LINEAR INTEGRATED CIRCUIT

TDA 1412

12 V VOLTAGE REGULATOR

- OUTPUT CURRENT > 500 mA
- TIGHT TOLERANCE for OUTPUT VOLTAGE
- LOAD REGULATION LESS THAN 1%
- RIPPLE REJECTION 60 dB TYPICAL
- LOW OUTPUT IMPEDANCE
- EXCELLENT TRANSIENT RESPONSE
- HIGH TEMPERATURE STABILITY

The TDA 1412 is a silicon monolithic voltage regulator in Jedec TO-126 plastic package which can supply more than 500 mA. It incorporates the following functions:

— internal overload protection
— short-circuit protection

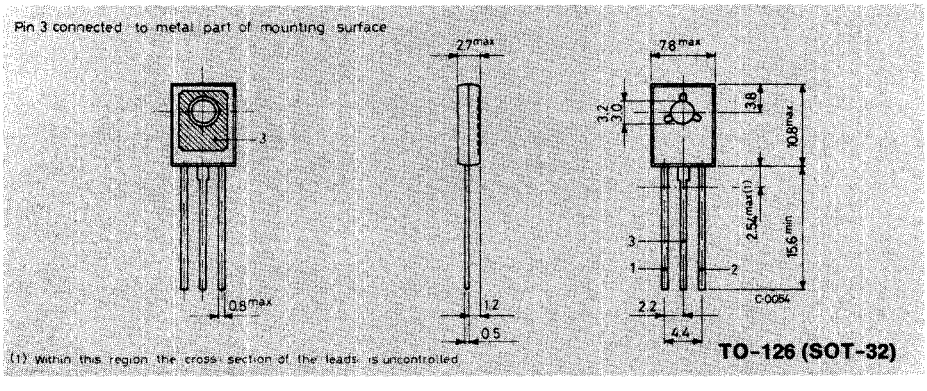
The TDA 1412 can be used for voltage regulation in consumer applications.

ABSOLUTE MAXIMUM RATINGS

V_i	Input supply voltage	27	V
P_{tot}	Total power dissipation at $T_{amb} \leq 25$ °C	1.25	W
	at $T_{case} \leq 25$ °C	14	W
→ T_{stg}, T_j	Storage and junction temperature	-55 to 150	°C
T_{op}	Operating temperature	0 to 70	°C

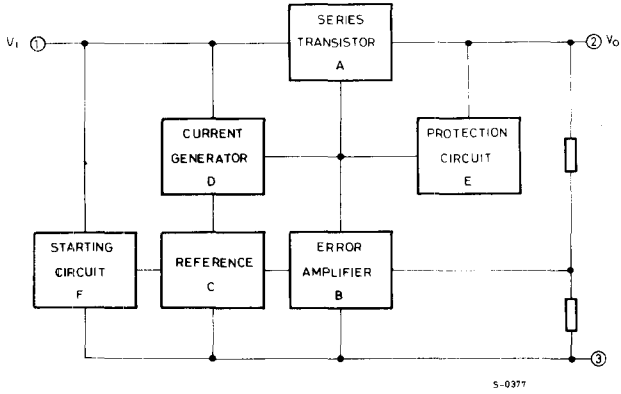
MECHANICAL DATA

Dimensions in mm

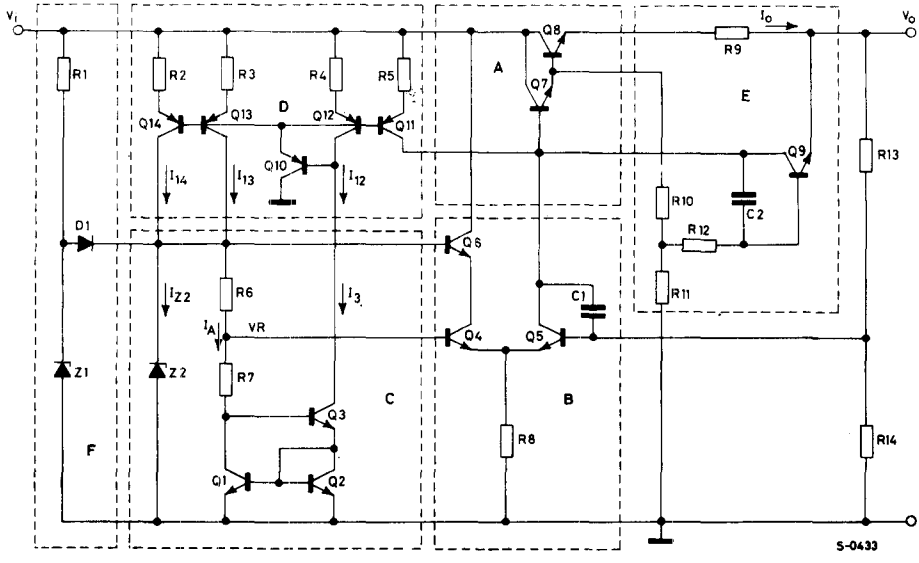


TDA 1412

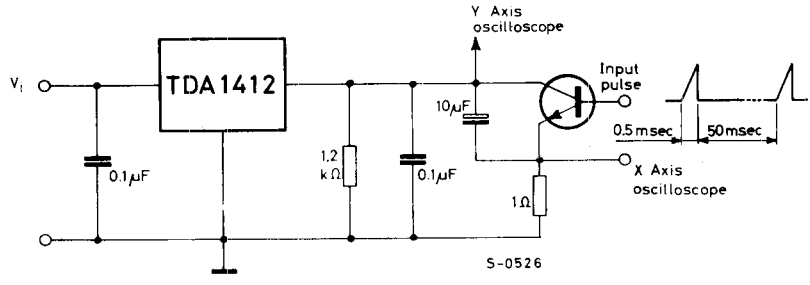
BLOCK DIAGRAM

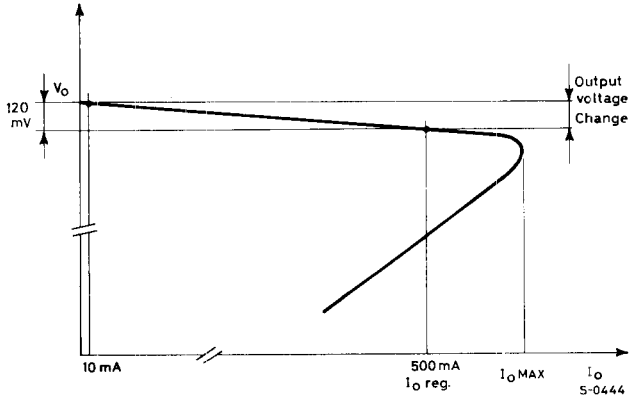


SCHEMATIC DIAGRAM



TEST CIRCUIT with output characteristic





THERMAL DATA

$R_{th\ j\text{-}case}$	Thermal resistance junction-case	max	9	°C/W
$R_{th\ j\text{-}amb}$	Thermal resistance junction-ambient	max	100	°C/W

ELECTRICAL CHARACTERISTICS

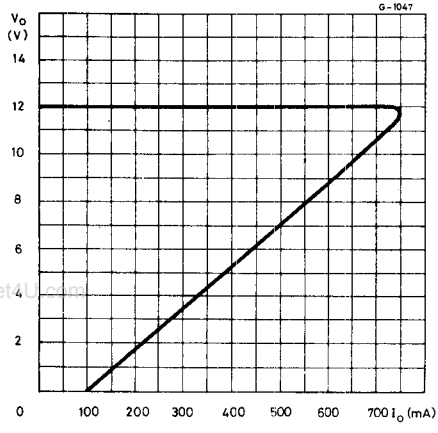
(T_j = 25 °C, V_i = 21 V unless otherwise specified)

Parameter		Test conditions	Min.	Typ.	Max.	Unit
V_o	Output voltage	14.5 V ≤ V_i ≤ 27 V I_o = 10 mA C_L = 10 µF	11.4	12	12.6	V
ΔV_o*	Load regulation	I_o = 10 to 500 mA C_L = 10 µF		0.3	1	%V
I_o*	Regulated output current	$\frac{\Delta V_o}{V_o}$ ≤ 1%	500	720		mA
I_{oMAX}*	Maximum output current	T_{case} = 25 °C T_{case} = 70 °C		0.75 0.8	1	A A
I_{sc}	Output short-circuit current	V_o = 0		100	200	mA
I_d	Quiescent drain current	V_i = 27 V I_o = 0		10		mA
ΔV_o	Line regulation	V_i = 14.5 to 21 V I_o = 10 mA C_L = 10 µF		6	33	mV
$\frac{\Delta V_o}{\Delta T_{amb}}$	Temperature coefficient	I_o = 10 mA C_L = 10 µF T_{amb} = 0 to 70 °C		1.2		mV/°C
e_N	Output noise voltage	I_o = 10 mA C_L** = 20 µF B = 10 Hz to 100 kHz		150		µV
R_o	Output resistance	I_o = 500 mA		20		mΩ
SVR	Supply voltage rejection	V_i = 19 V I_o = 10 mA ΔV_i = 4 V peak to peak f = 100 Hz C_L = 10 µF	46	60		dB

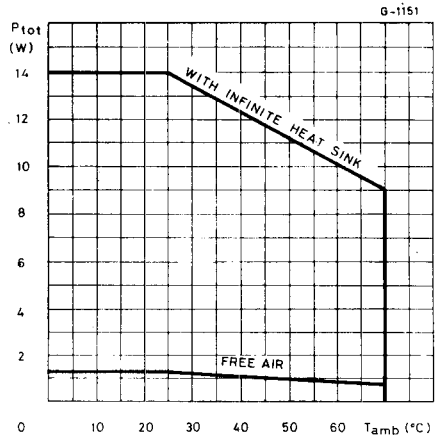
* Refer to the test circuit

** Tantalum capacitor

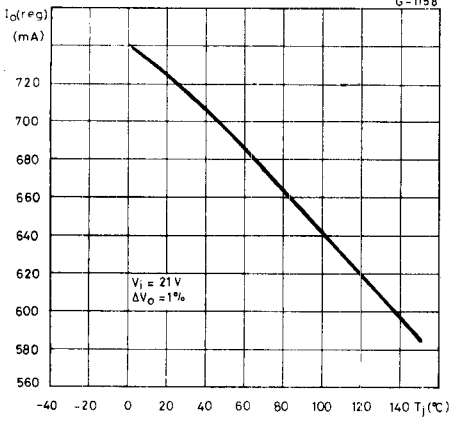
Typical output voltage versus output current



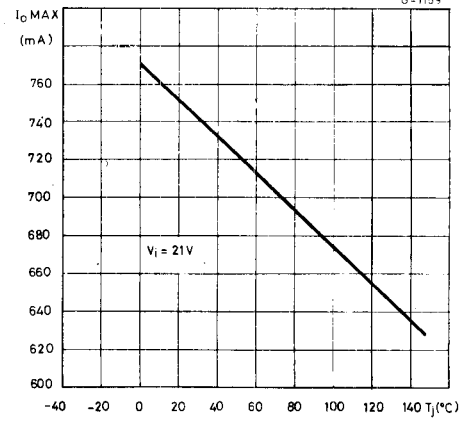
Power rating chart



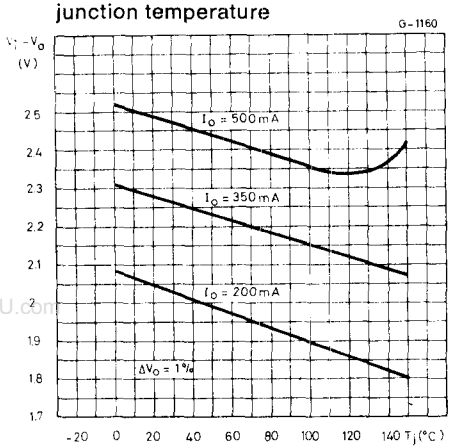
Typical regulated output current versus junction temperature



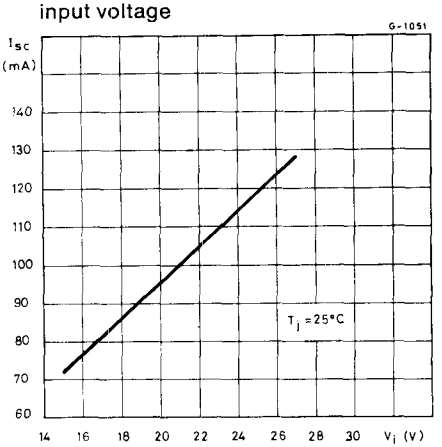
Maximum output current versus junction temperature



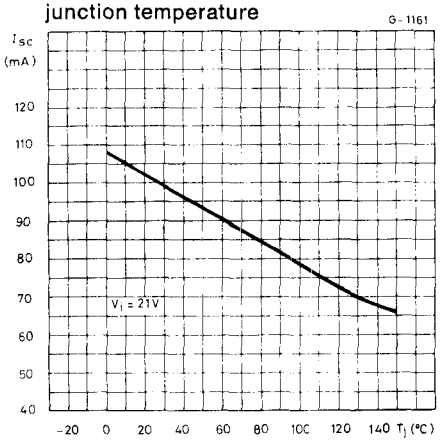
Typical dropout voltage versus junction temperature



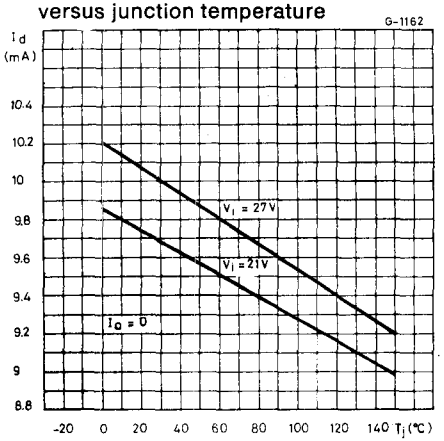
Typical short-circuit current versus input voltage



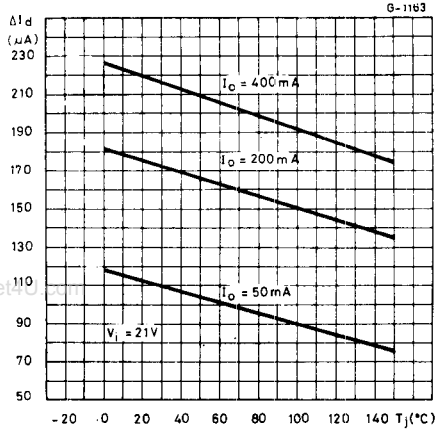
Typical short-circuit current versus junction temperature



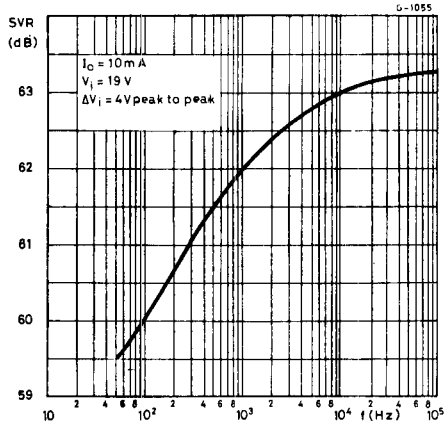
Typical quiescent drain current versus junction temperature



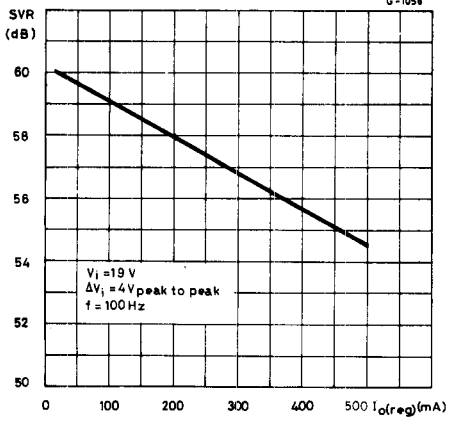
Typical quiescent drain current variation versus junction temperature



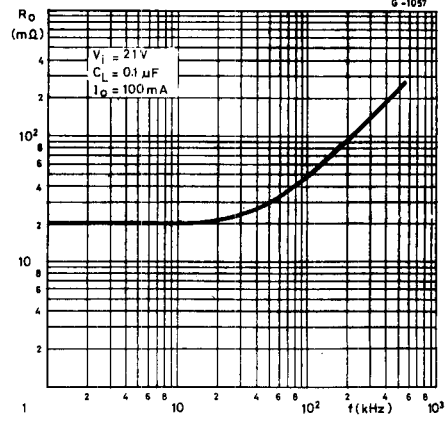
Typical supply voltage rejection versus frequency



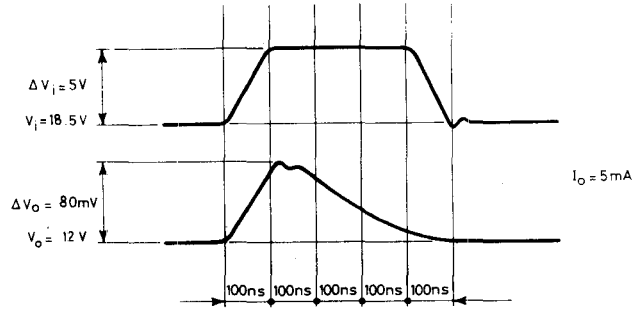
Typical supply voltage rejection versus regulated output current



Typical output resistance versus frequency

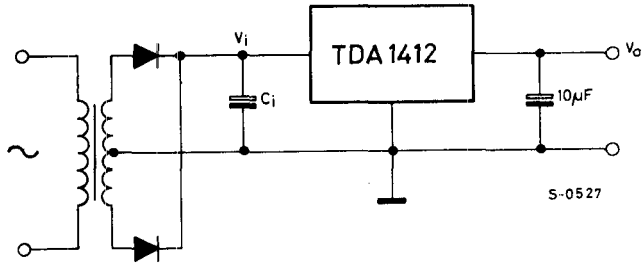


Typical line transient response



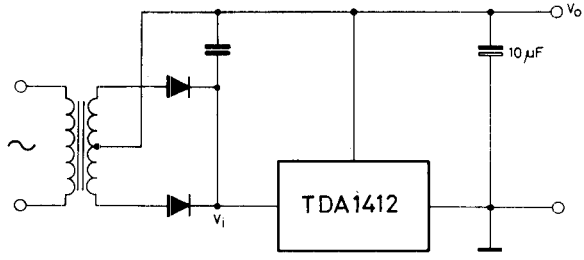
APPLICATION INFORMATION

Typical connection circuit



APPLICATION INFORMATION (continued)

Negative output voltage circuit



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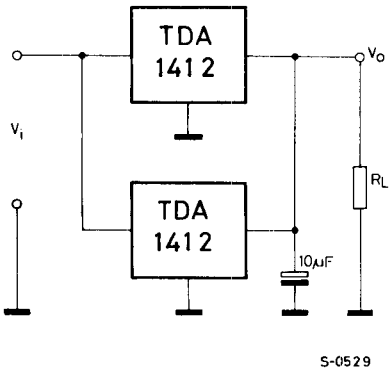
Parallel connected voltage regulators and its output characteristics



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