LOW DROPOUT VOLTAGE REGULATOR

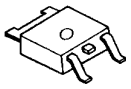
■ GENERAL DESCRIPTION

The NJM2855 is a 3-terminal low dropout voltage regulator. Advanced Bipolar technology achieves low noise, high ripple rejection.

It delivers up to 5V/1A output power with the maximum input voltage of 10V.

The NJM2855 is suitable for various applications such as portable / consumer devices.

■ PACKAGE OUTLINE

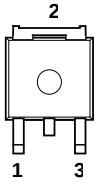


NJM2855DL1

■ FEATURES

- High Ripple Rejection 75dB typ. (f=1kHz,Vo=3V Version)
- Output Noise Voltage Vno=45μVrms typ.
- Output capacitor with 2.2μF ceramic capacitor (Vo≥2.7V)
- Output Current Io(max.)=1A
- High Precision Output Vo±1.0%
- Low Dropout Voltage 0.20V typ. (Io=600mA)
- Internal Short Circuit Current Limit
- Internal Thermal Overload Protection
- Bipolar Technology
- Package Outline TO-252-3

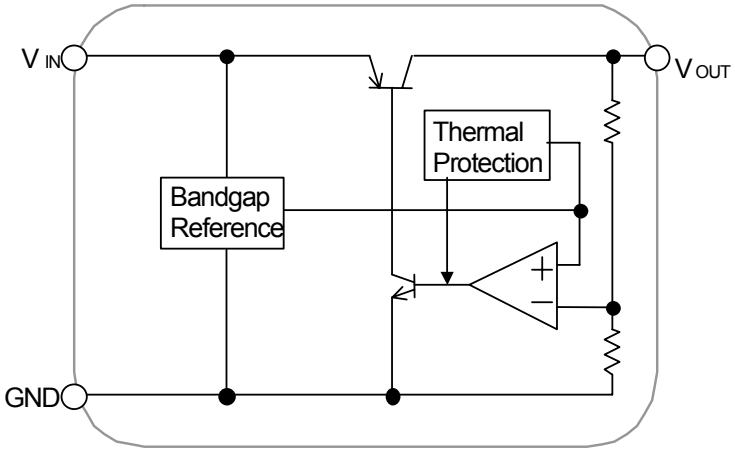
■ PIN CONFIGURATION



PIN FUNCTION
1.V_{IN}
2.GND
3.V_{OUT}

NJM2855DL1

■ EQUIVALENT CIRCUIT



■ OUTPUT VOLTAGE RANK LIST

Device Name	V_{OUT}
NJM2855DL1-15	1.5V
NJM2855DL1-18	1.8V
NJM2855DL1-23	2.3V
NJM2855DL1-25	2.5V
NJM2855DL1-03	3.0V
NJM2855DL1-33	3.3V
NJM2855DL1-05	5.0V

Output voltage options available : 1.5 ~ 5.0V (0.1V step)

■ ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Input Voltage	V_{IN}	+10	V
Power Dissipation	P_D	1190(*1)	mW
Operating Temperature	Topr	-40 ~ +85	°C
Storage Temperature	Tstg	-40 ~ +150	°C

(*1): Mounted on glass epoxy board based on EIA/JEDEC. (114.3x76.2x1.6mm: 2Layers, copper area 100mm^2)

■ OPERATING VOLTAGE

V_{IN}=+2.5V ~ +8V (In case of Vo<2.3V version)

■ ELECTRICAL CHARACTERISTICS

(V_{IN}=Vo+1V, C_{IN}=0.33µF, Co=2.2µF(1.7V<Vo≤2.6V:4.7µF, Vo≤1.7V:10µF), Ta=25°C)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Voltage	Vo	Io=30mA	-1.0%	-	+1.0%	V
Input Voltage	V_{IN}		-	-	8	V
Quiescent Current	I_Q	Io=0mA	-	400	600	µA
Output Current	Io	Vo-0.3V	1000	1300	-	mA
Line Regulation	$\Delta Vo/\Delta V_{IN}$	V_{IN}=Vo+1V~Vo+6V(Vo≤2V), V_{IN}=Vo+1V~8V(Vo>2V), Io=30mA	-	-	0.10	%/V
Load Regulation	$\Delta Vo/\Delta Io$	Io=0 ~ 1A	-	-	0.004	%/mA
Dropout Voltage(*2)	ΔV_{I-O}	Io=600mA	-	0.20	0.28	V
Ripple Rejection	RR	ein=200mVrms,f=1kHz, Io=10mA Vo=3.0V Version	-	75	-	dB
Average Temperature Coefficient of Output Voltage	$\Delta Vo/\Delta Ta$	Ta=0~85°C, Io=10mA	-	±50	-	ppm/°C
Output Noise Voltage	V_{NO}	f=10Hz~80kHz, Io=10mA, Vo=3.0V Version(*3)	-	45	-	µVrms
Input Voltage	V_{IN}		-	-	8	V

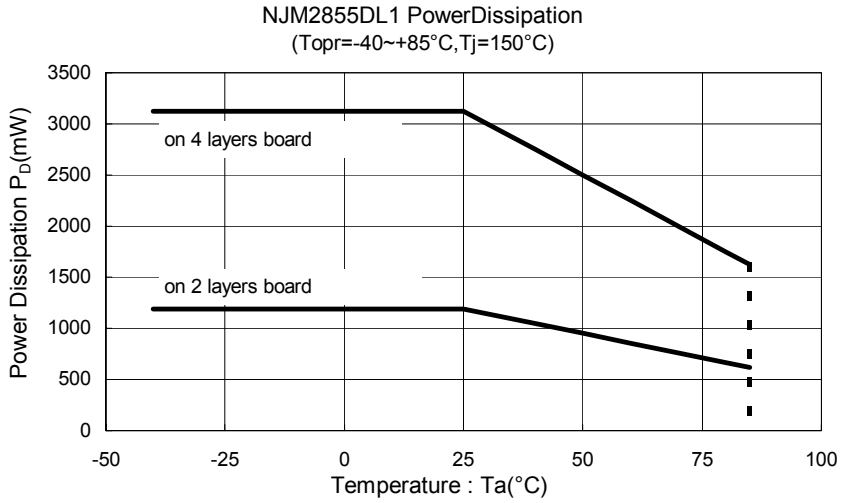
(*2): The output voltage excludes under 2.1V.

(*3): Vo>2.0V : V_{IN}=Vo+1V, Vo≤2.0V : V_{IN}=3.0V

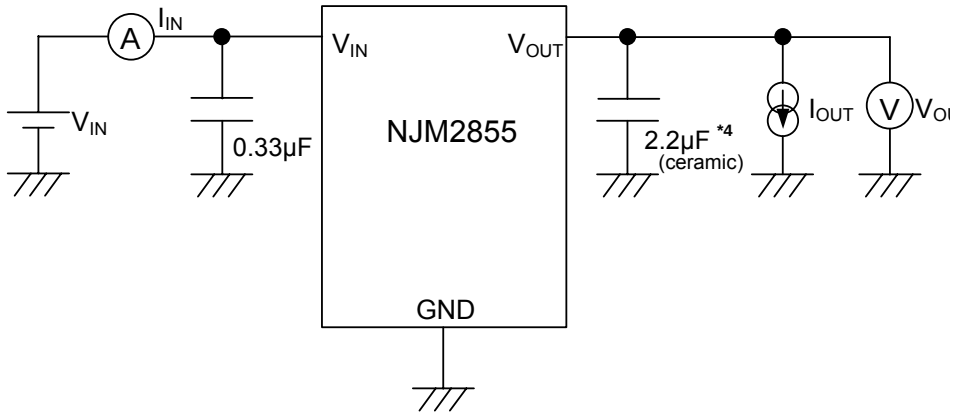
The above specification is a common specification for all output voltages.

Therefore, it may be different from the individual specification for a specific output voltage.

■ POWER DISSIPATION vs. AMBIENT TEMPERATURE

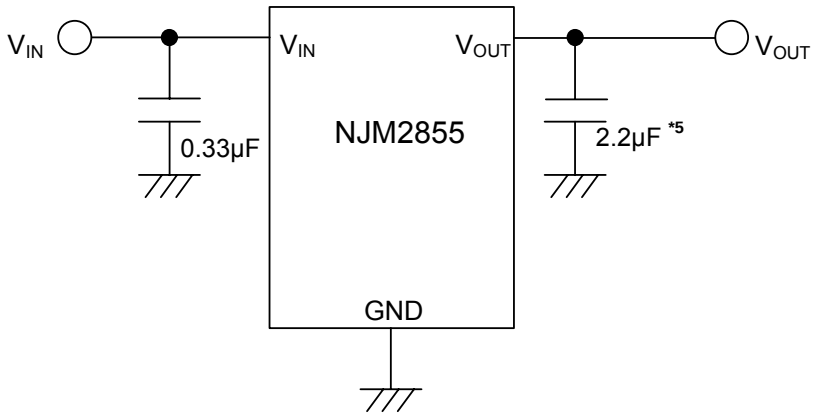


■ TEST CIRCUIT



*4 1.7V<Vo≤2.6V version: Co=4.7µF(ceramic)
Vo≤1.7V version: Co=10µF(ceramic)

■ TYPICAL APPLICATION



*5 1.7V<Vo≤2.6V version: Co=4.7µF
Vo≤1.7V version: Co=10µF

∗Input Capacitance C_{IN}

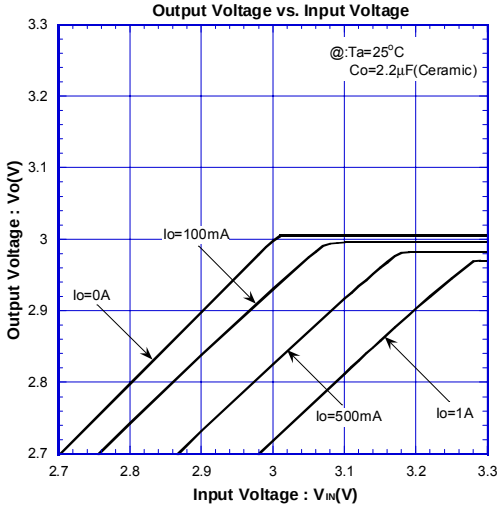
Input Capacitance C_{IN} is required to prevent oscillation and reduce power supply ripple for applications with high power supply impedance or a long power supply line.
Use the C_{IN} value of 0.33μF greater to avoid the problem.
C_{IN} should connect between GND and V_{IN} as short as possible.

∗Output Capacitance Co

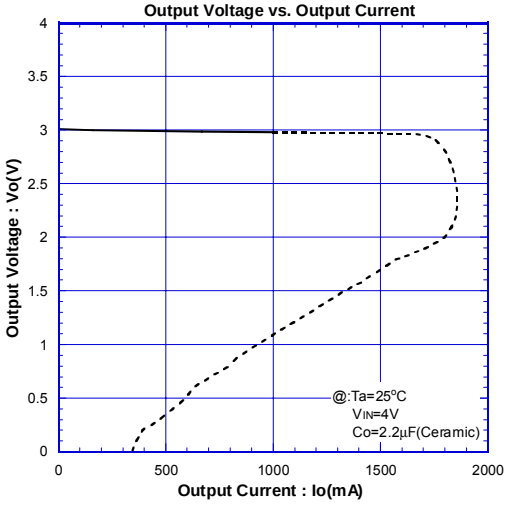
Output capacitor (Co) is required for a phase compensation of the internal error amplifier. The capacitance and the equivalent series resistance (ESR) influence stability of the regulator.
If use a smaller Co, it may cause excess output noise or oscillation of the regulator due to lack of the phase compensation. Therefore, use Co with the recommended capacitance or greater value and connect between Vo terminal and GND terminal with minimal wiring.
The recommended capacitance depends on the output voltage. Low voltage regulator requires greater value of the Co. Thus, check the recommended capacitance for each output voltage.
Use of a greater Co reduces output noise and ripple output, and also improves transient response of the output voltage against rapid load change.
This product is designed to work with any capacitor including a low ESR capacitor for the Co; however, refer "Equivalent Series Resistance vs. Output Current" and choose suitable capacitor.

■ TYPICAL CHARACTERISTICS

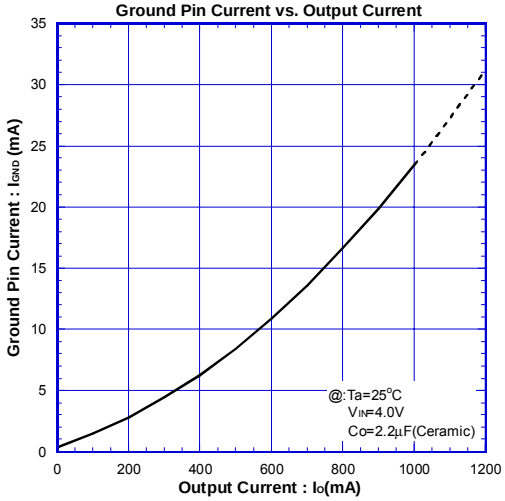
NJM2855_3.0V
Output Voltage vs. Input Voltage



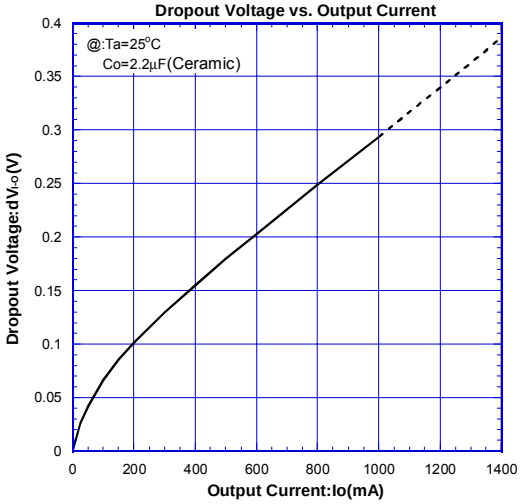
NJM2855_3.0V
Output Voltage vs. Output Current



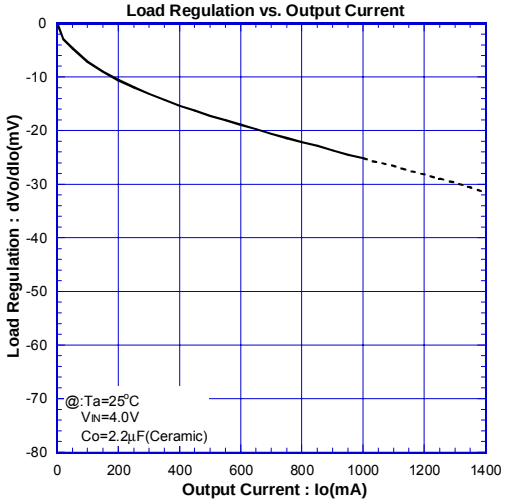
NJM2855_3.0V
Ground Pin Current vs. Output Current



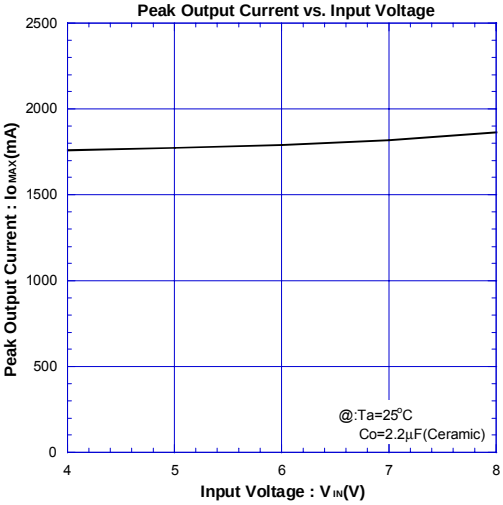
NJM2855_3.0V
Dropout Voltage vs. Output Current



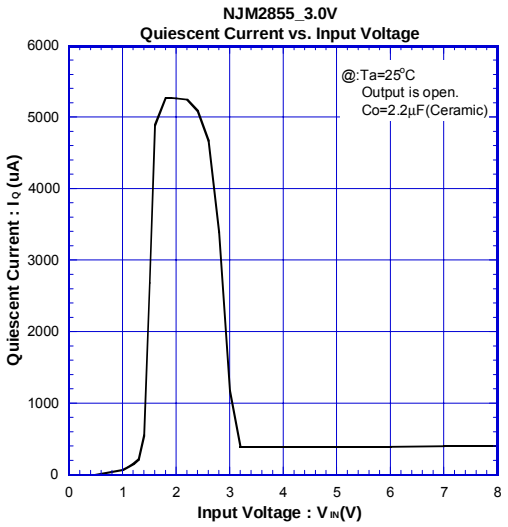
NJM2855_3.0V
Load Regulation vs. Output Current

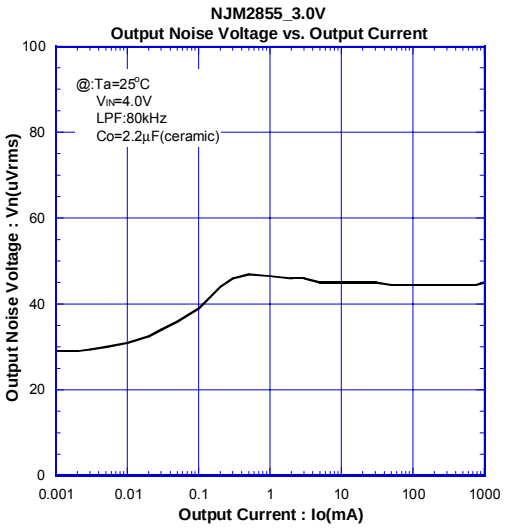


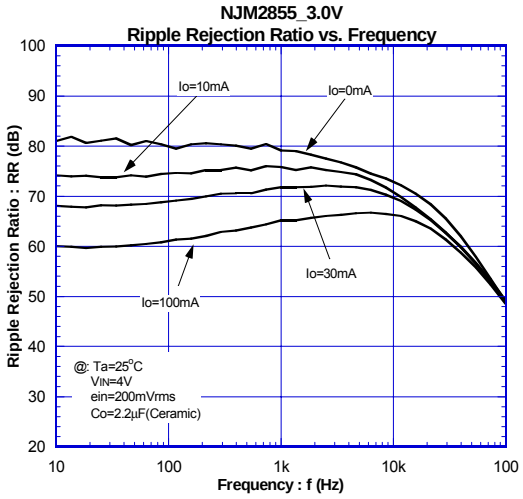
NJM2855_3.0V
Peak Output Current vs. Input Voltage

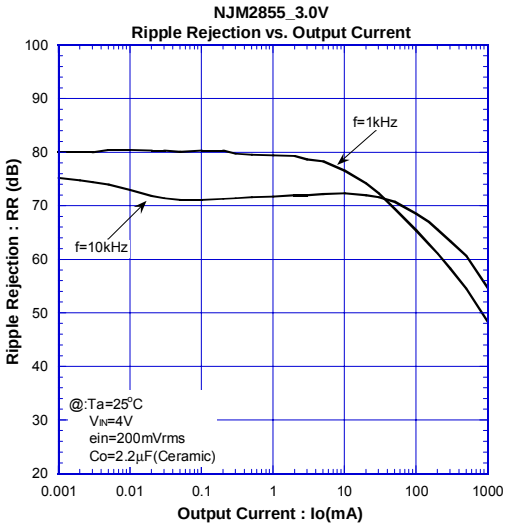


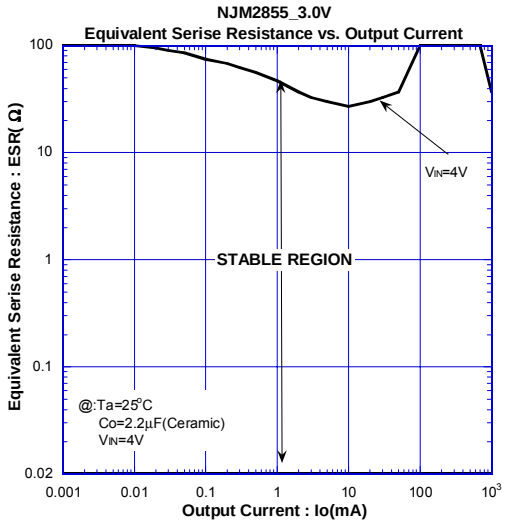
■ TYPICAL CHARACTERISTICS





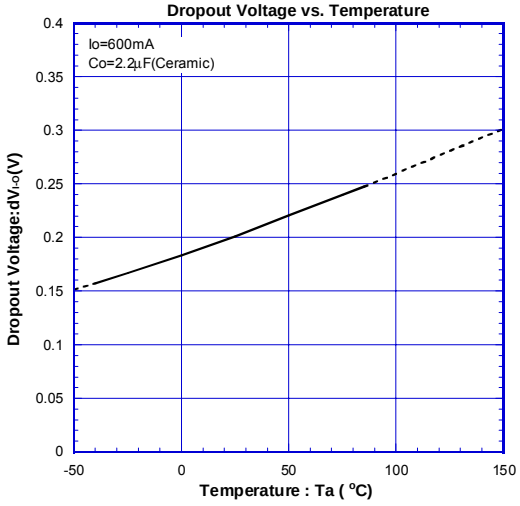




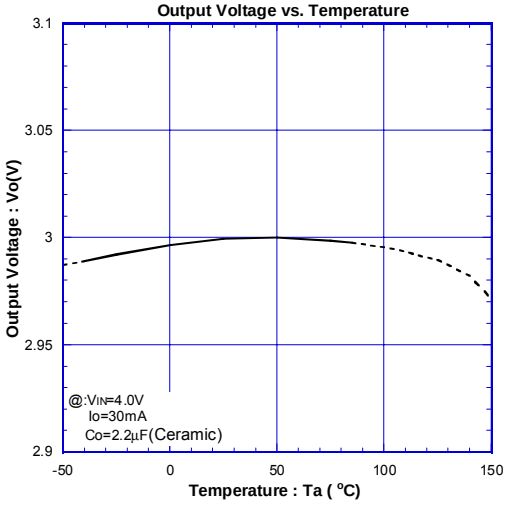


■ TYPICAL CHARACTERISTICS

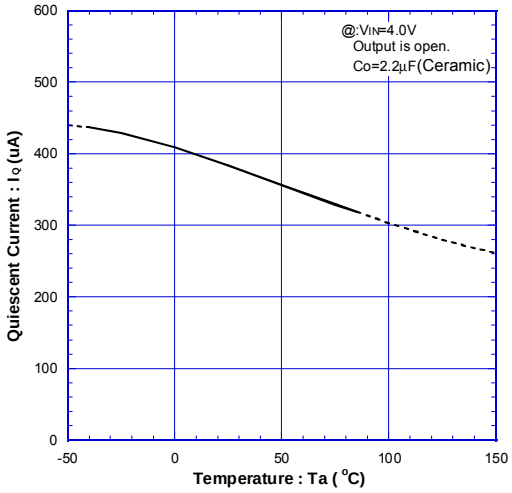
NJM2855_3.0V
Dropout Voltage vs. Temperature



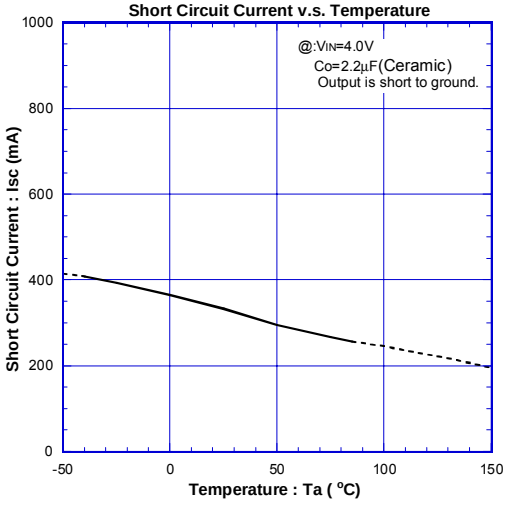
NJM2855_3.0V
Output Voltage vs. Temperature



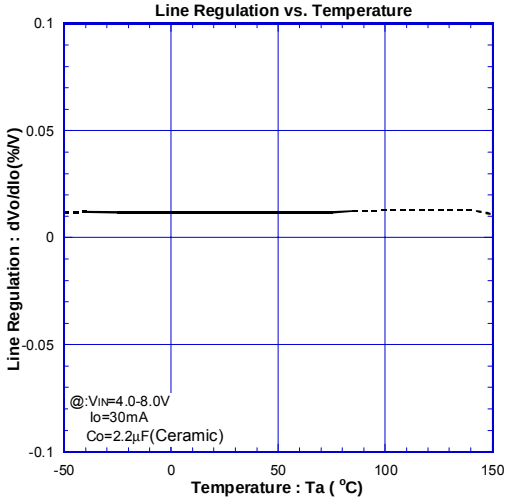
NJM2855_3.0V
Quiescent Current v.s. Input Voltage



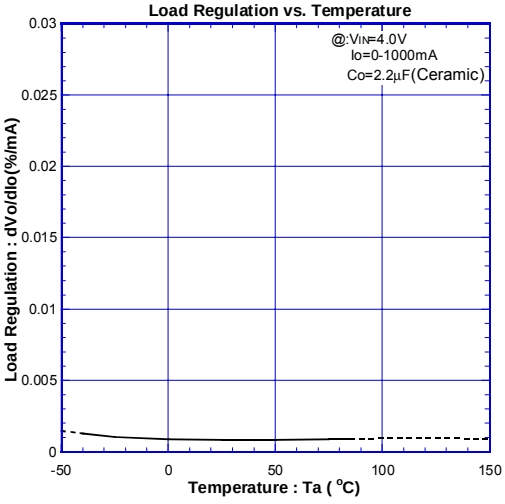
NJM2855_3.0V
Short Circuit Current v.s. Temperature



NJM2855_3.0V
Line Regulation vs. Temperature



NJM2855_3.0V
Load Regulation vs. Temperature



■ TYPICAL CHARACTERISTICS