

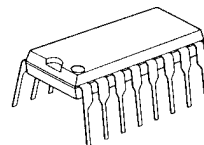
## BRUSH LESS DC MOTOR PRE-DRIVER

### ■GENERAL DESCRIPTION

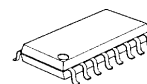
The **NJM2624A** is a 3-phase brushless DC motor pre-driver which requires external power-transistors suited to drive current of the motor.

The Run Enable function is used as PWM control besides of ON/OFF switched function.

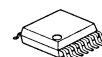
### ■PACKAGE OUTLINE



**NJM2624AD**



**NJM2624AM**

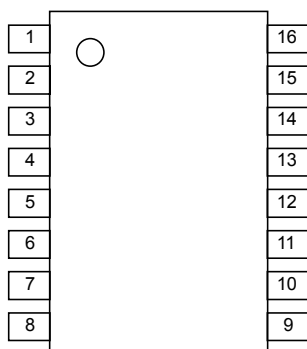


**NJM2624AV**

### ■FEATURES

- Operating Voltage (V<sup>+</sup>=4.5V to 18V)
- Low Operating Current (10mA max.)
- Run Enable
- Forward or Reverse Direction
- Output Switch Current (90mA typ.)
- Bipolar Technology
- Package Outline DIP16, DMP16, SSOP16

### ■PIN CONFIGURATION

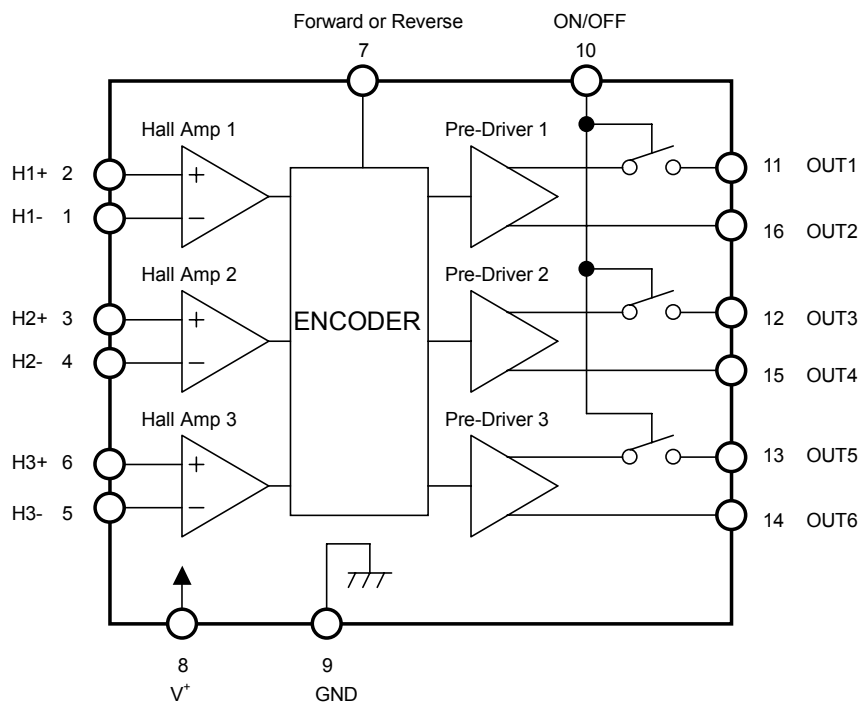


### PIN FUNCTION

1.H1-	9.GND
2.H1+	10.ON/OFF
3.H2+	11.OUT1
4.H2-	12.OUT3
5.H3-	13.OUT5
6.H3+	14.OUT6
7.FR	15.OUT4
8.V <sup>+</sup>	16.OUT2

# NJM2624A

## ■BLOCK DIAGRAM



## ■ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	$V^+$	20	V
Output Current	$I_O$	100	mA
Power Dissipation	$P_D$	(DIP16) 700 (DMP16) 350 (SSOP16) 300	mW
Operating Temperature Range	$T_{opr}$	-25 ~ +85	°C
Storage Temperature Range	$T_{stg}$	-40 ~ +150	°C

## ■ELECTRICAL CHARACTERISTICS (V<sup>+</sup>=12V, Ta=25°C)

### Total Device

PARAMETER	SYMBOL	TEST CONDITONS	MIN.	TYP.	MAX.	UNIT
Supply Voltage	V <sup>+</sup>		4.5	—	18	V
Supply Current	I <sub>CC</sub>	RL=∞ ON/OFF Terminal=OPEN	—	3.7	10	mA

### Hall Sensor Section

Input Offset Voltage	V <sub>IO</sub>	RL=470Ω	-4.2	—	4.2	mV
Input Common mode Voltage range	V <sub>ICM</sub>	RL=470Ω	1.5	—	10.5	V
Input Bias Current	I <sub>B</sub>		—	—	600	nA

### Output Section

Output Voltage 1	V <sub>OUT1</sub>	RL=470Ω, V <sup>+</sup> =12V	8.9	9.5	—	V
Output Voltage 2	V <sub>OUT2</sub>	RL=470Ω, V <sup>+</sup> =5V	—	3.5	—	V
Maximum Output Current 1	I <sub>OUT1</sub>	RL=100Ω, V <sup>+</sup> =12V	50	90	—	mA
Maximum Output Current 2	I <sub>OUT2</sub>	RL=100Ω, V <sup>+</sup> =5V	—	30	—	mA
Output Leak Current	I <sub>LEAK</sub>		—	—	5	μA

### Run Enable Section

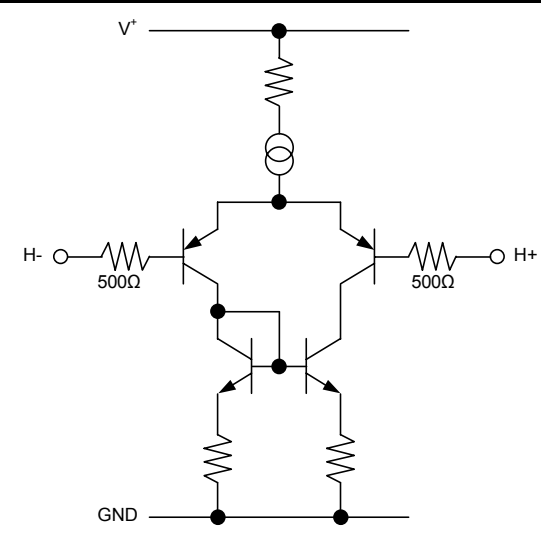
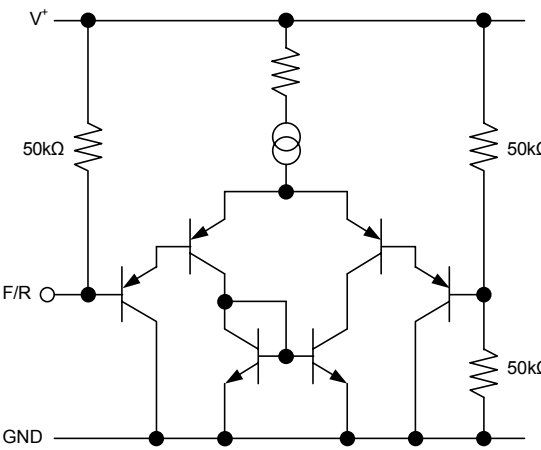
Run Enable Voltage	V <sub>ON</sub>	RL=470Ω	1/2V <sup>+</sup> +0.5	—	—	V
Run Disable Voltage	V <sub>OFF</sub>	RL=470Ω	—	—	1/2V <sup>+</sup> -0.5	V
Output Voltage Undefined Area	V <sub>O-undef</sub>	RL=470Ω	1/2V <sup>+</sup> -0.5	1/2V <sup>+</sup>	1/2V <sup>+</sup> +0.5	V
Source Current 1	I <sub>ON1</sub>	ON/OFF Terminal=GND	—	250	400	μA

### Forward or Reverse Direction Section

Forward Direction	V <sub>F</sub>	RL=470Ω	1/2V <sup>+</sup> +0.5	—	—	V
Reverse Direction	V <sub>R</sub>	RL=470Ω	—	—	1/2V <sup>+</sup> -0.5	V
F/R Logic Undefined Area	V <sub>SW-undef</sub>	RL=470Ω	1/2V <sup>+</sup> -0.5	1/2V <sup>+</sup>	1/2V <sup>+</sup> +0.5	V
Source Current 2	I <sub>ON2</sub>	Forward or Reverse Terminal=GND	—	250	400	μA

# NJM2624A

## ■TERMINAL DESCRIPTION

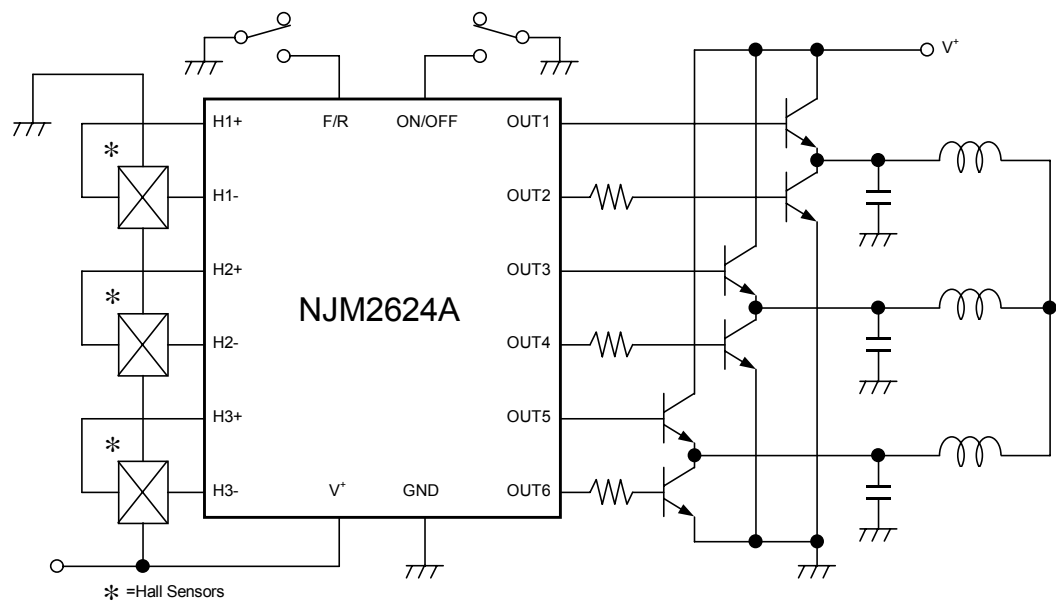
Pin No,	SYMBOL	FUNCTION	INSIDE EQUIVALENT CIRCUIT
2	H1+	Sensor Input 1 Non-Inverting Terminal	 <p>The diagram shows the internal equivalent circuit for the sensor input terminals. It features a central differential pair of transistors. The non-inverting inputs (H1+, H2+, H3+) are connected to the bases of the top transistors through 500Ω resistors. The inverting inputs (H1-, H2-, H3-) are connected to the bases of the bottom transistors through 500Ω resistors. The emitters of the bottom transistors are connected to GND through resistors. The collector of the top transistor is connected to V+ through a resistor and a diode. The collector of the bottom transistor is connected to GND through a resistor.</p>
3	H2+	Sensor Input 2 Non-Inverting Terminal	
6	H3+	Sensor Input 3 Non-Inverting Terminal	
1	H1-	Sensor Input 1 Inverting Terminal	
4	H2-	Sensor Input 2 Inverting Terminal	
5	H3-	Sensor Input 3 Inverting Terminal	
7	F/R	Forward or Reverse Direction Terminal	 <p>The diagram shows the internal equivalent circuit for the F/R direction terminal. It features a central differential pair of transistors. The F/R input is connected to the bases of the top transistors through a 50kΩ resistor. The emitters of the bottom transistors are connected to GND through resistors. The collector of the top transistor is connected to V+ through a resistor and a diode. The collector of the bottom transistor is connected to GND through a resistor.</p>

## ■TERMINAL DESCRIPTION

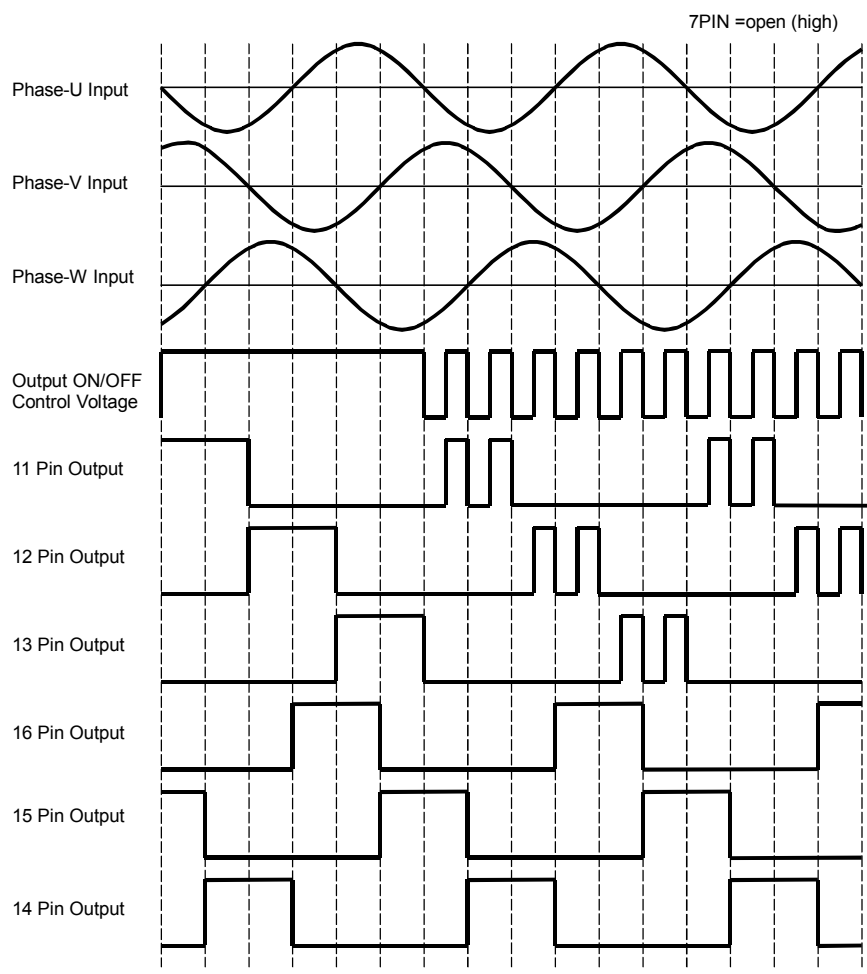
Pin No,	SYMBOL	FUNCTION	INSIDE EQUIVALENT CIRCUIT
8	V <sup>+</sup>	Power Supply	—
9	GND	Ground	—
10	ON/OFF	Output Run Enable Terminal	
11 16 12 15 13 14	OUT1 OUT2 OUT3 OUT4 OUT5 OUT6	Internal Switching Transistor Emitter Follower	

# NJM2624A

## TYPICAL APPLICATION

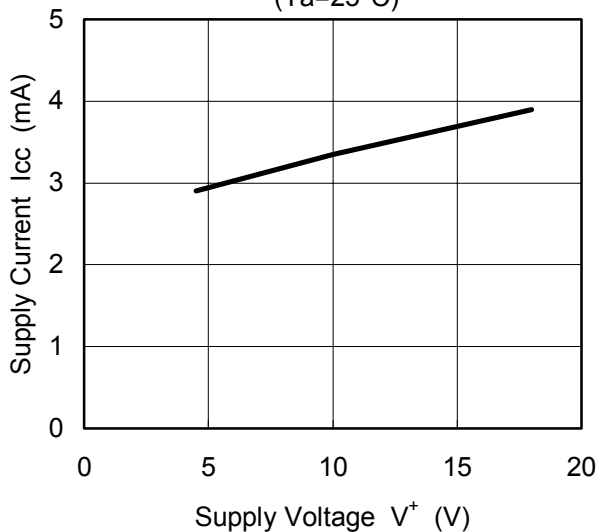


## TIMING CHART

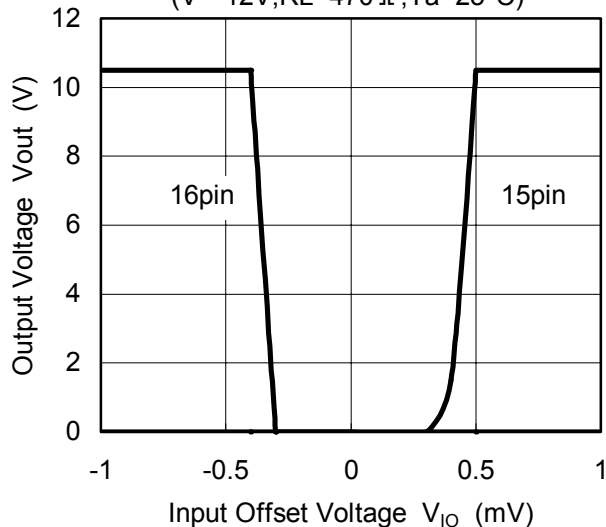


## TYPICAL CHARACTERISTICS

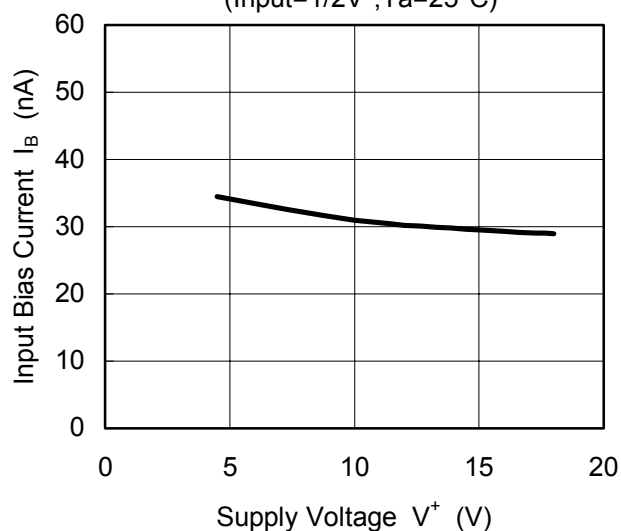
Supply Current vs. Supply Voltage  
( $T_a=25^\circ\text{C}$ )



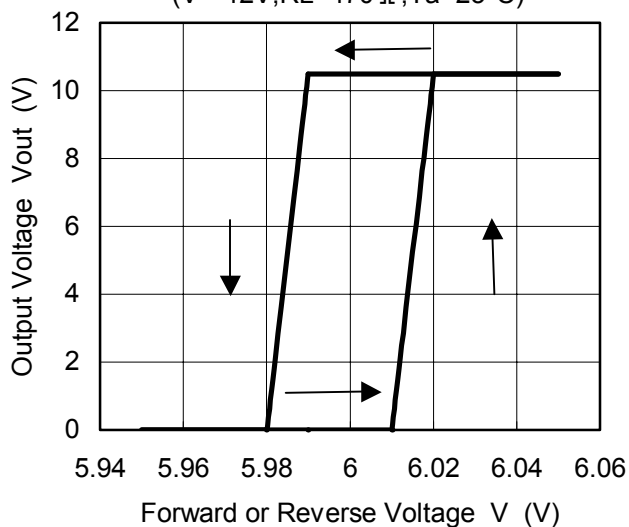
Input vs. Output (Offset)  
( $V^+=12\text{V}, R_L=470\ \Omega, T_a=25^\circ\text{C}$ )



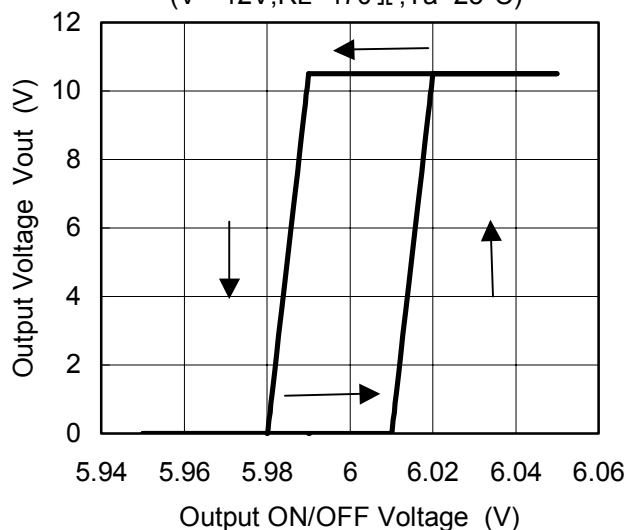
Input Bias Current vs. Supply Voltage  
(Input= $1/2V^+$ ,  $T_a=25^\circ\text{C}$ )



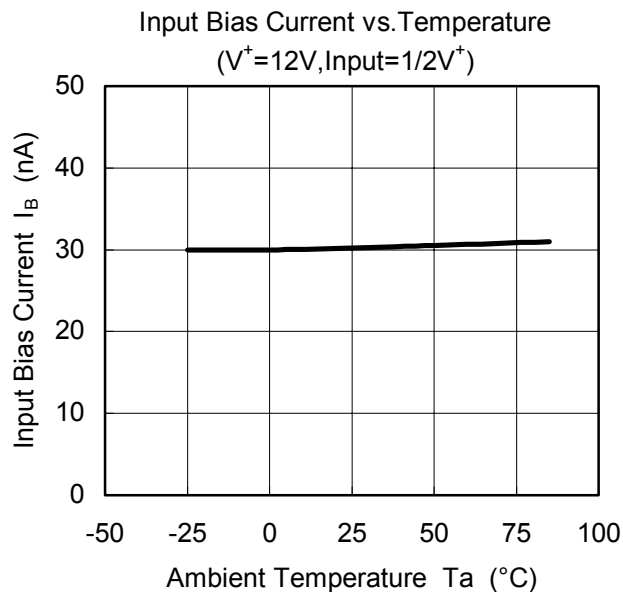
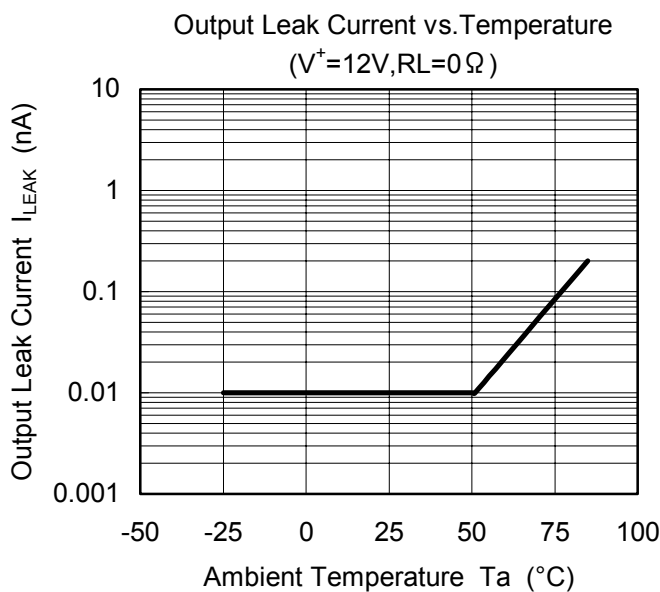
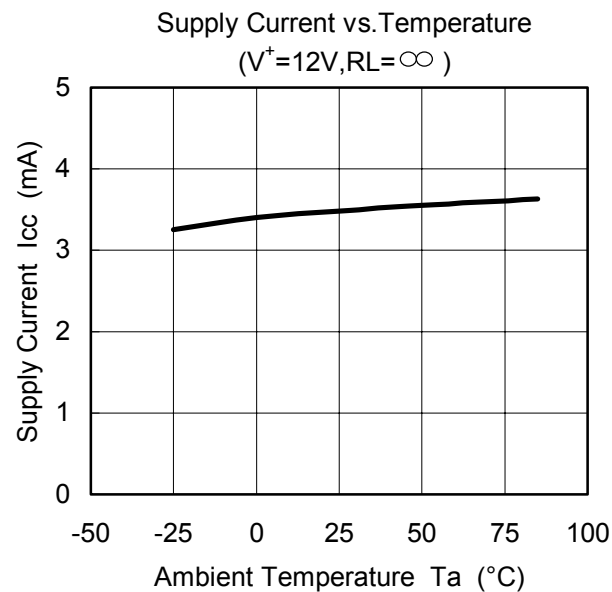
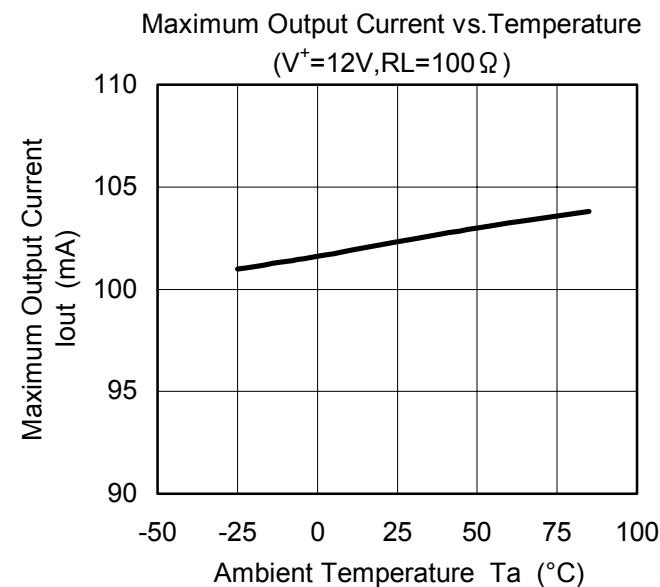
Output Voltage vs. Forward or Reverse Voltage  
( $V^+=12\text{V}, R_L=470\ \Omega, T_a=25^\circ\text{C}$ )



Output Voltage vs. Output ON/OFF Voltage  
( $V^+=12\text{V}, R_L=470\ \Omega, T_a=25^\circ\text{C}$ )



## TYPICAL CHARACTERISTICS



**[CAUTION]**

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