—	—	mV
Load regulation	Lastregelung				
$\vartheta_j = 25 \text{ °C}, 5 \text{ mA} < I_O < 1,5 \text{ A}$		ΔU_O	15	< 100	mV
$\vartheta_j = 25 \text{ °C}, 250 \text{ mA} < I_O < 750 \text{ mA}$		ΔU_O	5,0	< 50	mV
Output voltage — $P \leq 15 \text{ W}$	Ausgangsspannung — $P \leq 15 \text{ W}$				
7 V < U_I < 20 V, 5 mA < I_O < 1 A		U_O	—	4,75 ... 5,25	V
14,5 V < U_I < 27 V, 5 mA < I_O < 1 A		U_O	—	—	V
17,5 V < U_I < 30 V, 5 mA < I_O < 1 A		U_O	—	—	V
27,5 V < U_I < 38 V, 5 mA < I_O < 1 A		U_O	—	—	V
Quiescent current $\vartheta_j = 25 \text{ °C}$	Ruhestrom	I_Q	4,2	< 8,0	mA
Quiescent current range	Ruhestromänderung				
7 V < U_I < 25 V		ΔI_Q	—	< 1,3	mA
14,5 V < U_I < 30 V		ΔI_Q	—	—	mA
17,5 V < U_I < 30 V		ΔI_Q	—	—	mA
27 V < U_I < 38 V		ΔI_Q	—	—	mA
5 mA < I_O < 1 A		ΔI_Q	—	< 0,5	mA
Output noise voltage $\vartheta_j = 25 \text{ °C}, 10 \text{ Hz} < f < 100 \text{ kHz}$	Ausgangsrauschspannung	U_{ON}	4,0	—	μV
Long term stability	Langzeitstabilität	ΔU_{OT}	—	< 20	mV
Ripple rejection	Brummunterdrückung				
f = 100 Hz, 8 V < U_I < 18 V		SVR	78	> 62	dB
f = 100 Hz, 15 V < U_I < 25 V		SVR	—	—	dB
f = 100 Hz, 18,5 V < U_I < 28,5 V		SVR	—	—	dB
f = 100 Hz, 28 V < U_I < 38 V		SVR	—	—	dB
Dropout voltage $I_O = 1 \text{ A}, \vartheta_j = 25 \text{ °C}$	Abfallspannung	$(U_I - U_O)_{\text{min}}$	2,0	—	V
Output resistance f = 1 kHz	Ausgangswiderstand	R_O	17	—	m Ω
Short circuit current limit $\vartheta_j = 25 \text{ °C}$	Ausgangs-Kurzschluss-Strombegrenzung	I_{OS}	750	—	mA
Output peak current $\vartheta_j = 25 \text{ °C}$	Ausgangsspitzenstrom	I_{OP}	2,2	—	A
Average temperature coefficient of output voltage $I_O = 5 \text{ mA}, 0 \text{ °C} < \vartheta_j < +125 \text{ °C}$	Mittl. Temperaturkoeffizient von Ausgangsspannung	T_K	-1,1	—	mV/K

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5, 12, 15, 24 V / 1 A



MA7812

MA7815

MA7824

	$U_I = 19\text{ V}, I_O = 500\text{ mA}$			$U_I = 23\text{ V}, I_O = 250\text{ mA}$			$U_I = 33\text{ V}, I_O = 500\text{ mA}$			V
	nom.	min.	max.	nom.	min.	max.	nom.	min.	max.	
U_O	12,0	11,5	12,5	15,0	14,4	15,6	24	23	25	
ΔU_O		—	—	—	—	—	—	—	—	mV
ΔU_O	10	< 240	—	—	—	—	—	—	—	mV
ΔU_O	3,0	< 120	—	—	—	—	—	—	—	mV
ΔU_O	—	—	—	11	< 300	—	—	—	—	mV
ΔU_O	—	—	—	3,0	< 150	—	—	—	—	mV
ΔU_O	—	—	—	—	—	—	18	< 480	—	mV
ΔU_O	—	—	—	—	—	—	6,0	< 240	—	mV
ΔU_O	12	< 240	—	12	< 150	—	12	< 480	—	mV
ΔU_O	4,0	< 120	—	4,0	< 75	—	4,0	< 240	—	mV
U_O	—	—	—	—	—	—	—	—	—	V
U_O	—	11,4	12,6	—	—	—	—	—	—	V
U_O	—	—	—	—	14,25	15,75	—	—	—	V
U_O	—	—	—	—	—	—	—	22,8	25,2	V
I_Q	4,3	< 8,0	—	4,4	< 8,0	—	4,6	< 8,0	—	mA
ΔI_Q	—	—	—	—	—	—	—	—	—	mA
ΔI_Q	—	< 1,0	—	—	< 1,0	—	—	< 1,0	—	mA
ΔI_Q	—	—	—	—	—	—	—	—	—	mA
ΔI_Q	—	< 0,5	—	—	< 0,5	—	—	< 0,5	—	mA
U_{ON}	75	—	—	90	—	—	170	—	—	μV
ΔU_{OT}	—	< 48	—	—	< 60	—	—	< 96	—	mV
SVR	—	—	—	—	—	—	—	—	—	dB
SVR	71	> 55	—	—	> 54	—	—	> 50	—	dB
SVR	—	—	—	70	—	—	—	—	—	dB
SVR	—	—	—	—	—	—	66	—	—	dB
$(U_I - U_O)_{\text{min}}$	2,0	—	—	2,0	—	—	2,0	—	—	V
R_O	18	—	—	19	—	—	28	—	—	$\text{m}\Omega$
I_{OS}	350	—	—	230	—	—	150	—	—	mA
I_{OP}	2,2	—	—	2,1	—	—	2,1	—	—	A
T_K	-1,0	—	—	-1,0	—	—	-1,5	—	—	mV/K

