LINEAR INTEGRATED CIRCUIT

TBA 625A

VOLTAGE REGULATOR

- OUTPUT CURRENT ≧ 100 mA
- TIGHT TOLERANCE for OUTPUT VOLTAGE
- LOAD REGULATION ≦ 1%
- RIPPLE REJECTION 60 dB TYPICAL
- OVERLOAD and SHORT CIRCUIT PROTECTION

The TBA 625A is an integrated monolithic 5 V voltage regulator in TO-39 metal case which can supply more than 100 mA. The device features high temperature stability, internal overload and short circuit protection, low output impedance and excellent transient response. The TBA 625A is intended for use as voltage supply for digital circuits and for any other industrial application.

ABSOLUTE MAXIMUM RATINGS

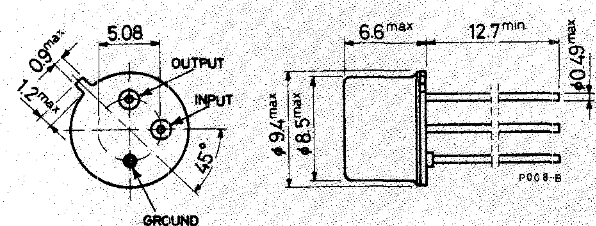
V_i	Input voltage	20	V
P_{tot}	Power dissipation at $T_{amb} = 25$ °C	0.75	W
	at $T_{case} = 25$ °C	4	W
T_{stg}	Storage temperature	-55 to 150	°C
T_j	Junction temperature	175	°C
T_{op}	Operating temperature	0 to 70	°C

ORDERING NUMBER: TBA 625A X5

MECHANICAL DATA

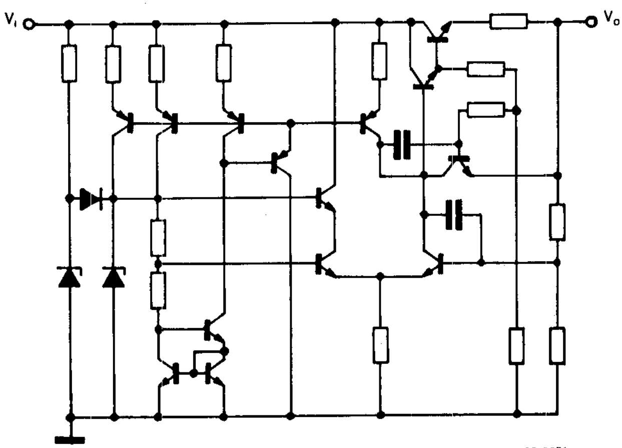
Dimensions in mm

Ground connected to case



TBA 625A

SCHEMATIC DIAGRAM



THERMAL DATA

$R_{th\ j\text{-}case}$	Thermal resistance junction-case	max	37.5	°C/W
$R_{th\ j\text{-}amb}$	Thermal resistance junction-ambient	max	200	°C/W

ELECTRICAL CHARACTERISTICS (T_j = 25 °C unless otherwise specified)

Parameter		Test conditions	Min.	Typ.	Max.	Unit
V_o	Output voltage	V_i = 8 V to 20 V I_o = 5 mA C_L = 10 µF	4.75	5	5.25	V
$\frac{\Delta V_o}{V_o}$	Load regulation	V_i = 8 V to 20 V I_o = 5 mA to 100 mA C_L = 10 µ		0.3	1	%
I_o	Regulated current	V_i = 12 V $\frac{\Delta V_o}{V_o} \leq 1\%$	100	140		mA

ELECTRICAL CHARACTERISTICS (continued)

	Parameter	Test conditions	Min.	Typ.	Max.	Unit
I_o	Max. regulated current	V_i = 12 V	130	150	200	mA
R_o	Output resistance	V_i = 12 V I_o = 5 mA to 100 mA		0.1		Ω
$\frac{\Delta V_o}{V_o}$	Line regulation	V_i = 8 V to 20 V I_o = 5 mA C_L = 10 μF		0.2	1	%
SVR	Supply voltage rejection	V_i = 10 V ΔV_i = 4 V_{pp} I_o = 5 mA C_L = 10 μF f = 100 Hz	46	60		dB
e_N	Output noise voltage	V_i = 12 V I_o = 5 mA C_L = 10 μF B = 10 Hz to 100 kHz		70		μV
I_d	Quiescent drain current	V_i = 20 V I_o = 0	5	9	16	mA
$\frac{\Delta V_o}{\Delta T_{amb}}$	Temperature coefficient	V_i = 12 V I_o = 5 mA C_L = 10 μF T_{amb} = 0 to 70 °C		0.5		mV/°C
I_{sc}	Output short circuit current	V_i = 20 V V_o = 0		45	65	mA

Fig. 1 - Typical output voltage vs output current

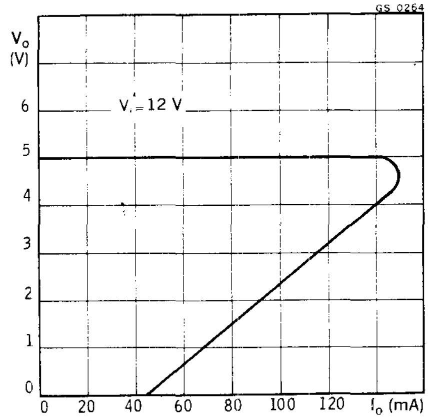


Fig. 2 - Power rating chart

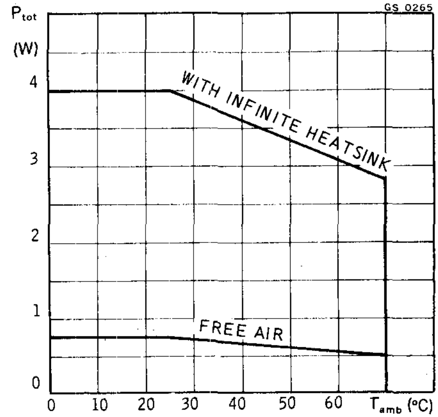


Fig. 3 - Maximum output current vs junction temperature

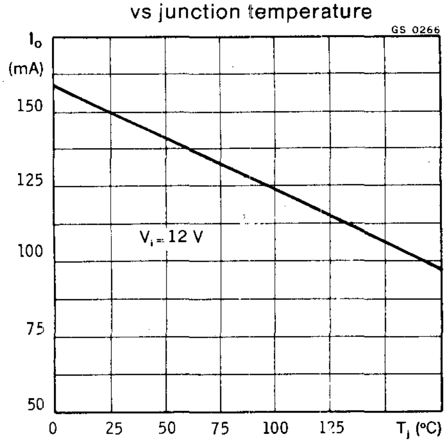


Fig. 4 - Typical ripple rejection vs regulated output current

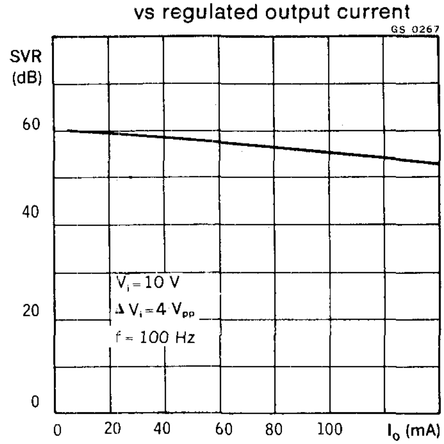


Fig. 5 - Typical ripple rejection vs frequency

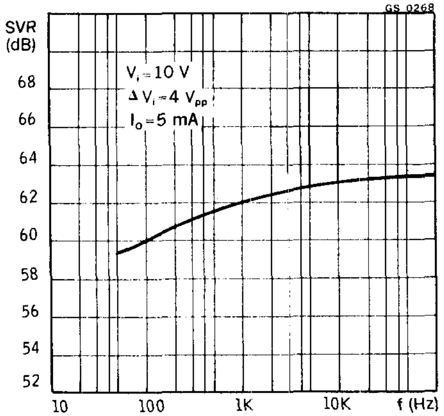


Fig. 6 - Maximum output current vs input voltage

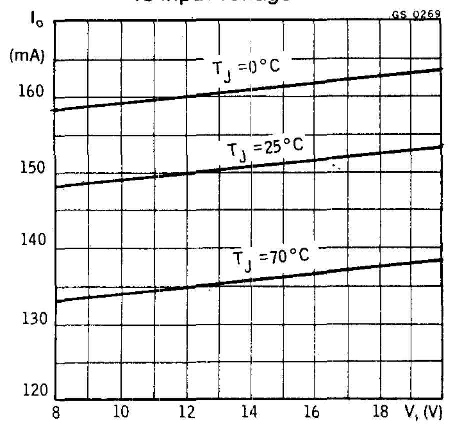


Fig. 7 - Typical short circuit output current vs input voltage

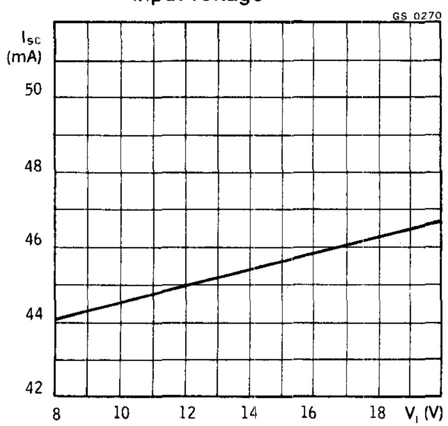


Fig. 8 - Typical short circuit output current vs junction temperature

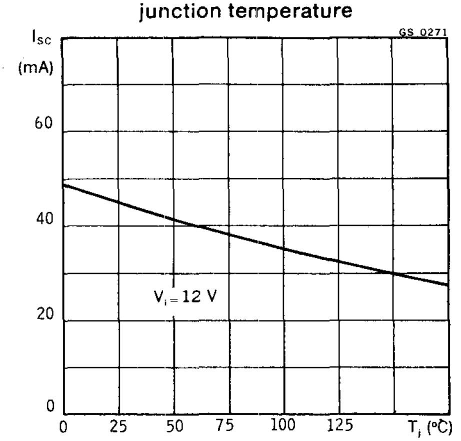


Fig. 9 - Typical dropout voltage vs output current

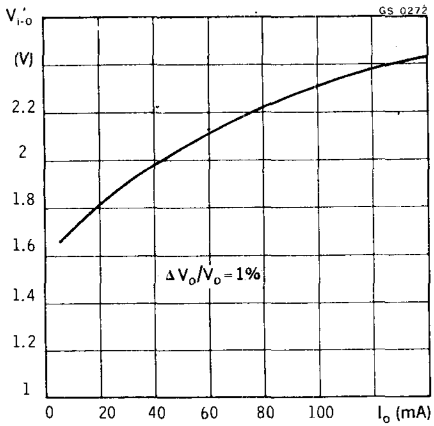


Fig. 10 - Typical quiescent drain current vs junction temperature

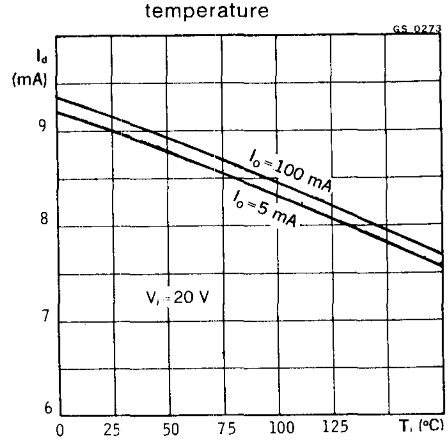


Fig. 11 - Typical quiescent drain current vs input voltage

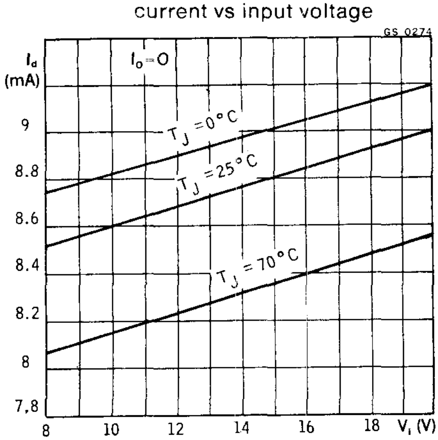
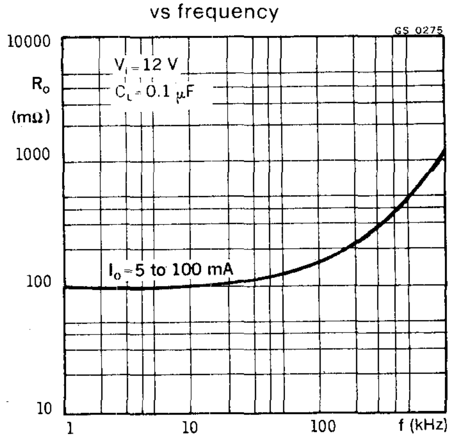
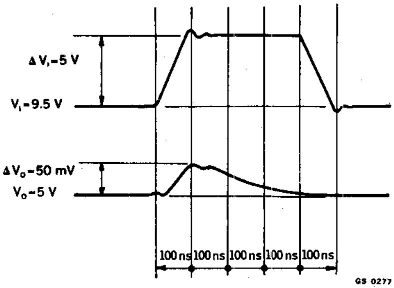


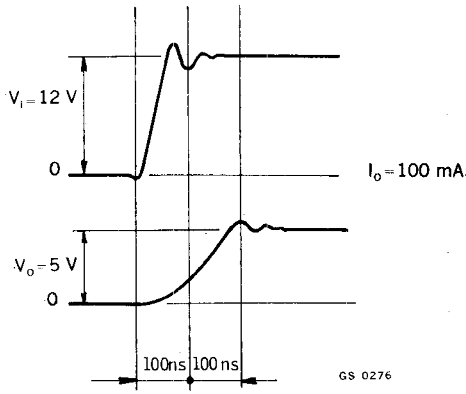
Fig. 12 - Typical output resistance vs frequency



Line transient response
(I_o = 5 mA)



Turn-on time
(I_o = 100 mA)



TYPICAL APPLICATIONS

Fig. 13 - Positive output voltage regulator

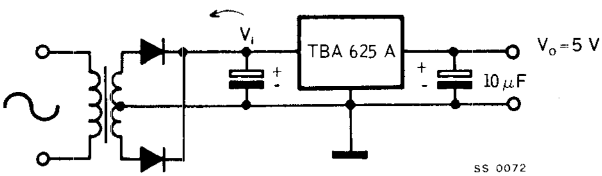


Fig. 14 - Negative output voltage regulator

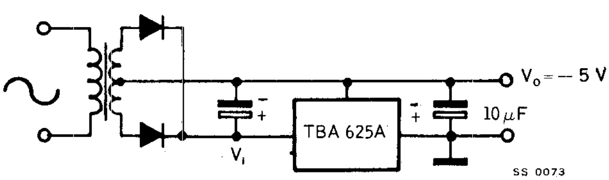
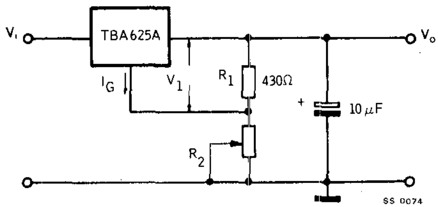


Fig. 15 - Adjustable output voltage regulator



$V_o = V_1 \left(1 + \frac{R_2}{R_1}\right) + I_G R_2$

$V_i = 16$ V
$V_o = 5$ to 9 V
$I_o > 80$ mA
$R_o \simeq 100$ mΩ
R_2 = potentiometer 0 to 250 Ω

Typical adjustable output voltage vs output current

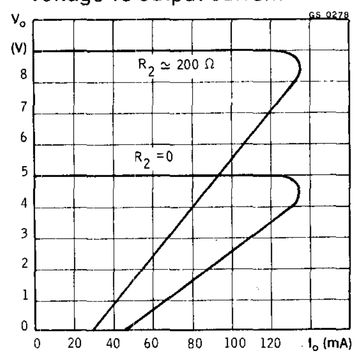
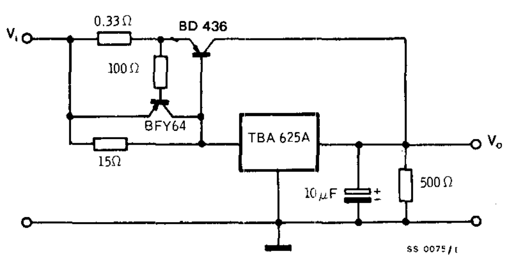


Fig. 16 - PNP current boost circuit



$V_i = 12$ V
$V_o = 5$ V
$I_o = 2$ A
$R_o \simeq 20$ mΩ

Typical output voltage vs output current