

Internal 40V MOSFET Switching Regulator IC for Buck Converter

■ GENERAL DESCRIPTION

The **NJW4150A** is a buck converter with **40V/300mA** MOSFET. It corresponds to high oscillating frequency, and Low ESR Output Capacitor (MLCC) within wide input range from 6.2V to 40V. Therefore, the **NJW4150A** can realize downsizing of an application with a few external parts.

Also, it has a soft start function, an over current protection and a thermal shutdown circuit.

It is suitable for logic voltage generation from high voltage that Car Accessory, Office Automation Equipment, Industrial Instrument and so on.

■ PACKAGE OUTLINE



NJW4150ARB1

■ FEATURES

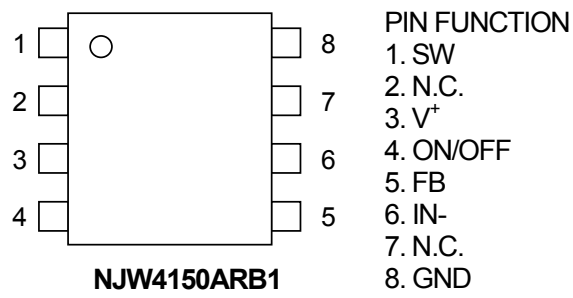
- Maximum Rating Input Voltage 45V
- Wide Operating Voltage Range 6.2V to 40V
- Switching Current 450mA min.
- PWM control
- Correspond to Ceramic Capacitor (MLCC)
- Oscillating Frequency 1MHz typ. (A ver.)
- Soft Start Function 4ms typ.
- UVLO (Under Voltage Lockout)
- Over Current Protection
- Thermal Shutdown Protection
- Standby Function
- Package Outline NJW4150ARB1: MSOP8(TVSP8)* *MEET JEDEC MO-187-DA THIN TYPE

■ PRODUCT CLASSIFICATION

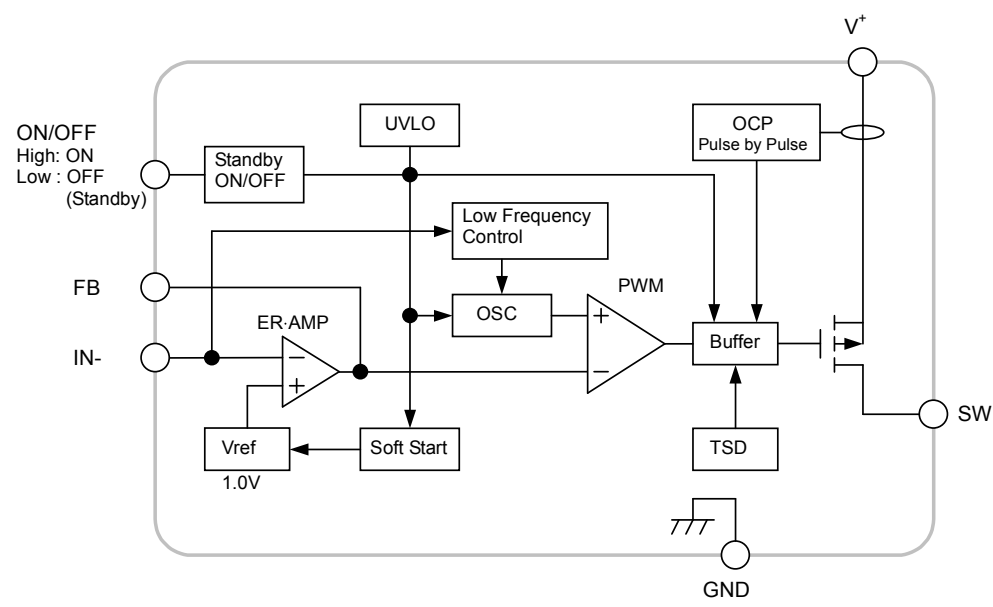
Part Number	Version	Oscillating Frequency	Operating Temperature Range
NJW4150ARB1-A	A	1,000kHz typ.	General Spec. -40°C to +125°C

NJW4150A

PIN CONFIGURATION



BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

PARAMETER	SYMBOL	MAXIMUM RATINGS	UNIT
Supply Voltage	V ⁺	-0.3 to +45	V
V ⁺ - SW pin Voltage	V _{V-SW}	+45	V
IN- pin Voltage	V _{IN-}	-0.3 to +6	V
ON/OFF pin Voltage	V _{ON/OFF}	-0.3 to +45	V
Power Dissipation	P _D	580 (*1) 780 (*2)	mW
Junction Temperature Range	T _j	-40 ~ +150	°C
Operating Temperature Range	T _{opr}	-40 ~ +125	°C
Storage Temperature Range	T _{stg}	-50 ~ +150	°C

(*1): Mounted on glass epoxy board. (76.2×114.3×1.6mm:EIA/JDEC standard size, 2Layers)

(*2): Mounted on glass epoxy board. (76.2×114.3×1.6mm:EIA/JDEC standard size, 4Layers),
internal Cu area: 74.2×74.2mm

■ RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT
Operating Voltage	V ⁺	6.2	—	40	V

NJW4150A

■ ELECTRICAL CHARACTERISTICS ($V^+=V_{ON/OFF}=24V$, $T_a=25^\circ C$)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
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Under Voltage Lockout Block

ON Threshold Voltage	V_{T_ON}	$V^+ = L \rightarrow H$	5.6	5.9	6.2	V
OFF Threshold Voltage	V_{T_OFF}	$V^+ = H \rightarrow L$	5.4	5.7	6.0	V
Hysteresis Voltage	V_{HYS}		150	200	—	mV

Soft Start Block

Soft Start Time	t_{SS}	$V_B=0.95V$	2	4	8	ms
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Oscillator Block

Oscillating Frequency	f_{OSC}	A version $V_{IN}=0.9V$, $V_{FB}=0.5V$	900	1,000	1,100	kHz
Oscillating Frequency OCP operates	f_{OSC_LIM}	$V_{IN}=0V$, $V_{FB}=0.5V$	—	333	—	kHz
Oscillating Frequency deviation (Supply voltage)	f_{DV}	$V^+=6.2V$ to $40V$	—	1	—	%
Oscillating Frequency deviation (Temperature)	f_{DT}	$T_a=-40^\circ C$ to $+85^\circ C$	—	5	—	%

Error Amplifier Block

Reference Voltage	V_B		-1.0%	1.00	+1.0%	V
Input Bias Current	I_B		-0.1	—	0.1	μA

PWM Comparator Block

Maximum Duty Cycle	M_{AXDUTY}	$V_{IN}=0.9V$	100	—	—	%
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Output Block

Output ON Resistance	R_{ON}	$I_{SW}=300mA$	—	1.0	1.45	Ω
Switching Current Limit	I_{LIM}		450	600	750	mA
SW Leak Current	I_{LEAK}	$V_{ON/OFF}=0V$, $V^+=40V$, $V_{SW}=0V$	—	—	1	μA

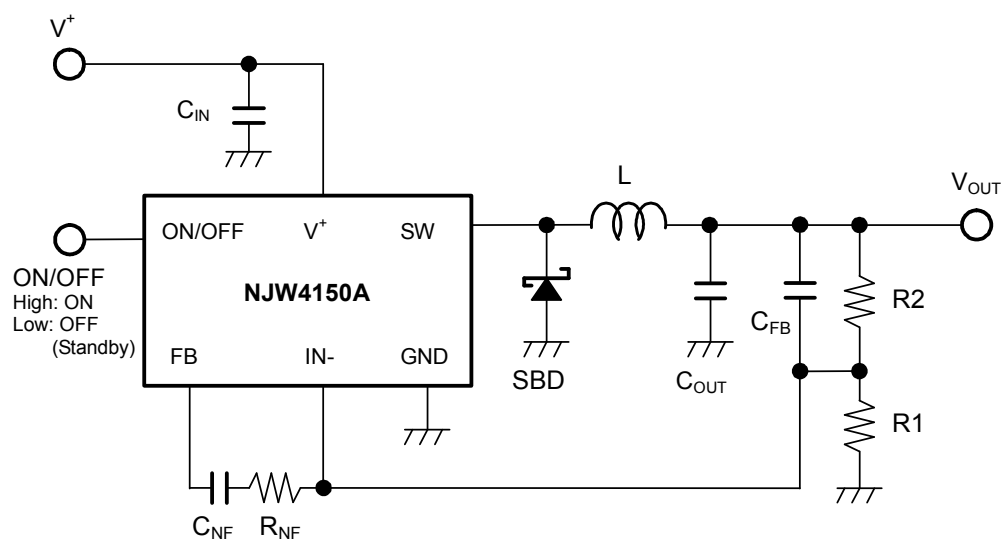
ON/OFF Block

ON Control Voltage	V_{ON}	$V_{ON/OFF} = L \rightarrow H$	1.6	—	V^+	V
OFF Control Voltage	V_{OFF}	$V_{ON/OFF} = H \rightarrow L$	0	—	0.3	V

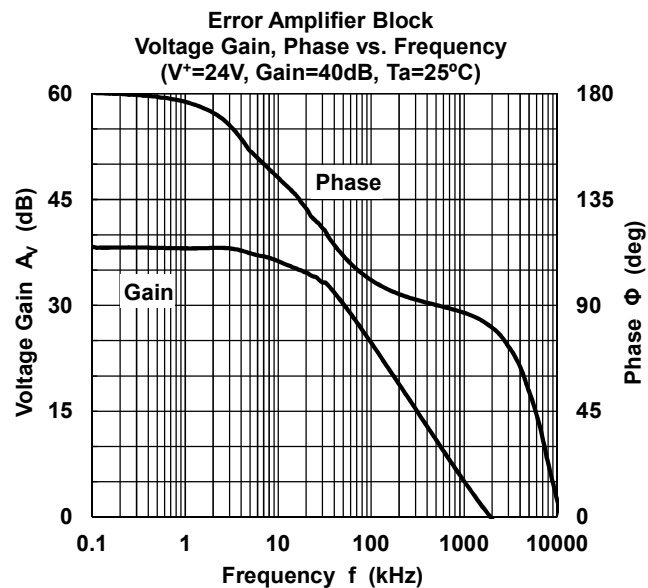
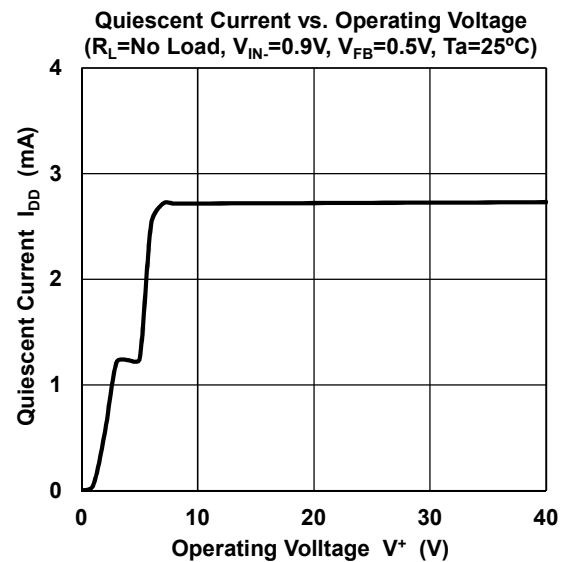
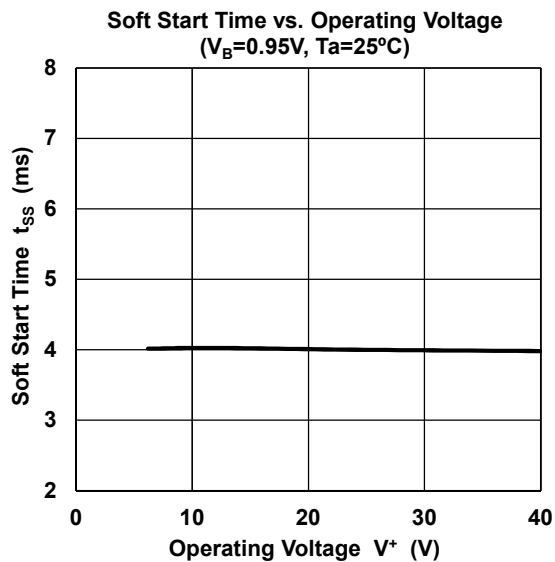
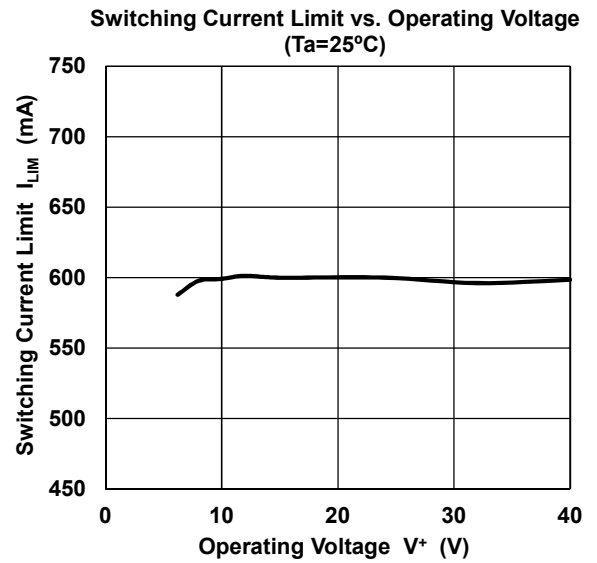
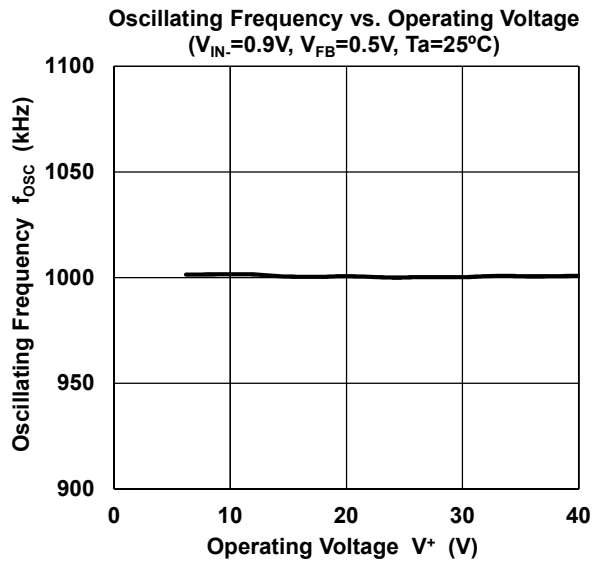
General Characteristic

Quiescent Current	I_{DD}	$R_L=no\ load$, $V_{IN}=0.9V$, $V_{FB}=0.5V$	—	2.75	3.1	mA
Standby Current	I_{DD_STB}	$V_{ON/OFF}=0V$	—	—	1	μA

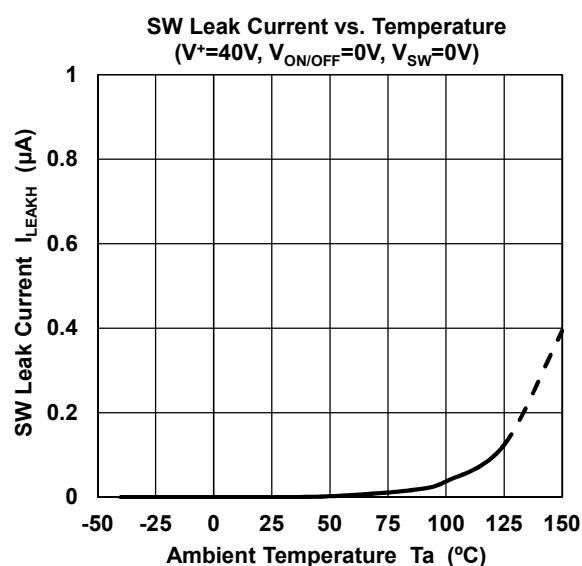
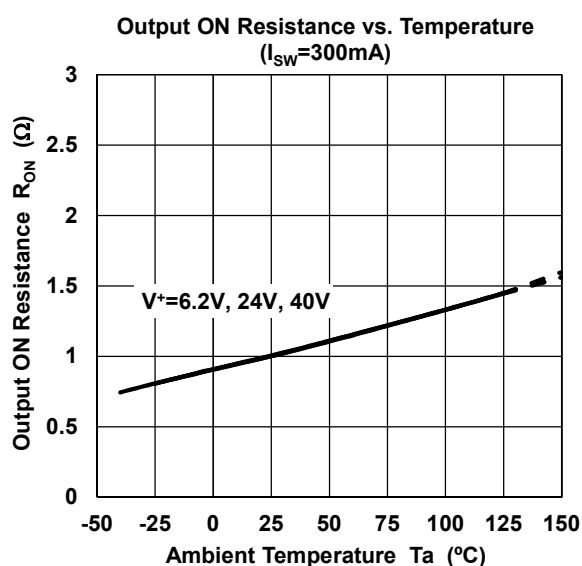
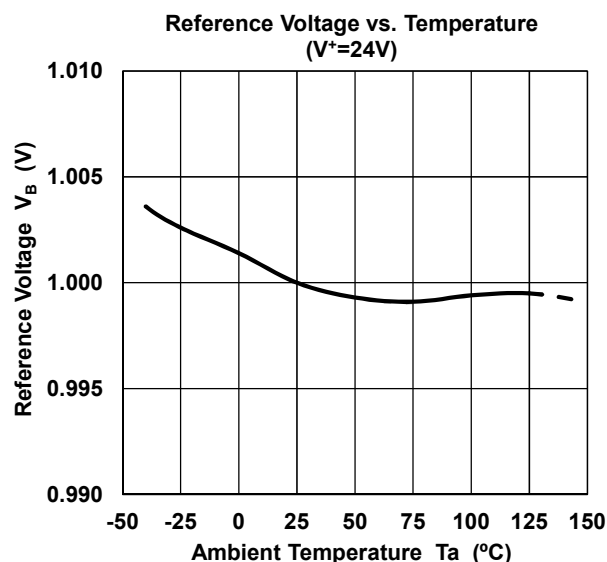
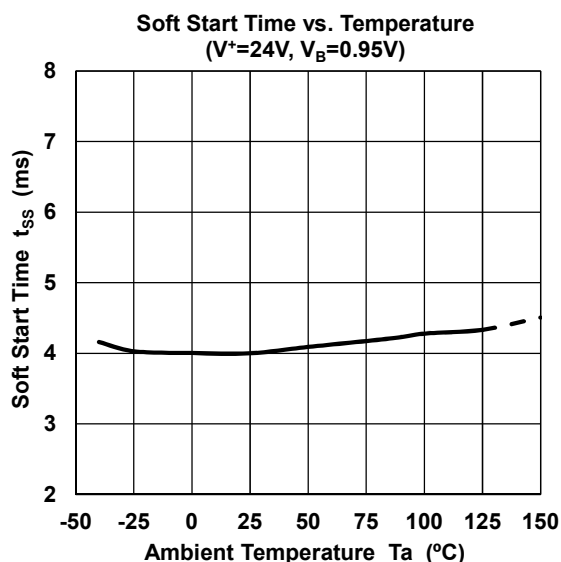
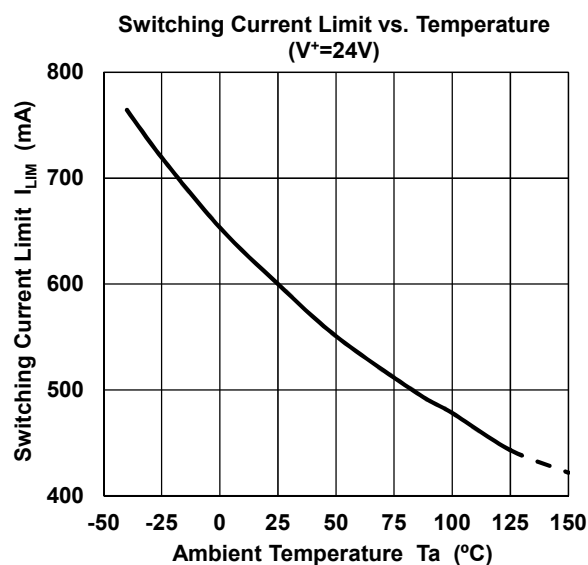
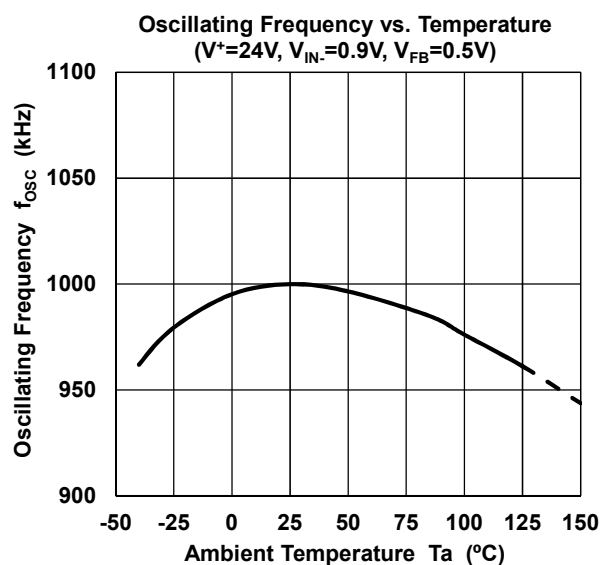
■ TYPICAL APPLICATIONS



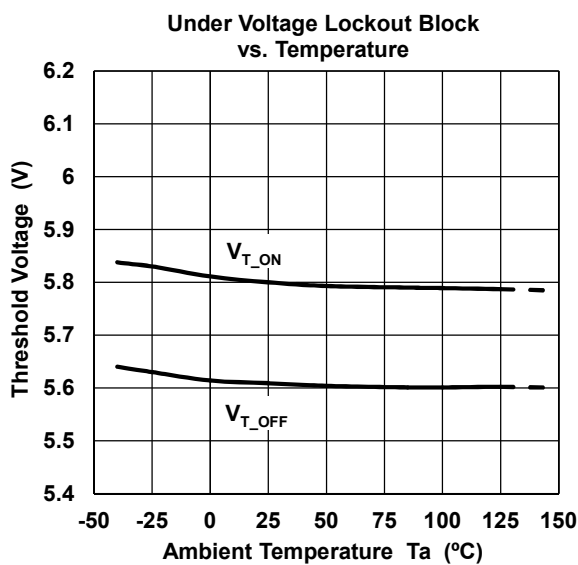
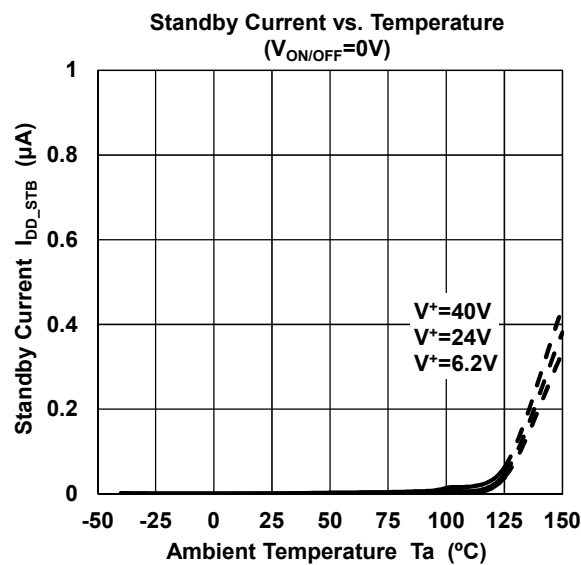
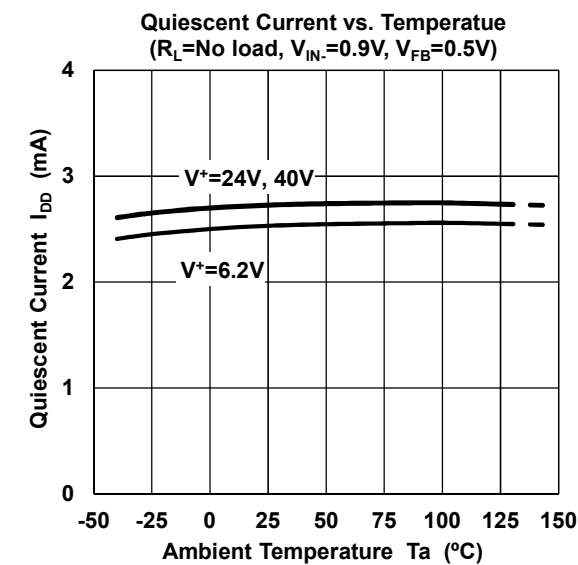
■ TYPICAL CHARACTERISTICS



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■TYPICAL CHARACTERISTICS



MEMO

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