DESCRIPTION

The A6150-Q provides wide range input from 2.6 V to 6V input voltage and up to 150mA CMOS LDO. The ultra-low drop voltage, low quiescent current and low noise make it suitable for low power applications and in battery-powered systems. Regulator ground current increases slightly in dropout only, prolonging the battery life.

The A6150-Q is designed to work with low ESR ceramic capacitors.

The A6150-Q is available in SOT-25 Package.

ORDERING INFORMATION

Package Type	Part Number	
SOT-25 SPQ: 3,000pcs/Reel	E5	A6150E5R-xxQ
		A6150E5VR-xxQ
Note	xx: Output Voltage 18=1.8V 30=3.0V 33=3.3V Q: AEC-Q V: Halogen free Package R: Tape & Reel	
AiT provides all RoHS products		

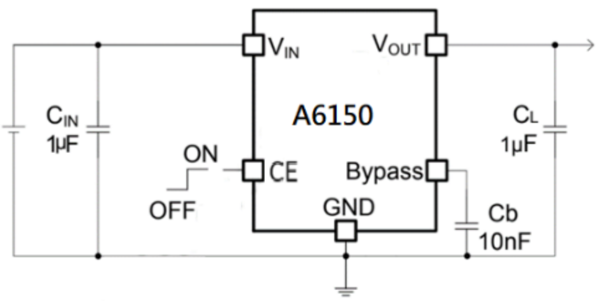
FEATURES

- Input Voltage from 2.6 V To 6 V
- Stable with Low ESR Ceramic Capacitors
- Ultra-Low-Dropout Voltage
  60 mV @ 150 mA
  0.4 mV @1 mA
- Very Low Quiescent Current
  85uA @No Load
  170uA @ 150 mA
- Output Current Up To 150 mA
- Fast Turn-On Time: 200us
- Logic-Controlled Electronic Shutdown
- Internal Current and Thermal Limit
- AEC-Q100 Qualified
  Temperature Range: -40°C ~+ 125 °C

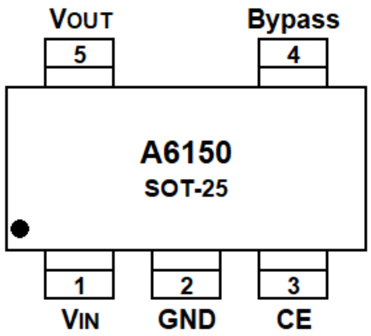
APPLICATION

- Mobile Phones
- Similar Battery-Powered Wireless Systems
- Automotive ECU Controller

TYPICAL APPLICATION



PIN DESCRIPTION



SOT-25, E5

Top View

Pin #	Symbol	Function
1	V_{IN}	Input Voltage of the LDO
2	GND	Common Ground
3	CE	Input Voltage: ON Mode when $V_{CE} \geq 1.2$ V; OFF Mode when $V_{CE} \leq 0.4$ V (Must have an external pulled Down/Up resistor without floating)
4	Bypass	Bypass Pin: An External Capacitor (Usually 10nF) Has to Be Connected to Minimize Noise Voltage
5	V_{OUT}	Output Voltage of the LDO

ABSOLUTE MAXIMUM RATINGS

V_{IN}, DC Input Voltage		-0.3V ~ 6V
V_O, DC Output Voltage		-0.3V ~ V_I +0.3V
V_{CE}, CE Input Voltage		-0.3V ~ V_I +0.3V
I_O, Output Current		Internally Limited
Pd, Internal Power Dissipation (SOT-25)		600mW
θ_{JA}, Thermal resistance (Junction to air) (SOT-25)		210°C/W
T_A, Operating Ambient Temperature Range		-40°C~+125°C
T_{stg}, Storage Temperature Range		-55°C~+150°C
T_J, Junction Temperature		-40°C~+150°C
ESD, Human-Body Model (HBM)		±4000V
ESD, Charged-Device Model (CDM)	Corner Pins	±750V
	All Pins	±500V

Stress beyond above listed "Absolute Maximum Ratings" may lead permanent damage to the device. These are stress ratings only and operations of the device at these or any other conditions beyond those indicated in the operational sections of the specifications are not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

ELECTRICAL CHARACTERISTICS

T_A= 25°C, V_I = $V_{O(NOM)}$ +0.5V, C_I = 1μF, C_{BYP} = 10nF, I_O =1mA, V_{CE} = 1.4V, unless otherwise noted.

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Operating Input Voltage	V_I		2.60	-	6	V
Output Voltage Accuracy, $V_{O(NOM)}$ < 2.6V	V_O	I_O = 1mA	-50	-	50	mV
		T_A = -40°C~+125°C	-75	-	75	
Output Voltage Accuracy, $V_{O(NOM)}$ ≥ 2.6V	V_O	I_O = 1mA	-2	-	2	% Of VO(NOM)
		T_A = -40°C~+125°C	-3	-	3	
Line Regulation (1)	ΔV_O	V_I = $V_{O(NOM)}$ + 0.5V ~ 6 V T_A = -40 ~+ 125 °C	-0.10	-	0.10	%/V
		$V_{O(NOM)}$ = 4.7V ~5V	-0.19	-	0.19	
Load Regulation	ΔV_O	I_O = 1 mA ~ 150 mA, $V_{O(NOM)}$ < 2.6 V, T_A = -40~+125 °C	-	0.002	0.008	%/mA
Load Regulation	ΔV_O	I_O = 1 mA ~ 150 mA, $V_{O(NOM)}$ ≥ 2.6V	-	0.0004	0.002	%/mA
		I_O = 1 mA ~ 150 mA, $V_{O(NOM)}$ ≥ 2.6V, T_A = -40~+125 °C	-	0.0025	0.005	
Output AC Line Regulation (2)	ΔV_O	V_I = $V_{O(NOM)}$ + 1 V, I_O = 150 mA, t_R= t_F = 30 μs	-	1.50	-	mV PP
Quiescent Current ON Mode: V_{CE}=1.2V	I_Q	I_O = 0	-	85	-	μA
		I_O = 0, T_A = -40~+125 °C	-	-	150	
		I_O = 0 ~150mA	-	170	-	
		I_O = 0 ~150mA, T_A = -40~+125 °C	-	-	250	
OFF Mode: V_{CE}=0.4V			-	0.003	-	
		T_A = -40~+125 °C	-	-	1.50	
Dropout Voltage	V_{DROP}	I_O = 1mA	-	0.40	-	mV
		I_O = 1mA, T_A = -40~+125 °C	-	-	2	
		I_O = 50mA	-	20	-	
		I_O = 50mA, T_A = -40~+125 °C	-	-	35	
		I_O = 100mA	-	45	-	
		I_O = 100mA, T_A = -40~+125 °C	-	-	70	
		I_O = 150mA	-	60	-	
		I_O = 150mA, T_A = -40~+125 °C	-	-	100	
Short-Circuit Current	I_{SC}	R_L =0	-	450	-	mA
Supply Voltage Rejection	PSRR	V_I = $V_{O(NOM)}$+0.25V ± V_{RIPPLE} = 0.1V, I_O= 50 mA, V_I = 2.65V $V_{O(NOM)}$ <2.6V; F=1Khz	-	60	-	dB
		F=10Khz	-	50	-	
Peak Output Current	$I_{O(PK)}$	V_O ≥ $V_{O(NOM)}$ - 5%	300	450	-	mA
CE Input Logic Low	V_{CE}	V_I = 2.6 V to 6 V, T_A = -40~+125 °C	-	-	0.40	V
CE Input Logic High			1.20	-	-	
CE Input Current	I_{CE}	V_{CE} = 0.4 V, V_I = 6 V	-	±1	-	nA
Output Noise Voltage	eN	B_W = 10Hz ~100kHz, C_O = 1μF	-	30	-	μV$_{RMS}$
Turn-On Time (4)	t_{ON}	C_{BYP} = 10nF	-	100	250	μs
Thermal Shutdown (5)	T_{SDHN}		-	160	-	°C
Output Capacitor	C_O	Capacitance (6)	1	-	22	μF
		ESR	5	-	5000	mΩ

1.For VO(NOM) < 2 V, VI = 2.6 V
2. For VO(NOM) = 1.25 V, VI = 2.6 V
3. Dropout voltage is the input-to-output voltage difference at which the output voltage is 100 mV below its nominal value.
This specification does not apply to input voltages below 2.6 V
4. Turn-on time is time measured between the enable input just exceeding V_{CE} high value and the output voltage just reaching 95% of its nominal value
5. Typical thermal protection hysteresis is 30 °C
6. The minimum capacitor value is 1 μF, anyway the MEQ6310 is still stable if the compensation capacitor has a 30% tolerance in all temperature range. 30% tolerance in all temperature range.

TYPICAL PERFORMANCE CHARACTERISTICS

T_A= 25°C, V_I = $V_{O(NOM)}$ +0.5V, C_I = 1μF, C_{BYP} = 10nF, I_O =1mA, V_{CE} = 1.4V, unless otherwise noted.

Fig 1. V_O=1.8V Output Voltage vs. Temperature

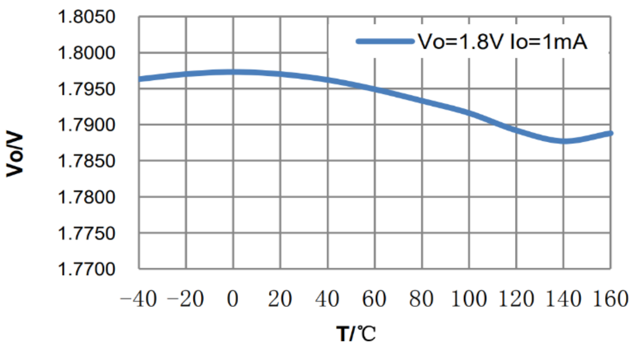


Fig 2. V_O=3V Output Voltage vs. Temperature

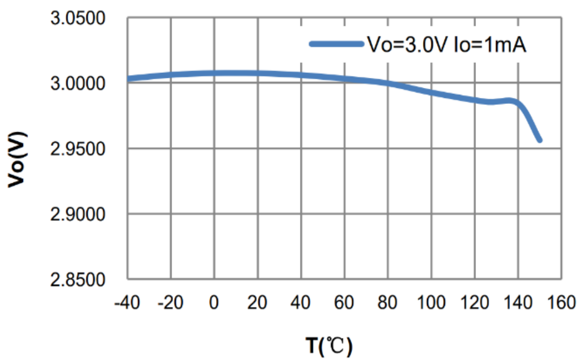


Fig 3. V_O=3.3V Output Voltage vs. Temperature

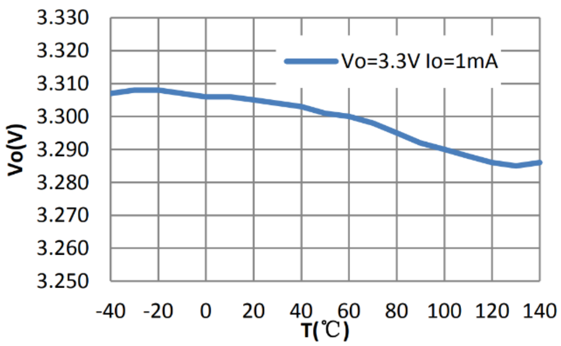


Fig 4. V_O=1.8V Line Regulation vs. Temperature

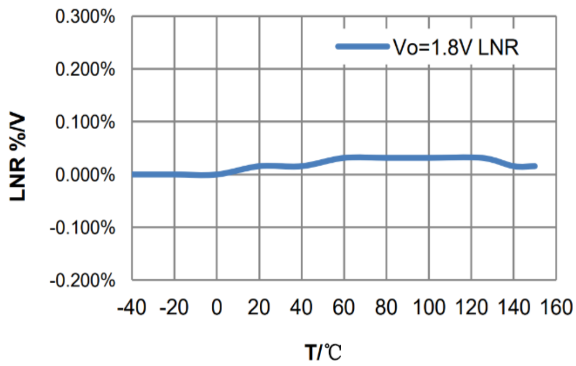


Fig 5. VO=3V Line Regulation vs. Temperature

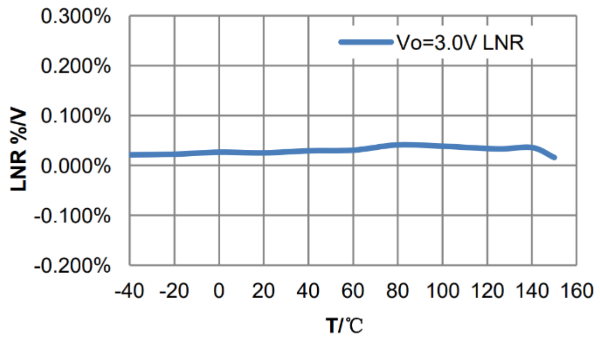


Fig 6. VO=3.3V Line Regulation vs. Temperature

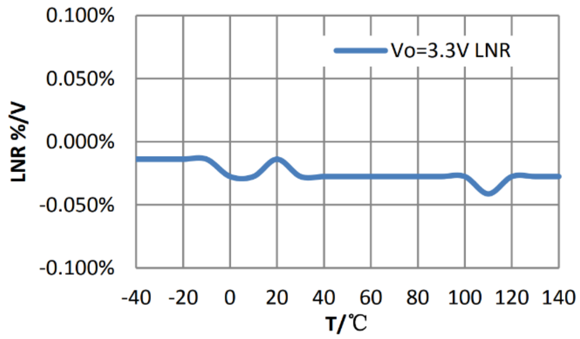


Fig 7. V_O=3V Shutdown Voltage vs. Temperature

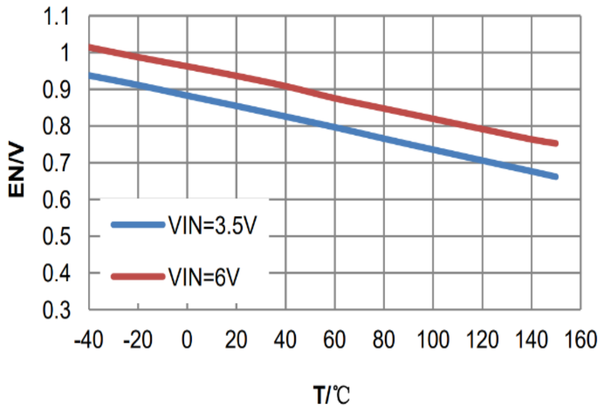


Fig 8. V_O=1.8V Load Regulation vs. Temperature

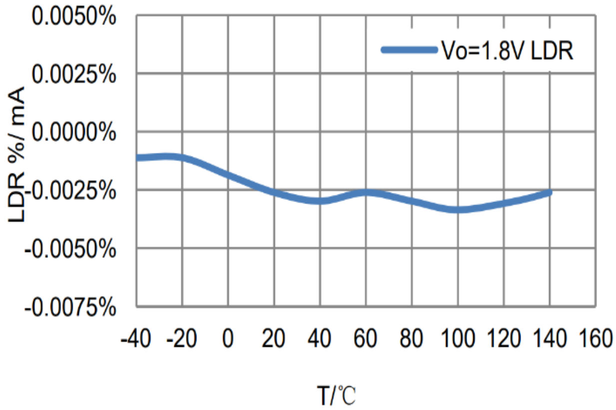


Fig 9. V_O=3V Load Regulation vs. Temperature

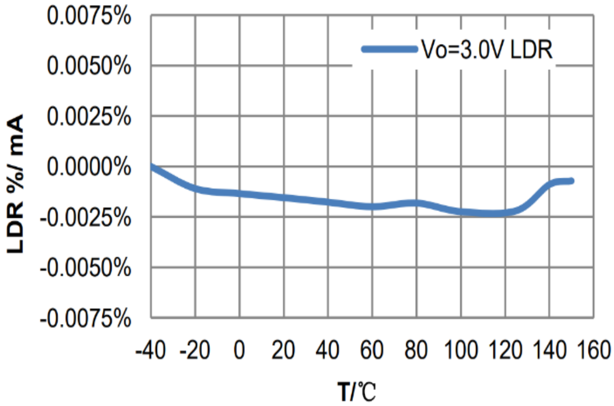


Fig 10. V_O=3.3V Load Regulation vs. Temperature

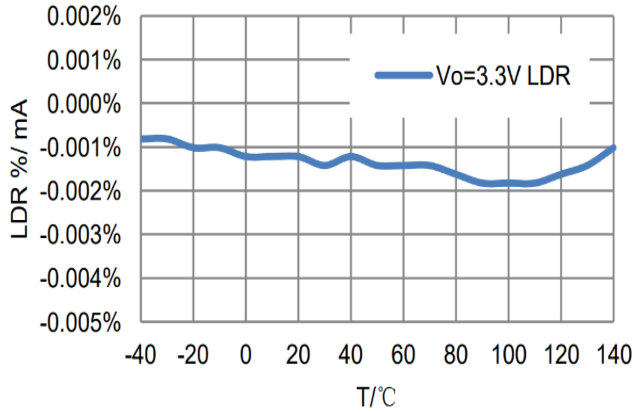


Fig 11. V_O =1.8V V_{IN}=2.5V Quiescent current vs. temperature

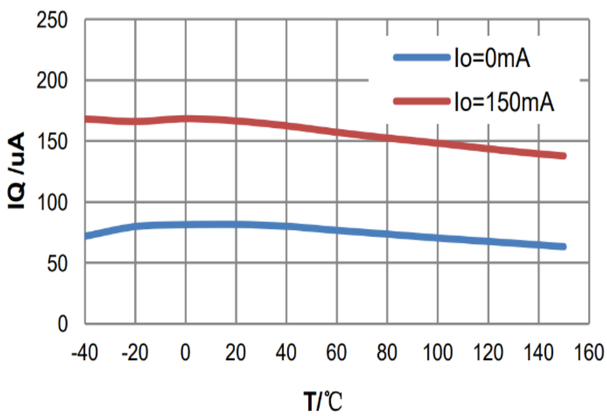


Fig 12. V_O =1.8V V_{IN}=6V Quiescent current vs. temperature

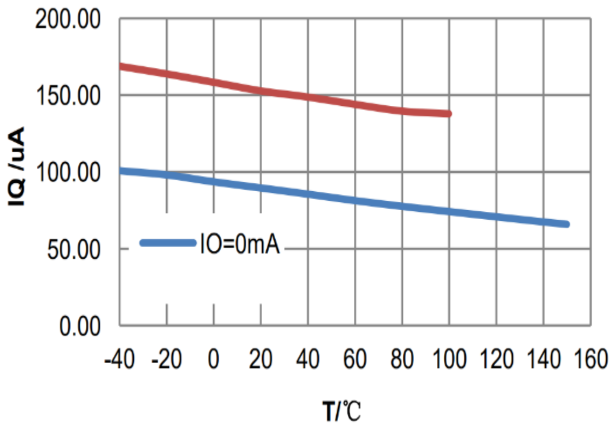


Fig 13. V_{OUT} =1.8V, V_O vs. I_O

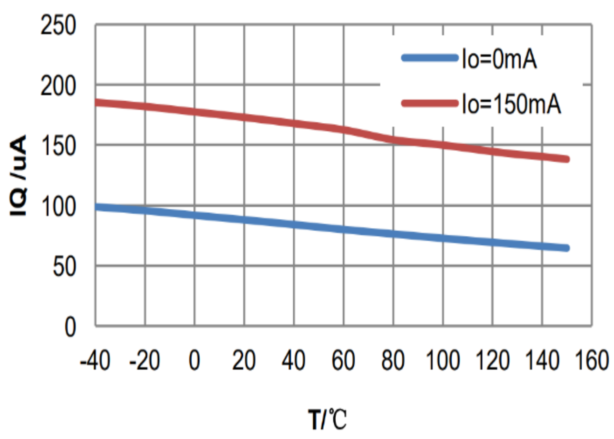


Fig 14. V_{OUT} =3V, V_O vs. I_O

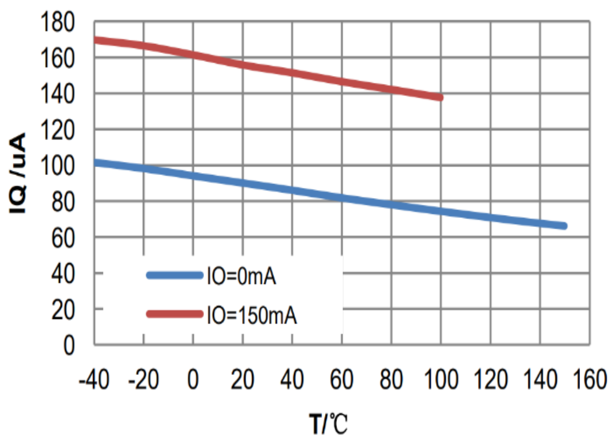


Fig 15. V_{OUT} =1.8V, V_O vs. I_O

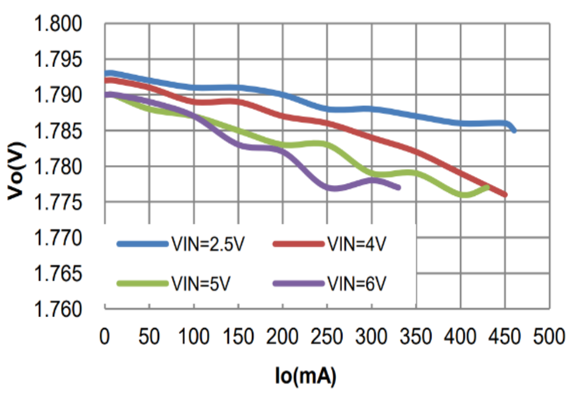


Fig 16. V_{OUT} =3V, V_O vs. I_O

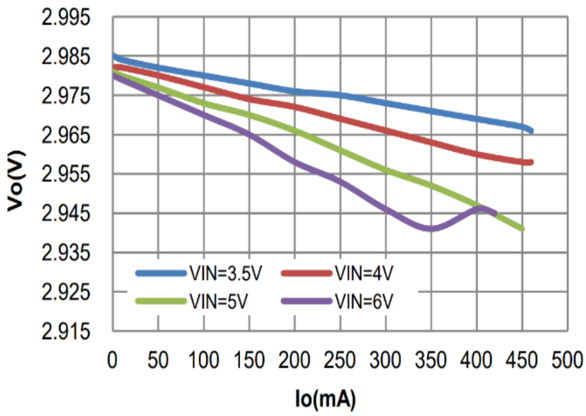


Fig 17. V_{OUT} =1.8V, V_O vs. V_I

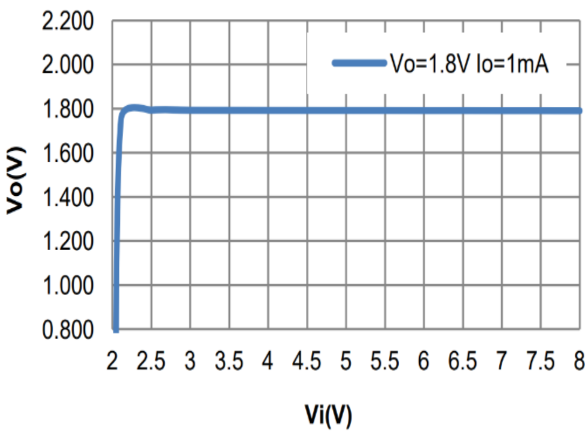
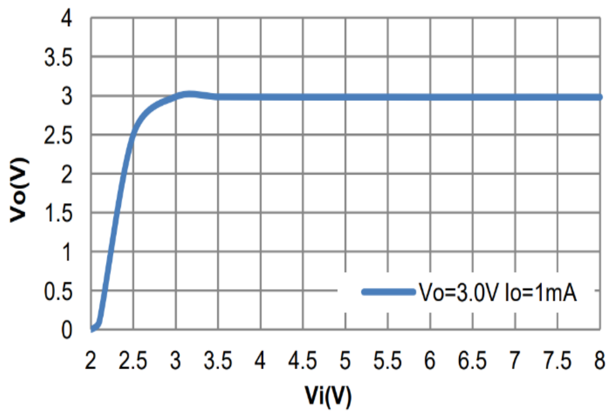
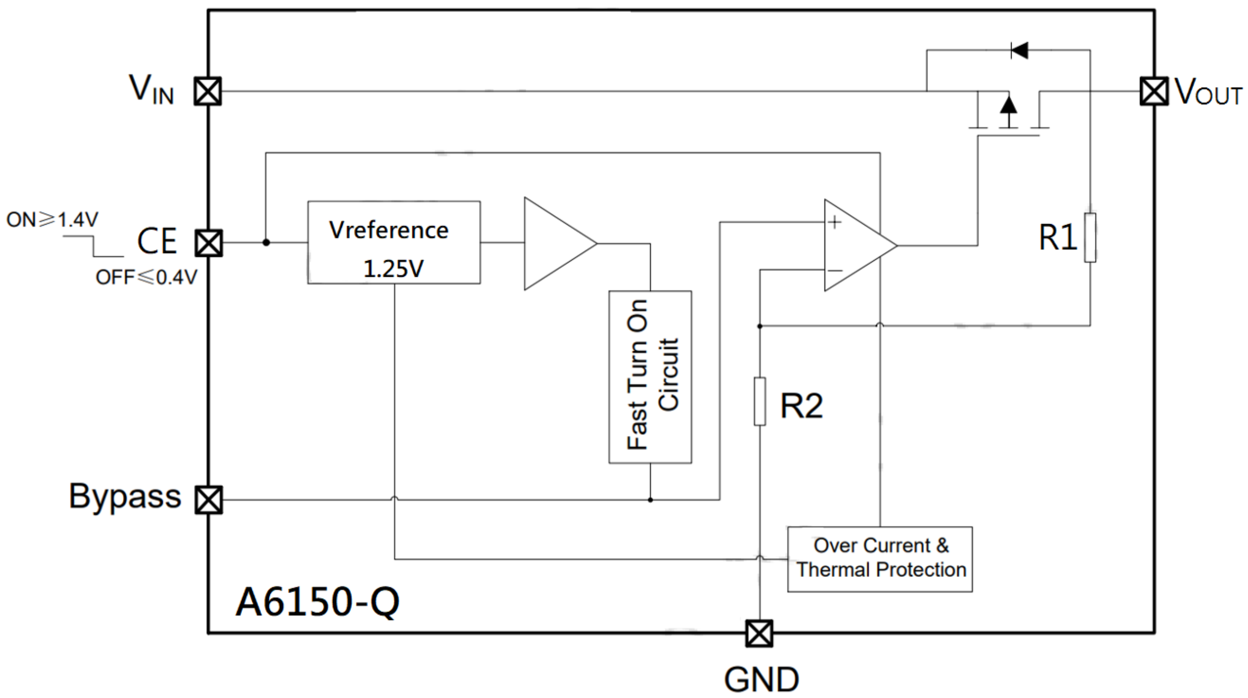


Fig 18. V_{OUT} =3V, V_O vs. V_I

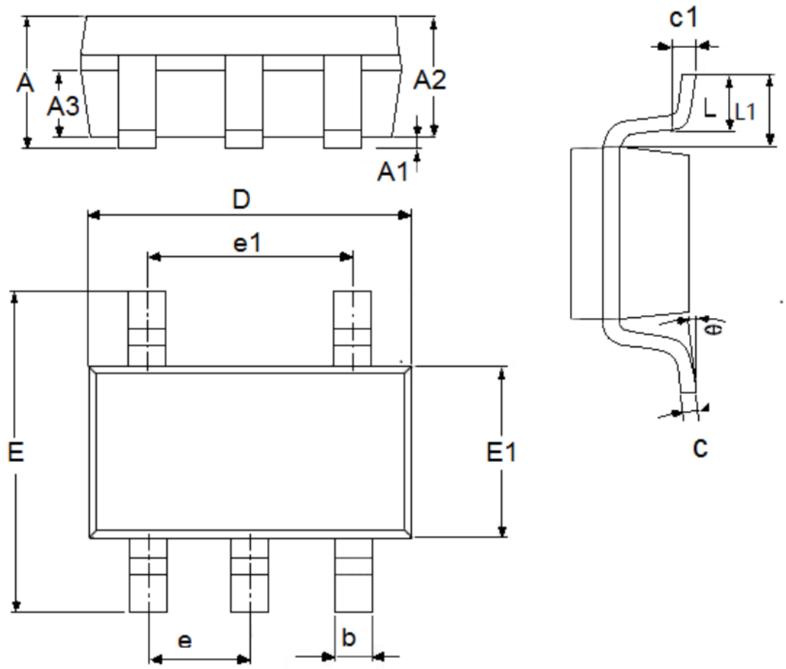


BLOCK DIAGRAM



PACKAGE INFORMATION

Dimension in SOT-25 (Unit: mm)



Symbol	Min.	Max.
A	1.050	1.450
A1	0.000	0.150
A2	0.900	1.300
A3	0.600	0.700
b	0.250	0.500
c	0.100	0.230
c1	0.200 TYP.	
D	2.820	3.050
E	2.600	3.050
E1	1.500	1.750
e	0.950 TYP.	
e1	1.900 TYP.	
L	0.300	0.600
L1	0.590 TYP.	
θ	0°	8°

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