



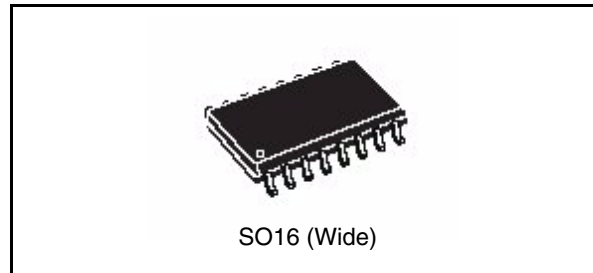
**THE DATASHEET OF  
L2720W13TR**



## Low drop dual power operational amplifiers

### Features

- Output current up to 1 A
- Operates at low voltages
- Single or split supply
- Large common-mode and differential-mode range
- Low input-offset voltage
- Ground compatible inputs
- Low saturation voltage
- Thermal shutdown
- Clamp diode



### Description

The L2720W is a monolithic integrated circuit in SO16 (Wide) package, intended for use as a power operational amplifier in a wide range of applications including servo amplifiers and power supplies.

It is particularly suitable for driving coils, inductive loads and for use in motors.

The high gain and high output power capability provide superior performance whenever an operational amplifier/power booster combination is required.

**Table 1. Device summary**

Order code	Package	Packaging
L2720W	SO16 (Wide)	Tube
L2720W13TR	SO16 (Wide)	Tape and reel

# 1 Connection diagrams

Figure 1. Block diagram

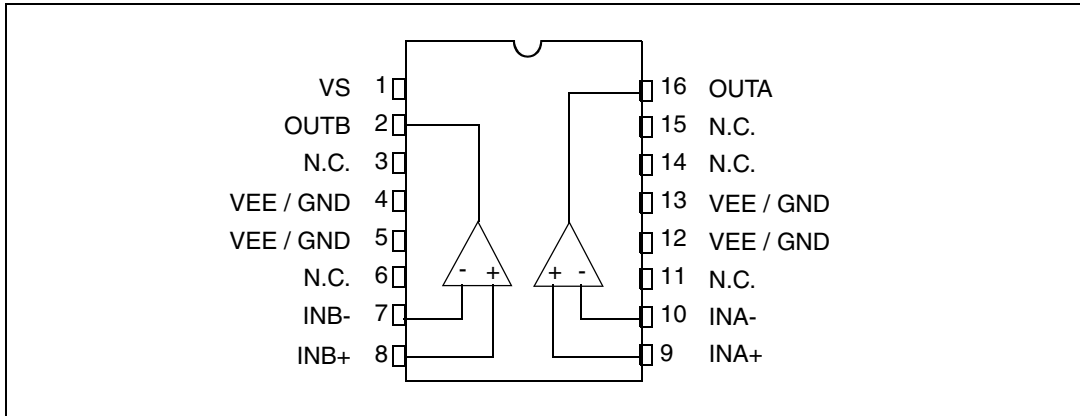
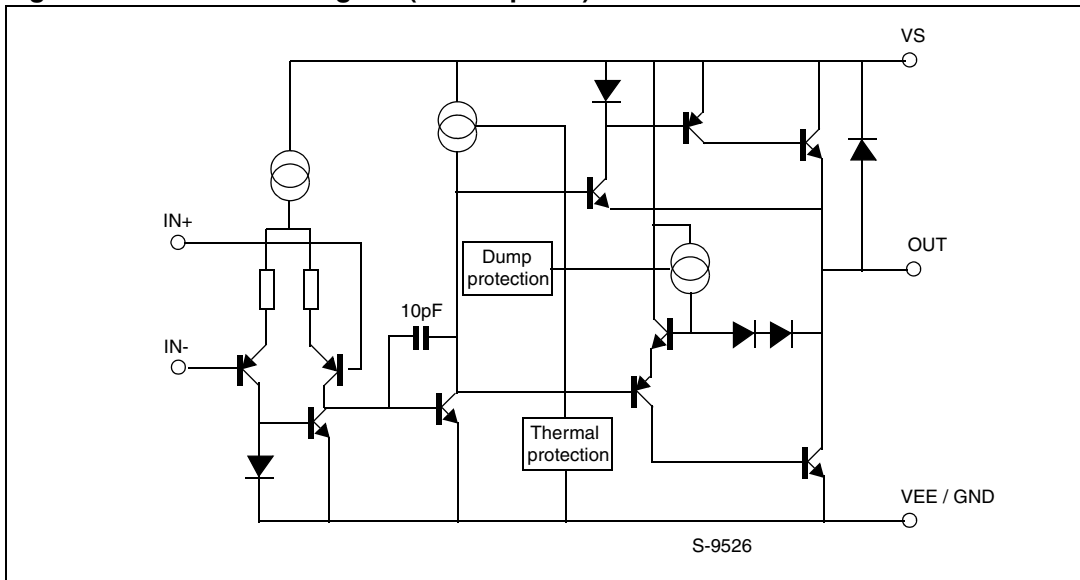
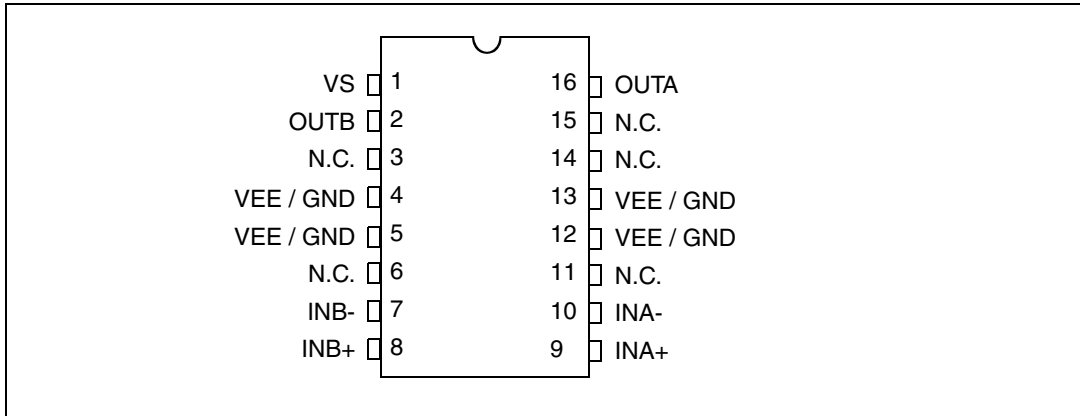


Figure 2. Schematic diagram (one amplifier)



## 2 Pin out

**Figure 3. Pin connection (top view)**



**Table 2. Pin description**

Pin	Name	Type	Description
1	VS	Power	Power supply positive
2	OUTB	Output	Amplifier B output
3	N.C.	-	No internal connection
4	VEE / GND	Power	Power supply negative or ground
5	VEE / GND	Power	Power supply negative or ground
6	N.C.	-	No internal connection
7	INB-	Input	Amplifier B input
8	INB+	Input	Amplifier B input
9	INA+	Input	Amplifier A input
10	INA-	Input	Amplifier A input
11	N.C.	-	No internal connection
12	VEE / GND	Power	Power supply negative or ground
13	VEE / GND	Power	Power supply negative or ground
14	N.C.	-	No internal connection
15	N.C.	-	No internal connection
16	OUTA	Output	Amplifier A output

## 3 Electrical specifications

### 3.1 Absolute maximum ratings

**Table 3. Absolute maximum ratings**

Pin/symbol	Description	Min	Max	Unit
$V_S$	Supply voltage	-	28	V
$V_{S-PK}$	Peak supply voltage (50 ms)	-	50	V
$V_i$	Input voltage range	-	$V_S$	V
$V_i$	Differential input voltage range	-	$\pm V_S$	V
$I_O$	DC output current	-	1	A
$I_{O-PK}$	Peak output current (non repetitive)	-	1.5	A
$T_{op}$	Operating ambient temperature range	-40	125	°C
$T_{stg}, T_j$	Storage and junction temperature range	-40	150	°C

### 3.2 Thermal data

**Table 4. Thermal data**

Device	Parameter	Min	Typ	Max	Unit
	$R_{th\ j-amb}$ Thermal resistance junction to ambient <sup>(1)</sup>	-	65	-	°C/W
	$R_{th\ j-case}$ Thermal resistance junction to case pins <sup>(2)</sup>	-	12	-	°C/W

1. On double layer PCB with 4 cm<sup>2</sup> copper dissipating area

2. Referred to pins 4, 5, 12 and 13.

### 3.3 Recommended operating conditions

**Table 5. Recommended operating conditions**

Symbol	Parameter	Min	Typ	Max	Unit
$V_S$	Positive single power supply	4.0	-	28	V
	Positive split power supply	2.0	-	14	V
$V_E$	Negative single power supply	-	0	-	V
	Negative split power supply	-2.0	-	-14	V
$V_{IN}$	Input voltage	-	-	$V_S$ to $V_E$	V

### 3.4 Electrical characteristics

The electrical specifications in [Table 6](#) below are given for operation under the conditions  $V_S = 24\text{ V}$ ,  $T_{\text{amb}} = -40\text{ °C}$  to  $125\text{ °C}$  and RI connected to GND, unless otherwise specified

**Table 6. Electrical characteristics**

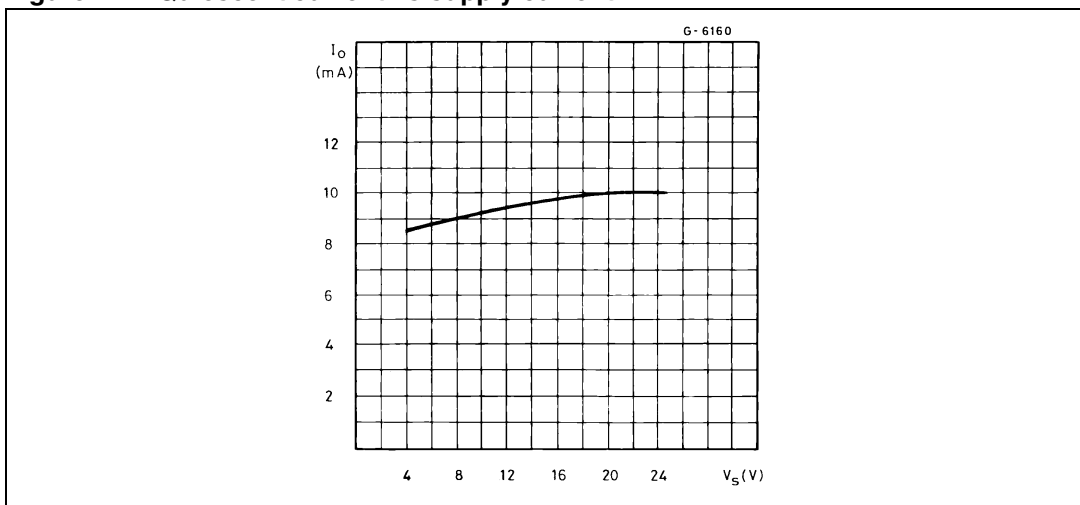
Symbol	Parameter	Conditions	Min	Typ	Max	Unit	
$I_s$	Quiescent current	$V_O = V_S / 2$	$T_{\text{amb}} = 25\text{ °C}$	-	10	15	mA
			-	-	10	18	
$I_{\text{ib}}$	Input bias current	$V_{\text{CM}} = 0$	$T_{\text{amb}} = 25\text{ °C}$	-	0.2	1	$\mu\text{A}$
			-	-	0.2	1	
$I_{\text{ob}}$	Input offset current	$V_{\text{CM}} = 0$	$T_{\text{amb}} = 25\text{ °C}$	-	-	100	nA
			-	-	-	100	
$V_{\text{os}}$	Input offset voltage	$T_{\text{amb}} = 25\text{ °C}$	-	-10	-	10	mV
			-	-10	-	10	
$\Delta V_{\text{os}}/\Delta T$	Average temperature coefficient of $V_{\text{os}}$	-	-	20	-	$\mu\text{V}/\text{°C}$	
SR	Slew rate	$V_{\text{in}} = -10\text{ V}$ to $+10\text{ V}$ , $R_L = 2\text{ k}\Omega$ , $C_L = 100\text{ pF}$ , $A_v = -1$ , $T_{\text{amb}} = 25\text{ °C}$	-	2	-	$\text{V}/\mu\text{s}$	
B	Gain-bandwidth product	-	-	1.2	-	MHz	
$G_v$	Open loop voltage gain	$f = 100\text{ Hz}$	70	80	-	dB	
		$f = 1\text{ kHz}$	-	60	-		
CMRR	Common mode rejection ratio	$f = 1\text{ kHz}$	66	84	-	dB	
SVRR	Supply voltage rejection ratio	$f = 100\text{ Hz}$ $R_G = 10\text{ k}\Omega$ $V_R = 0.5\text{ V}$	$V_S = 24\text{ V}$	-	70	-	dB
			$V_S = \pm 12\text{ V}$	60	75	-	
$V_{\text{DROP(H)}}$	Drop voltage high	$I_p = 100\text{ mA}$	$T_{\text{amb}} = 25\text{ °C}$	-	0.7	1	V
			-	-	0.8	1.5	
		$I_p = 1\text{ A}$	$T_{\text{amb}} = 25\text{ °C}$	-	1.0	1.5	
			-	-	1.1	1.5	
$V_{\text{DROP(L)}}$	Drop voltage low	$I_p = 100\text{ mA}$	$T_{\text{amb}} = 25\text{ °C}$	-	0.3	0.7	V
			-	-	0.4	1	
		$I_p = 1\text{ A}$	$T_{\text{amb}} = 25\text{ °C}$	-	0.5	1	
			-	-	1.3	1.5	
$C_s$	Channel separation	$f = 1\text{ kHz}$ ; $R_L = 10\text{ }\Omega$ ; $G_v = 30\text{ dB}$	$V_S = 24\text{ V}$	-	60	-	dB
			$V_S = 6\text{ V}$	-	60	-	
$e_N$	Input noise voltage	$B = 22\text{ Hz}$ to $22\text{ kHz}$ , $T_{\text{amb}} = 25\text{ °C}$	-	10	-	$\mu\text{V}$	

**Table 6. Electrical characteristics** (continued)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$I_N$	Input noise current	$B = 22 \text{ Hz to } 22 \text{ kHz}$ , $T_{\text{amb}} = 25 \text{ }^\circ\text{C}$	-	200	-	pA
$\phi_m$	Phase margin	$R_L = 2 \text{ k}\Omega$ , $C_L = 100 \text{ pF}$ , $T_{\text{amb}} = 25 \text{ }^\circ\text{C}$	-	65	-	$^\circ\text{C}$
$A_m$	Gain margin	$R_L = 2 \text{ k}\Omega$ , $C_L = 100 \text{ pF}$ , $T_{\text{amb}} = 25 \text{ }^\circ\text{C}$	-	15	-	dB

### 3.5 Characterization curves

**Figure 4. Quiescent current vs supply current**



**Figure 5. Open loop gain vs frequency**

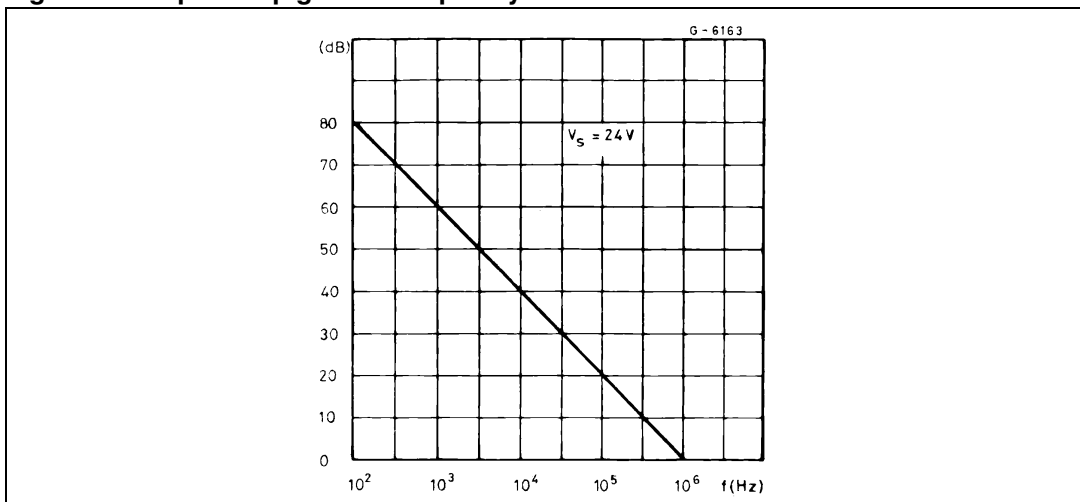


Figure 6. Common mode rejection vs frequency

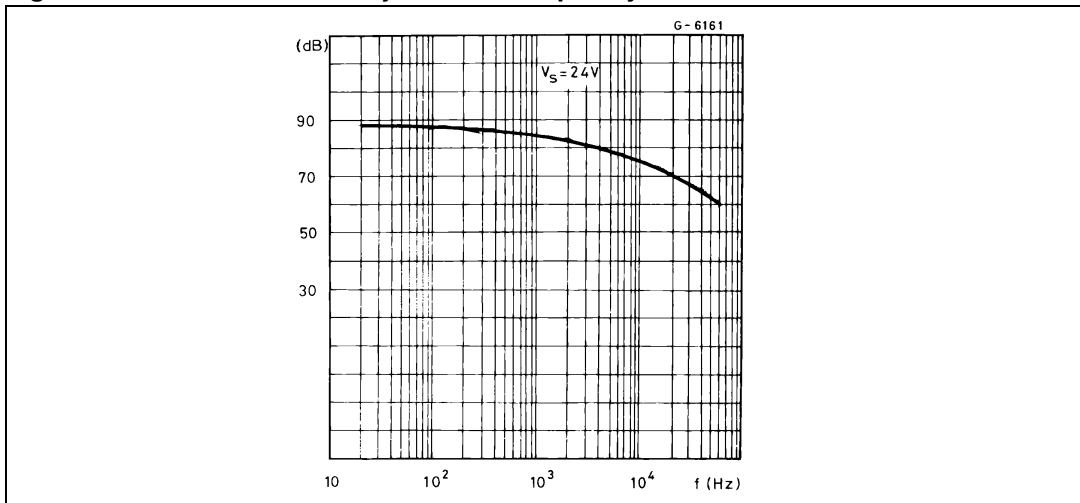


Figure 7. Output swing vs load current (V<sub>S</sub> = ±5 V)

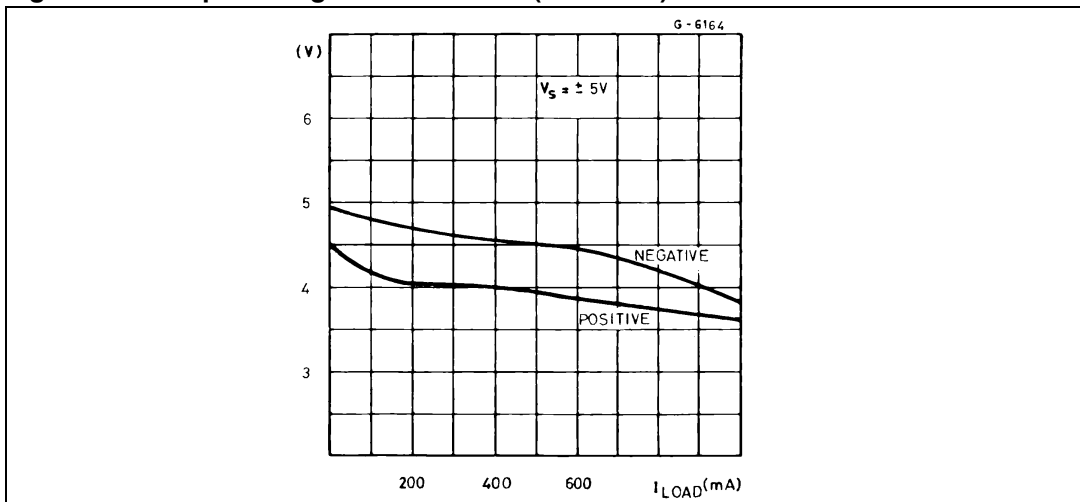


Figure 8. Output swing vs load current (V<sub>S</sub> = ±12 V)

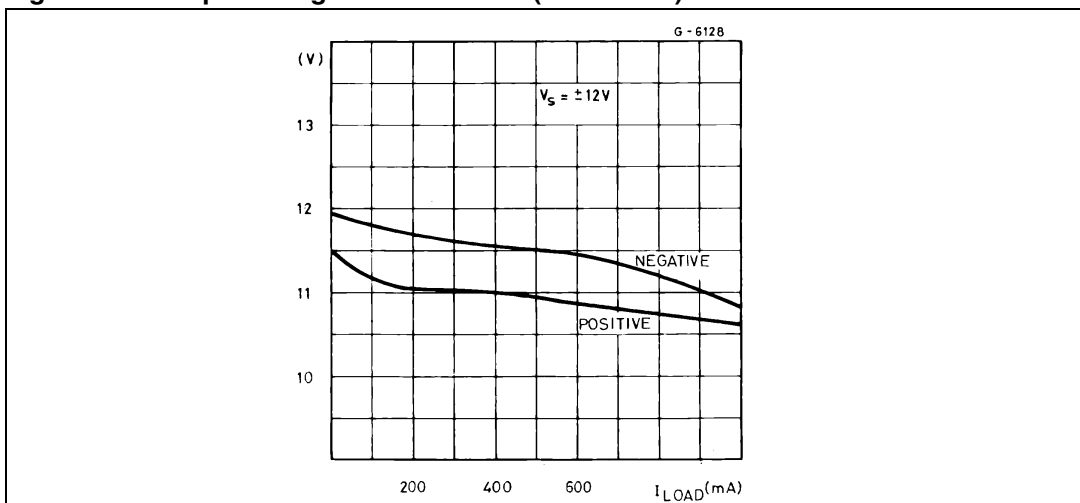


Figure 9. Supply voltage rejection vs frequency

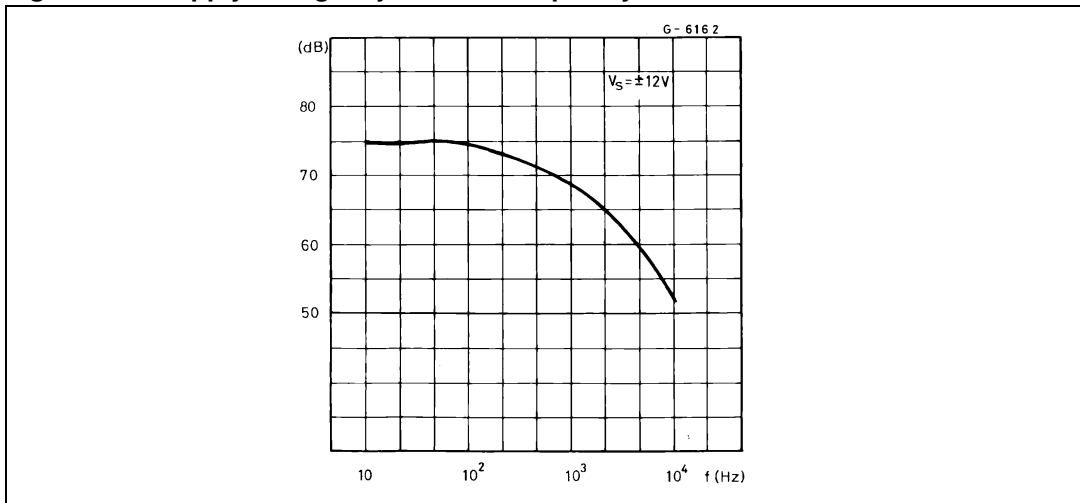


Figure 10. Channel separation vs frequency

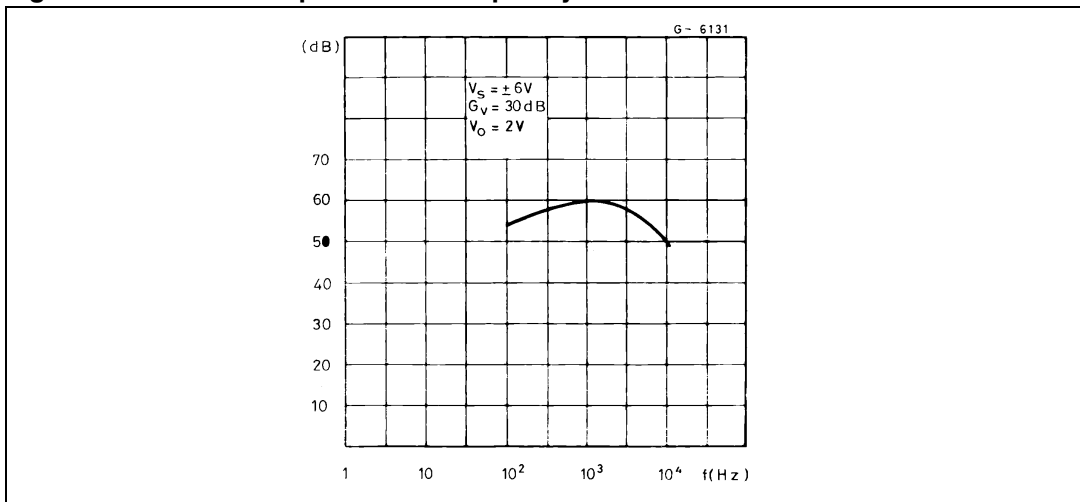


Figure 11. Voltage gain and phase vs frequency

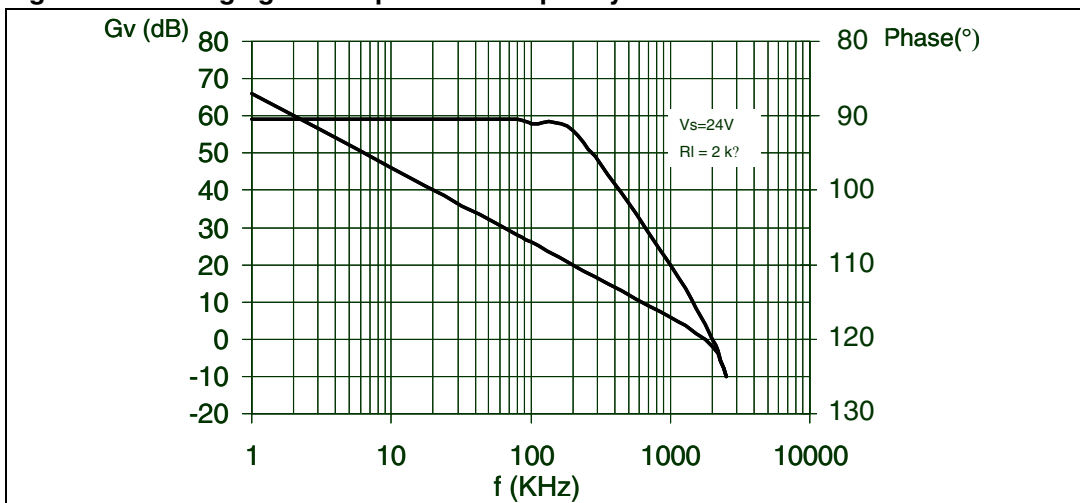
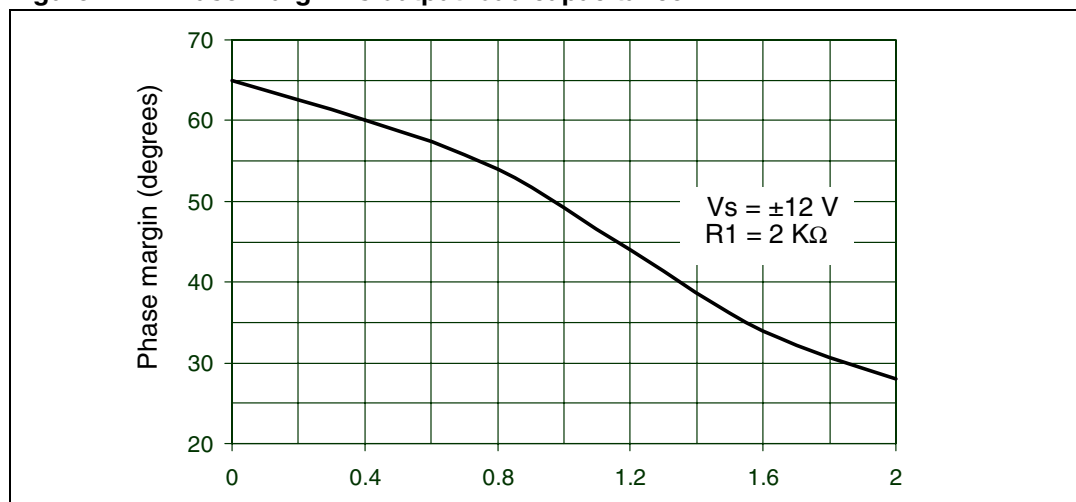


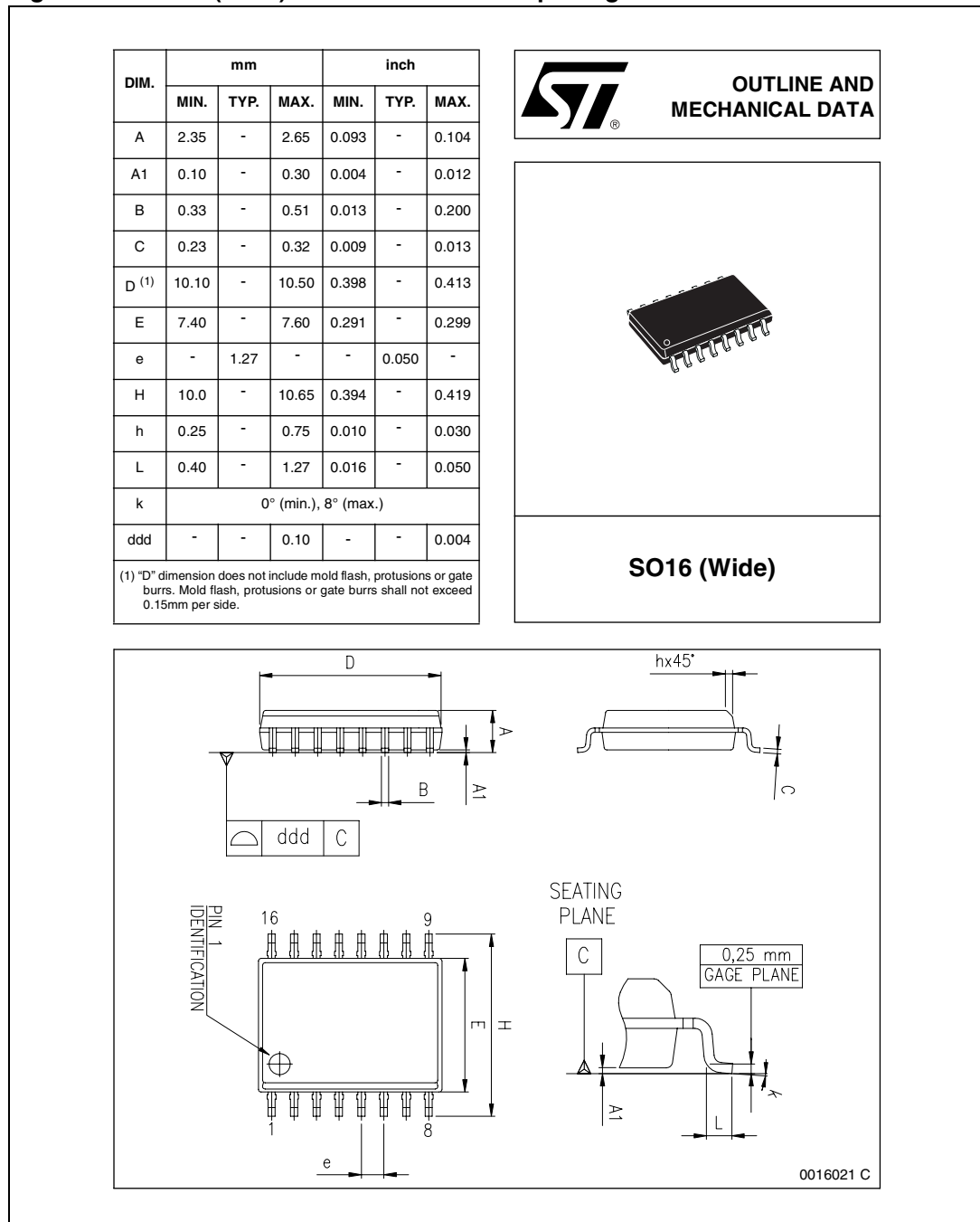
Figure 12. Phase margin vs output load capacitance



# 4 Package mechanical data

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**Figure 13. SO16 (Wide) mechanical data and package dimensions**



## 5 Revision history

**Table 7. Document revision history**

Date	Revision	Changes
04-Apr-2007	1	Initial release.
03-Sep-2010	2	Complete update and change in presentation

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