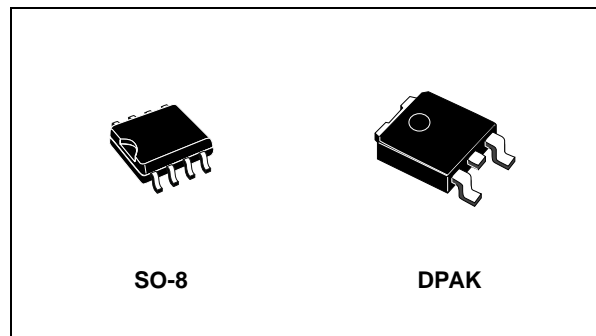




KF00 SERIES

VERY LOW DROP VOLTAGE REGULATORS WITH INHIBIT

- VERY LOW DROPOUT VOLTAGE (0.4V)
- VERY LOW QUIESCENT CURRENT (TYP. 50 μ A IN OFF MODE, 500 μ A IN ON MODE)
- OUTPUT CURRENT UP TO 500 mA
- LOGIC-CONTROLLED ELECTRONIC SHUTDOWN
- OUTPUT VOLTAGES OF 1.25; 1.5; 2.5; 2.7; 3; 3.3; 3.5; 4; 4.5; 4.7; 5; 5.2; 5.5; 6; 8; 8.5; 12V
- INTERNAL CURRENT AND THERMAL LIMIT
- ONLY 2.2 μ F FOR STABILITY
- AVAILABLE IN \pm 2% ACCURACY AT 25 $^{\circ}$ C
- SUPPLY VOLTAGE REJECTION: 70 db (TYP.)
- TEMPERATURE RANGE: -40 TO 125 $^{\circ}$ C



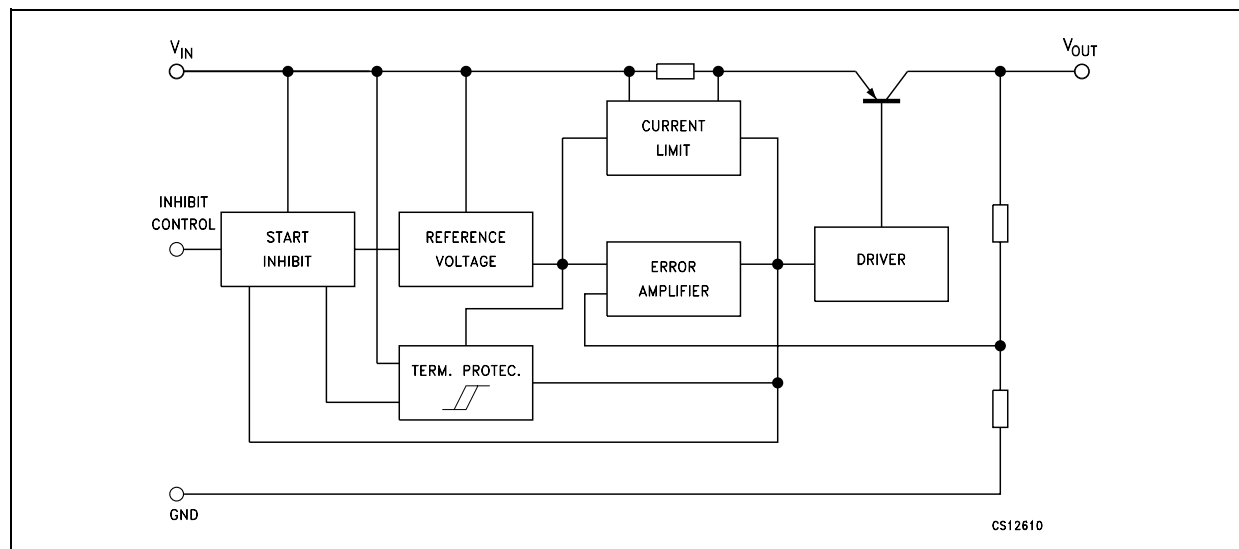
suitable for Low Noise, Low Power applications and specially in battery powered systems. A Shutdown Logic Control function is available (pin 5, TTL compatible). This means that when the device is used as a local regulator, it is possible to put a part of the board in standby, decreasing the total power consumption. It requires only a 2.2 μ F capacitor for stability allowing space and cost saving.

DESCRIPTION

The KF00 series are very Low Drop regulators available in SO-8 package and in a wide range of output voltages.

The very Low Drop voltage (0.4V) and the very low quiescent current make them particularly

SCHEMATIC DIAGRAM



KF00

ABSOLUTE MAXIMUM RATINGS

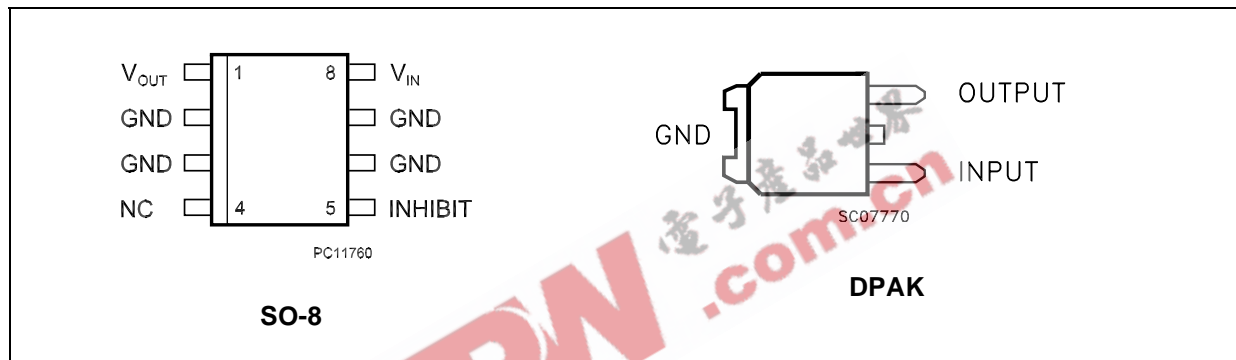
Symbol	Parameter	Value	Unit
V_I	DC Input Voltage	-0.5 to 20	V
I_O	Output Current	Internally Limited	
P_{tot}	Power Dissipation	Internally Limited	
T_{stg}	Storage Temperature Range	-40 to 150	°C
T_{op}	Operating Junction Temperature Range	-40 to 125	°C

Absolute Maximum Ratings are those values beyond which damage to the device may occur. Functional operation under these condition is not implied.

THERMAL DATA

Symbol	Parameter	DAK	SO-8	Unit
$R_{thj-case}$	Thermal Resistance Junction-case	8	20	°C/W

CONNECTION DIAGRAM (top view)



ORDERING CODES

TYPE	SO-8(#)	DAK(#)	OUTPUT VOLTAGE
KF12(*)	KF12BD	KF12BDT	1.25 V
KF15	KF15BD	KF15BDT	1.5 V
KF25	KF25BD	KF25BDT	2.5 V
KF27	KF27BD	KF27BDT	2.7 V
KF30	KF30BD	KF30BDT	3 V
KF33	KF33BD	KF33BDT	3.3 V
KF35	KF35BD	KF35BDT	3.5 V
KF40	KF40BD	KF40BDT	4 V
KF45(*)	KF45BD	KF45BDT	4.5 V
KF47	KF47BD	KF47BDT	4.75 V
KF50	KF50BD	KF50BDT	5 V
KF52	KF52BD	KF52BDT	5.2 V
KF55(*)	KF55BD	KF55BDT	5.5 V
KF60	KF60BD	KF60BDT	6 V
KF80	KF80BD	KF80BDT	8 V
KF85	KF85BD	KF85BDT	8.5 V
KF120	KF120BD	KF120BDT	12 V

(*) Available on request.

(#) Available in Tape & Reel with the suffix "-TR".

TEST CIRCUITS



ELECTRICAL CHARACTERISTICS FOR KF12 (refer to the test circuits, $T_j = 25^\circ\text{C}$, $C_I = 0.1 \mu\text{F}$, $C_O = 2.2 \mu\text{F}$ unless otherwise specified.)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit	
V_O	Output Voltage	$I_O = 50 \text{ mA}$, $V_I = 3.3 \text{ V}$	1.225	1.25	1.275	V	
		$I_O = 50 \text{ mA}$, $V_I = 3.3 \text{ V}$, $T_a = -25 \text{ to } 85^\circ\text{C}$	1.2		1.3		
V_I	Operating Input Voltage	$I_O = 500 \text{ mA}$	2.5		20	V	
I_O	Output Current Limit			1		A	
ΔV_O	Line Regulation	$V_I = 2.5 \text{ to } 20 \text{ V}$, $I_O = 5 \text{ mA}$		2	12	mV	
ΔV_O	Load Regulation	$V_I = 2.8 \text{ V}$, $I_O = 5 \text{ to } 500 \text{ mA}$		2	50	mV	
I_d	Quiescent Current	$V_I = 2.5 \text{ to } 20 \text{ V}$, $I_O = 0 \text{ mA}$	(ON MODE)		0.5	1	mA
		$V_I = 2.6 \text{ to } 20 \text{ V}$, $I_O = 500 \text{ mA}$				12	
		$V_I = 6 \text{ V}$	(OFF MODE)		50	100	μA
SVR	Supply Voltage Rejection	$I_O = 5 \text{ mA}$ $V_I = 3.5 \pm 1 \text{ V}$	$f = 120 \text{ Hz}$	82		dB	
			$f = 1 \text{ KHz}$	77			
			$f = 10 \text{ KHz}$	60			
eN	Output Noise Voltage	$B = 10 \text{ Hz to } 100 \text{ KHz}$		50		μV	
V_d	Dropout Voltage	$I_O = 200 \text{ mA}$		1.25		V	
V_{IL}	Control Input Logic Low	$T_a = -40 \text{ to } 125^\circ\text{C}$			0.8	V	
V_{IH}	Control Input Logic High	$T_a = -40 \text{ to } 125^\circ\text{C}$	2			V	
I_I	Control Input Current	$V_I = 6 \text{ V}$, $V_C = 6 \text{ V}$		10		μA	
C_O	Output Bypass Capacitance	ESR = 0.1 to 10 Ω $I_O = 0 \text{ to } 500 \text{ mA}$	2	10		μF	

ELECTRICAL CHARACTERISTICS FOR KF15 (refer to the test circuits, $T_j = 25^\circ\text{C}$, $C_1 = 0.1 \mu\text{F}$, $C_O = 2.2 \mu\text{F}$ unless otherwise specified.)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_O	Output Voltage	$I_O = 50 \text{ mA}$, $V_I = 3.5 \text{ V}$	1.47	1.5	1.53	V
		$I_O = 50 \text{ mA}$, $V_I = 3.5 \text{ V}$, $T_a = -25 \text{ to } 85^\circ\text{C}$	1.44		1.56	
V_I	Operating Input Voltage	$I_O = 500 \text{ mA}$	2.5		20	V
I_O	Output Current Limit			1		A
ΔV_O	Line Regulation	$V_I = 2.5 \text{ to } 20 \text{ V}$, $I_O = 5 \text{ mA}$		2	12	mV
ΔV_O	Load Regulation	$V_I = 2.8 \text{ V}$, $I_O = 5 \text{ to } 500 \text{ mA}$		2	50	mV
I_d	Quiescent Current	$V_I = 2.5 \text{ to } 20\text{V}$, $I_O = 0\text{mA}$ (ON MODE)		0.5	1	mA
		$V_I = 2.8 \text{ to } 20\text{V}$, $I_O = 500\text{mA}$			12	
		$V_I = 6 \text{ V}$ (OFF MODE)		50	100	μA
SVR	Supply Voltage Rejection	$I_O = 5 \text{ mA}$ $V_I = 3.5 \pm 1 \text{ V}$	$f = 120 \text{ Hz}$	82		dB
			$f = 1 \text{ KHz}$	77		
			$f = 10 \text{ KHz}$	60		
eN	Output Noise Voltage	$B = 10 \text{ Hz to } 100 \text{ KHz}$		50		μV
V_d	Dropout Voltage	$I_O = 200 \text{ mA}$		1		V
V_{IL}	Control Input Logic Low	$T_a = -40 \text{ to } 125^\circ\text{C}$			0.8	V
V_{IH}	Control Input Logic High	$T_a = -40 \text{ to } 125^\circ\text{C}$	2			V
I_I	Control Input Current	$V_I = 6 \text{ V}$, $V_C = 6 \text{ V}$		10		μA
C_O	Output Bypass Capacitance	$\text{ESR} = 0.1 \text{ to } 10 \Omega$, $I_O = 0 \text{ to } 500 \text{ mA}$	2	10		μF

ELECTRICAL CHARACTERISTICS FOR KF25 (refer to the test circuits, $T_j = 25^\circ\text{C}$, $C_1 = 0.1 \mu\text{F}$, $C_O = 2.2 \mu\text{F}$ unless otherwise specified.)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_O	Output Voltage	$I_O = 50 \text{ mA}$, $V_I = 4.5 \text{ V}$	2.45	2.5	2.55	V
		$I_O = 50 \text{ mA}$, $V_I = 4.5 \text{ V}$, $T_a = -25 \text{ to } 85^\circ\text{C}$	2.4		2.6	
V_I	Operating Input Voltage	$I_O = 500 \text{ mA}$			20	V
I_O	Output Current Limit			1		A
ΔV_O	Line Regulation	$V_I = 3.5 \text{ to } 20 \text{ V}$, $I_O = 5 \text{ mA}$		2	12	mV
ΔV_O	Load Regulation	$V_I = 3.8 \text{ V}$, $I_O = 5 \text{ to } 500 \text{ mA}$		2	50	mV
I_d	Quiescent Current	$V_I = 3.5 \text{ to } 20\text{V}$, $I_O = 0\text{mA}$ (ON MODE)		0.5	1	mA
		$V_I = 3.8 \text{ to } 20\text{V}$, $I_O = 500\text{mA}$			12	
		$V_I = 6 \text{ V}$ (OFF MODE)		50	100	μA
SVR	Supply Voltage Rejection	$I_O = 5 \text{ mA}$ $V_I = 4.5 \pm 1 \text{ V}$	$f = 120 \text{ Hz}$	82		dB
			$f = 1 \text{ KHz}$	77		
			$f = 10 \text{ KHz}$	60		
eN	Output Noise Voltage	$B = 10 \text{ Hz to } 100 \text{ KHz}$		50		μV
V_d	Dropout Voltage	$I_O = 200 \text{ mA}$		0.2	0.35	V
		$I_O = 500 \text{ mA}$		0.4	0.7	
V_{IL}	Control Input Logic Low	$T_a = -40 \text{ to } 125^\circ\text{C}$			0.8	V
V_{IH}	Control Input Logic High	$T_a = -40 \text{ to } 125^\circ\text{C}$	2			V
I_I	Control Input Current	$V_I = 6 \text{ V}$, $V_C = 6 \text{ V}$		10		μA
C_O	Output Bypass Capacitance	$\text{ESR} = 0.1 \text{ to } 10 \Omega$, $I_O = 0 \text{ to } 500 \text{ mA}$	2	10		μF

ELECTRICAL CHARACTERISTICS FOR KF27 (refer to the test circuits, $T_j = 25^\circ\text{C}$, $C_1 = 0.1 \mu\text{F}$, $C_O = 2.2 \mu\text{F}$ unless otherwise specified.)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_O	Output Voltage	$I_O = 50 \text{ mA}$, $V_I = 4.7 \text{ V}$	2.646	2.7	2.754	V
		$I_O = 50 \text{ mA}$, $V_I = 4.7 \text{ V}$, $T_a = -25 \text{ to } 85^\circ\text{C}$	2.592		2.808	
V_I	Operating Input Voltage	$I_O = 500 \text{ mA}$			20	V
I_O	Output Current Limit			1		A
ΔV_O	Line Regulation	$V_I = 3.7 \text{ to } 20 \text{ V}$, $I_O = 5 \text{ mA}$		2	12	mV
ΔV_O	Load Regulation	$V_I = 4 \text{ V}$, $I_O = 5 \text{ to } 500 \text{ mA}$		2	50	mV
I_d	Quiescent Current	$V_I = 3.7 \text{ to } 20\text{V}$, $I_O = 0\text{mA}$ (ON MODE)		0.5	1	mA
		$V_I = 4 \text{ to } 20\text{V}$, $I_O = 500\text{mA}$			12	
		$V_I = 6 \text{ V}$ (OFF MODE)		50	100	μA
SVR	Supply Voltage Rejection	$I_O = 5 \text{ mA}$ $V_I = 4.7 \pm 1 \text{ V}$	$f = 120 \text{ Hz}$	82		dB
			$f = 1 \text{ KHz}$	77		
			$f = 10 \text{ KHz}$	60		
eN	Output Noise Voltage	$B = 10 \text{ Hz to } 100 \text{ KHz}$		50		μV
V_d	Dropout Voltage	$I_O = 200 \text{ mA}$		0.2	0.35	V
		$I_O = 500 \text{ mA}$		0.4	0.7	
V_{IL}	Control Input Logic Low	$T_a = -40 \text{ to } 125^\circ\text{C}$			0.8	V
V_{IH}	Control Input Logic High	$T_a = -40 \text{ to } 125^\circ\text{C}$	2			V
I_I	Control Input Current	$V_I = 6 \text{ V}$, $V_C = 6 \text{ V}$		10		μA
C_O	Output Bypass Capacitance	$\text{ESR} = 0.1 \text{ to } 10 \Omega$, $I_O = 0 \text{ to } 500 \text{ mA}$	2	10		μF

ELECTRICAL CHARACTERISTICS FOR KF30 (refer to the test circuits, $T_j = 25^\circ\text{C}$, $C_1 = 0.1 \mu\text{F}$, $C_O = 2.2 \mu\text{F}$ unless otherwise specified.)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_O	Output Voltage	$I_O = 50 \text{ mA}$, $V_I = 5 \text{ V}$	2.94	3	3.06	V
		$I_O = 50 \text{ mA}$, $V_I = 5 \text{ V}$, $T_a = -25 \text{ to } 85^\circ\text{C}$	2.88		3.12	
V_I	Operating Input Voltage	$I_O = 500 \text{ mA}$			20	V
I_O	Output Current Limit			1		A
ΔV_O	Line Regulation	$V_I = 4 \text{ to } 20 \text{ V}$, $I_O = 5 \text{ mA}$		2	12	mV
ΔV_O	Load Regulation	$V_I = 4.3 \text{ V}$, $I_O = 5 \text{ to } 500 \text{ mA}$		2	50	mV
I_d	Quiescent Current	$V_I = 4 \text{ to } 20\text{V}$, $I_O = 0\text{mA}$ (ON MODE)		0.5	1	mA
		$V_I = 4.3 \text{ to } 20\text{V}$, $I_O = 500\text{mA}$			12	
		$V_I = 6 \text{ V}$ (OFF MODE)		50	100	μA
SVR	Supply Voltage Rejection	$I_O = 5 \text{ mA}$ $V_I = 5 \pm 1 \text{ V}$	$f = 120 \text{ Hz}$	81		dB
			$f = 1 \text{ KHz}$	76		
			$f = 10 \text{ KHz}$	60		
eN	Output Noise Voltage	$B = 10 \text{ Hz to } 100 \text{ KHz}$		50		μV
V_d	Dropout Voltage	$I_O = 200 \text{ mA}$		0.2	0.35	V
		$I_O = 500 \text{ mA}$		0.4	0.7	
V_{IL}	Control Input Logic Low	$T_a = -40 \text{ to } 125^\circ\text{C}$			0.8	V
V_{IH}	Control Input Logic High	$T_a = -40 \text{ to } 125^\circ\text{C}$	2			V
I_I	Control Input Current	$V_I = 6 \text{ V}$, $V_C = 6 \text{ V}$		10		μA
C_O	Output Bypass Capacitance	$\text{ESR} = 0.1 \text{ to } 10 \Omega$, $I_O = 0 \text{ to } 500 \text{ mA}$	2	10		μF

ELECTRICAL CHARACTERISTICS FOR KF33 (refer to the test circuits, $T_j = 25^\circ\text{C}$, $C_1 = 0.1 \mu\text{F}$, $C_O = 2.2 \mu\text{F}$ unless otherwise specified.)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_O	Output Voltage	$I_O = 50 \text{ mA}$, $V_I = 5.3 \text{ V}$	3.234	3.3	3.366	V
		$I_O = 50 \text{ mA}$, $V_I = 5.3 \text{ V}$, $T_a = -25 \text{ to } 85^\circ\text{C}$	3.168		3.432	
V_I	Operating Input Voltage	$I_O = 500 \text{ mA}$			20	V
I_O	Output Current Limit			1		A
ΔV_O	Line Regulation	$V_I = 4.3 \text{ to } 20 \text{ V}$, $I_O = 5 \text{ mA}$		2	12	mV
ΔV_O	Load Regulation	$V_I = 4.6 \text{ V}$, $I_O = 5 \text{ to } 500 \text{ mA}$		2	50	mV
I_d	Quiescent Current	$V_I = 4.3 \text{ to } 20 \text{ V}$, $I_O = 0 \text{ mA}$ (ON MODE)		0.5	1	mA
		$V_I = 4.6 \text{ to } 20 \text{ V}$, $I_O = 500 \text{ mA}$			12	
		$V_I = 6 \text{ V}$ (OFF MODE)		50	100	μA
SVR	Supply Voltage Rejection	$I_O = 5 \text{ mA}$ $V_I = 5.3 \pm 1 \text{ V}$	$f = 120 \text{ Hz}$	80		dB
			$f = 1 \text{ KHz}$	75		
			$f = 10 \text{ KHz}$	60		
eN	Output Noise Voltage	$B = 10 \text{ Hz to } 100 \text{ KHz}$		50		μV
V_d	Dropout Voltage	$I_O = 200 \text{ mA}$		0.2	0.35	V
		$I_O = 500 \text{ mA}$		0.4	0.7	
V_{IL}	Control Input Logic Low	$T_a = -40 \text{ to } 125^\circ\text{C}$			0.8	V
V_{IH}	Control Input Logic High	$T_a = -40 \text{ to } 125^\circ\text{C}$	2			V
I_I	Control Input Current	$V_I = 6 \text{ V}$, $V_C = 6 \text{ V}$		10		μA
C_O	Output Bypass Capacitance	$\text{ESR} = 0.1 \text{ to } 10 \Omega$, $I_O = 0 \text{ to } 500 \text{ mA}$	2	10		μF

ELECTRICAL CHARACTERISTICS FOR KF35 (refer to the test circuits, $T_j = 25^\circ\text{C}$, $C_1 = 0.1 \mu\text{F}$, $C_O = 2.2 \mu\text{F}$ unless otherwise specified.)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_O	Output Voltage	$I_O = 50 \text{ mA}$, $V_I = 5.5 \text{ V}$	3.43	3.5	3.57	V
		$I_O = 50 \text{ mA}$, $V_I = 5.5 \text{ V}$, $T_a = -25 \text{ to } 85^\circ\text{C}$	3.36		3.64	
V_I	Operating Input Voltage	$I_O = 500 \text{ mA}$			20	V
I_O	Output Current Limit			1		A
ΔV_O	Line Regulation	$V_I = 4.5 \text{ to } 20 \text{ V}$, $I_O = 5 \text{ mA}$		2	12	mV
ΔV_O	Load Regulation	$V_I = 4.8 \text{ V}$, $I_O = 5 \text{ to } 500 \text{ mA}$		2	50	mV
I_d	Quiescent Current	$V_I = 4.5 \text{ to } 20 \text{ V}$, $I_O = 0 \text{ mA}$ (ON MODE)		0.5	1	mA
		$V_I = 4.8 \text{ to } 20 \text{ V}$, $I_O = 500 \text{ mA}$			12	
		$V_I = 6 \text{ V}$ (OFF MODE)		50	100	μA
SVR	Supply Voltage Rejection	$I_O = 5 \text{ mA}$ $V_I = 5.5 \pm 1 \text{ V}$	$f = 120 \text{ Hz}$	79		dB
			$f = 1 \text{ KHz}$	74		
			$f = 10 \text{ KHz}$	60		
eN	Output Noise Voltage	$B = 10 \text{ Hz to } 100 \text{ KHz}$		50		μV
V_d	Dropout Voltage	$I_O = 200 \text{ mA}$		0.2	0.35	V
		$I_O = 500 \text{ mA}$		0.4	0.7	
V_{IL}	Control Input Logic Low	$T_a = -40 \text{ to } 125^\circ\text{C}$			0.8	V
V_{IH}	Control Input Logic High	$T_a = -40 \text{ to } 125^\circ\text{C}$	2			V
I_I	Control Input Current	$V_I = 6 \text{ V}$, $V_C = 6 \text{ V}$		10		μA
C_O	Output Bypass Capacitance	$\text{ESR} = 0.1 \text{ to } 10 \Omega$, $I_O = 0 \text{ to } 500 \text{ mA}$	2	10		μF

ELECTRICAL CHARACTERISTICS FOR KF40 (refer to the test circuits, $T_j = 25^\circ\text{C}$, $C_1 = 0.1 \mu\text{F}$, $C_O = 2.2 \mu\text{F}$ unless otherwise specified.)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_O	Output Voltage	$I_O = 50 \text{ mA}$, $V_I = 6 \text{ V}$	3.92	4	4.08	V
		$I_O = 50 \text{ mA}$, $V_I = 6 \text{ V}$, $T_a = -25 \text{ to } 85^\circ\text{C}$	3.84		4.16	
V_I	Operating Input Voltage	$I_O = 500 \text{ mA}$			20	V
I_O	Output Current Limit			1		A
ΔV_O	Line Regulation	$V_I = 5 \text{ to } 20 \text{ V}$, $I_O = 5 \text{ mA}$		3	18	mV
ΔV_O	Load Regulation	$V_I = 5.3 \text{ V}$, $I_O = 5 \text{ to } 500 \text{ mA}$		2	50	mV
I_d	Quiescent Current	$V_I = 5 \text{ to } 20\text{V}$, $I_O = 0\text{mA}$ (ON MODE)		0.5	1	mA
		$V_I = 5.3 \text{ to } 20\text{V}$, $I_O = 500\text{mA}$			12	
		$V_I = 6 \text{ V}$ (OFF MODE)		50	100	μA
SVR	Supply Voltage Rejection	$I_O = 5 \text{ mA}$ $V_I = 6 \pm 1 \text{ V}$	$f = 120 \text{ Hz}$	78		dB
			$f = 1 \text{ KHz}$	73		
			$f = 10 \text{ KHz}$	60		
eN	Output Noise Voltage	$B = 10 \text{ Hz to } 100 \text{ KHz}$		50		μV
V_d	Dropout Voltage	$I_O = 200 \text{ mA}$		0.2	0.35	V
		$I_O = 500 \text{ mA}$		0.4	0.7	
V_{IL}	Control Input Logic Low	$T_a = -40 \text{ to } 125^\circ\text{C}$			0.8	V
V_{IH}	Control Input Logic High	$T_a = -40 \text{ to } 125^\circ\text{C}$	2			V
I_I	Control Input Current	$V_I = 6 \text{ V}$, $V_C = 6 \text{ V}$		10		μA
C_O	Output Bypass Capacitance	$\text{ESR} = 0.1 \text{ to } 10 \Omega$, $I_O = 0 \text{ to } 500 \text{ mA}$	2	10		μF

ELECTRICAL CHARACTERISTICS FOR KF45 (refer to the test circuits, $T_j = 25^\circ\text{C}$, $C_1 = 0.1 \mu\text{F}$, $C_O = 2.2 \mu\text{F}$ unless otherwise specified.)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_O	Output Voltage	$I_O = 50 \text{ mA}$, $V_I = 6.5 \text{ V}$	4.41	4.5	4.59	V
		$I_O = 50 \text{ mA}$, $V_I = 6.5 \text{ V}$, $T_a = -25 \text{ to } 85^\circ\text{C}$	4.32		4.68	
V_I	Operating Input Voltage	$I_O = 500 \text{ mA}$			20	V
I_O	Output Current Limit			1		A
ΔV_O	Line Regulation	$V_I = 5.5 \text{ to } 20 \text{ V}$, $I_O = 5 \text{ mA}$		3	18	mV
ΔV_O	Load Regulation	$V_I = 5.8 \text{ V}$, $I_O = 5 \text{ to } 500 \text{ mA}$		2	50	mV
I_d	Quiescent Current	$V_I = 5.5 \text{ to } 20\text{V}$, $I_O = 0\text{mA}$ (ON MODE)		0.5	1	mA
		$V_I = 5.8 \text{ to } 20\text{V}$, $I_O = 500\text{mA}$			12	
		$V_I = 6 \text{ V}$ (OFF MODE)		50	100	μA
SVR	Supply Voltage Rejection	$I_O = 5 \text{ mA}$ $V_I = 6.5 \pm 1 \text{ V}$	$f = 120 \text{ Hz}$	77		dB
			$f = 1 \text{ KHz}$	72		
			$f = 10 \text{ KHz}$	60		
eN	Output Noise Voltage	$B = 10 \text{ Hz to } 100 \text{ KHz}$		50		μV
V_d	Dropout Voltage	$I_O = 200 \text{ mA}$		0.2	0.35	V
		$I_O = 500 \text{ mA}$		0.4	0.7	
V_{IL}	Control Input Logic Low	$T_a = -40 \text{ to } 125^\circ\text{C}$			0.8	V
V_{IH}	Control Input Logic High	$T_a = -40 \text{ to } 125^\circ\text{C}$	2			V
I_I	Control Input Current	$V_I = 6 \text{ V}$, $V_C = 6 \text{ V}$		10		μA
C_O	Output Bypass Capacitance	$\text{ESR} = 0.1 \text{ to } 10 \Omega$, $I_O = 0 \text{ to } 500 \text{ mA}$	2	10		μF

ELECTRICAL CHARACTERISTICS FOR KF47 (refer to the test circuits, $T_j = 25^\circ\text{C}$, $C_1 = 0.1 \mu\text{F}$, $C_O = 2.2 \mu\text{F}$ unless otherwise specified.)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_O	Output Voltage	$I_O = 50 \text{ mA}$, $V_I = 6.7 \text{ V}$	4.606	4.7	4.794	V
		$I_O = 50 \text{ mA}$, $V_I = 6.7 \text{ V}$, $T_a = -25 \text{ to } 85^\circ\text{C}$	4.512		4.888	
V_I	Operating Input Voltage	$I_O = 500 \text{ mA}$			20	V
I_O	Output Current Limit			1		A
ΔV_O	Line Regulation	$V_I = 5.7 \text{ to } 20 \text{ V}$, $I_O = 5 \text{ mA}$		3	18	mV
ΔV_O	Load Regulation	$V_I = 6 \text{ V}$, $I_O = 5 \text{ to } 500 \text{ mA}$		2	50	mV
I_d	Quiescent Current	$V_I = 5.7 \text{ to } 20\text{V}$, $I_O = 0\text{mA}$ (ON MODE)		0.5	1	mA
		$V_I = 6 \text{ to } 20\text{V}$, $I_O = 500\text{mA}$			12	
		$V_I = 6 \text{ V}$ (OFF MODE)		50	100	μA
SVR	Supply Voltage Rejection	$I_O = 5 \text{ mA}$ $V_I = 6.7 \pm 1 \text{ V}$	$f = 120 \text{ Hz}$	77		dB
			$f = 1 \text{ KHz}$	72		
			$f = 10 \text{ KHz}$	60		
eN	Output Noise Voltage	$B = 10 \text{ Hz to } 100 \text{ KHz}$		50		μV
V_d	Dropout Voltage	$I_O = 200 \text{ mA}$		0.2	0.35	V
		$I_O = 500 \text{ mA}$		0.4	0.7	
V_{IL}	Control Input Logic Low	$T_a = -40 \text{ to } 125^\circ\text{C}$			0.8	V
V_{IH}	Control Input Logic High	$T_a = -40 \text{ to } 125^\circ\text{C}$	2			V
I_I	Control Input Current	$V_I = 6 \text{ V}$, $V_C = 6 \text{ V}$		10		μA
C_O	Output Bypass Capacitance	$\text{ESR} = 0.1 \text{ to } 10 \Omega$, $I_O = 0 \text{ to } 500 \text{ mA}$	2	10		μF

ELECTRICAL CHARACTERISTICS FOR KF50 (refer to the test circuits, $T_j = 25^\circ\text{C}$, $C_1 = 0.1 \mu\text{F}$, $C_O = 2.2 \mu\text{F}$ unless otherwise specified.)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_O	Output Voltage	$I_O = 50 \text{ mA}$, $V_I = 7 \text{ V}$	4.9	5	5.1	V
		$I_O = 50 \text{ mA}$, $V_I = 7 \text{ V}$, $T_a = -25 \text{ to } 85^\circ\text{C}$	4.8		5.2	
V_I	Operating Input Voltage	$I_O = 500 \text{ mA}$			20	V
I_O	Output Current Limit			1		A
ΔV_O	Line Regulation	$V_I = 6 \text{ to } 20 \text{ V}$, $I_O = 5 \text{ mA}$		3	18	mV
ΔV_O	Load Regulation	$V_I = 6.3 \text{ V}$, $I_O = 5 \text{ to } 500 \text{ mA}$		2	50	mV
I_d	Quiescent Current	$V_I = 6 \text{ to } 20\text{V}$, $I_O = 0\text{mA}$ (ON MODE)		0.5	1	mA
		$V_I = 6.3 \text{ to } 20\text{V}$, $I_O = 500\text{mA}$			12	
		$V_I = 6 \text{ V}$ (OFF MODE)		50	100	μA
SVR	Supply Voltage Rejection	$I_O = 5 \text{ mA}$ $V_I = 7 \pm 1 \text{ V}$	$f = 120 \text{ Hz}$	76		dB
			$f = 1 \text{ KHz}$	71		
			$f = 10 \text{ KHz}$	60		
eN	Output Noise Voltage	$B = 10 \text{ Hz to } 100 \text{ KHz}$		50		μV
V_d	Dropout Voltage	$I_O = 200 \text{ mA}$		0.2	0.35	V
		$I_O = 500 \text{ mA}$		0.4	0.7	
V_{IL}	Control Input Logic Low	$T_a = -40 \text{ to } 125^\circ\text{C}$			0.8	V
V_{IH}	Control Input Logic High	$T_a = -40 \text{ to } 125^\circ\text{C}$	2			V
I_I	Control Input Current	$V_I = 6 \text{ V}$, $V_C = 6 \text{ V}$		10		μA
C_O	Output Bypass Capacitance	$\text{ESR} = 0.1 \text{ to } 10 \Omega$, $I_O = 0 \text{ to } 500 \text{ mA}$	2	10		μF

ELECTRICAL CHARACTERISTICS FOR KF52 (refer to the test circuits, $T_j = 25^\circ\text{C}$, $C_1 = 0.1 \mu\text{F}$, $C_O = 2.2 \mu\text{F}$ unless otherwise specified.)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_O	Output Voltage	$I_O = 50 \text{ mA}$, $V_I = 7.2 \text{ V}$	5.096	5.2	5.304	V
		$I_O = 50 \text{ mA}$, $V_I = 7.2 \text{ V}$, $T_a = -25 \text{ to } 85^\circ\text{C}$	4.992		5.408	
V_I	Operating Input Voltage	$I_O = 500 \text{ mA}$			20	V
I_O	Output Current Limit			1		A
ΔV_O	Line Regulation	$V_I = 6.2 \text{ to } 20 \text{ V}$, $I_O = 5 \text{ mA}$		3	18	mV
ΔV_O	Load Regulation	$V_I = 6.5 \text{ V}$, $I_O = 5 \text{ to } 500 \text{ mA}$		2	50	mV
I_d	Quiescent Current	$V_I = 6.2 \text{ to } 20\text{V}$, $I_O = 0\text{mA}$ (ON MODE)		0.5	1	mA
		$V_I = 6.5 \text{ to } 20\text{V}$, $I_O = 500\text{mA}$			12	
		$V_I = 6 \text{ V}$ (OFF MODE)		50	100	μA
SVR	Supply Voltage Rejection	$I_O = 5 \text{ mA}$ $V_I = 7.2 \pm 1 \text{ V}$	$f = 120 \text{ Hz}$	76		dB
			$f = 1 \text{ KHz}$	71		
			$f = 10 \text{ KHz}$	60		
eN	Output Noise Voltage	$B = 10 \text{ Hz to } 100 \text{ KHz}$		50		μV
V_d	Dropout Voltage	$I_O = 200 \text{ mA}$		0.2	0.35	V
		$I_O = 500 \text{ mA}$		0.4	0.7	
V_{IL}	Control Input Logic Low	$T_a = -40 \text{ to } 125^\circ\text{C}$			0.8	V
V_{IH}	Control Input Logic High	$T_a = -40 \text{ to } 125^\circ\text{C}$	2			V
I_I	Control Input Current	$V_I = 6 \text{ V}$, $V_C = 6 \text{ V}$		10		μA
C_O	Output Bypass Capacitance	$\text{ESR} = 0.1 \text{ to } 10 \Omega$, $I_O = 0 \text{ to } 500 \text{ mA}$	2	10		μF

ELECTRICAL CHARACTERISTICS FOR KF55 (refer to the test circuits, $T_j = 25^\circ\text{C}$, $C_1 = 0.1 \mu\text{F}$, $C_O = 2.2 \mu\text{F}$ unless otherwise specified.)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_O	Output Voltage	$I_O = 50 \text{ mA}$, $V_I = 7.5 \text{ V}$	5.39	5.5	5.61	V
		$I_O = 50 \text{ mA}$, $V_I = 7.5 \text{ V}$, $T_a = -25 \text{ to } 85^\circ\text{C}$	5.28		5.72	
V_I	Operating Input Voltage	$I_O = 500 \text{ mA}$			20	V
I_O	Output Current Limit			1		A
ΔV_O	Line Regulation	$V_I = 6.5 \text{ to } 20 \text{ V}$, $I_O = 5 \text{ mA}$		3	18	mV
ΔV_O	Load Regulation	$V_I = 6.8 \text{ V}$, $I_O = 5 \text{ to } 500 \text{ mA}$		2	50	mV
I_d	Quiescent Current	$V_I = 6.5 \text{ to } 20\text{V}$, $I_O = 0\text{mA}$ (ON MODE)		0.5	1	mA
		$V_I = 6.8 \text{ to } 20\text{V}$, $I_O = 500\text{mA}$			12	
		$V_I = 6 \text{ V}$ (OFF MODE)		50	100	μA
SVR	Supply Voltage Rejection	$I_O = 5 \text{ mA}$ $V_I = 7.5 \pm 1 \text{ V}$	$f = 120 \text{ Hz}$	76		dB
			$f = 1 \text{ KHz}$	71		
			$f = 10 \text{ KHz}$	60		
eN	Output Noise Voltage	$B = 10 \text{ Hz to } 100 \text{ KHz}$		50		μV
V_d	Dropout Voltage	$I_O = 200 \text{ mA}$		0.2	0.35	V
		$I_O = 500 \text{ mA}$		0.4	0.7	
V_{IL}	Control Input Logic Low	$T_a = -40 \text{ to } 125^\circ\text{C}$			0.8	V
V_{IH}	Control Input Logic High	$T_a = -40 \text{ to } 125^\circ\text{C}$	2			V
I_I	Control Input Current	$V_I = 6 \text{ V}$, $V_C = 6 \text{ V}$		10		μA
C_O	Output Bypass Capacitance	$\text{ESR} = 0.1 \text{ to } 10 \Omega$, $I_O = 0 \text{ to } 500 \text{ mA}$	2	10		μF

ELECTRICAL CHARACTERISTICS FOR KF60 (refer to the test circuits, $T_j = 25^\circ\text{C}$, $C_1 = 0.1 \mu\text{F}$, $C_0 = 2.2 \mu\text{F}$ unless otherwise specified.)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_O	Output Voltage	$I_O = 50 \text{ mA}$, $V_I = 8 \text{ V}$	5.88	6	6.12	V
		$I_O = 50 \text{ mA}$, $V_I = 8 \text{ V}$, $T_a = -25 \text{ to } 85^\circ\text{C}$	5.76		6.24	
V_I	Operating Input Voltage	$I_O = 500 \text{ mA}$			20	V
I_O	Output Current Limit			1		A
ΔV_O	Line Regulation	$V_I = 7 \text{ to } 20 \text{ V}$, $I_O = 5 \text{ mA}$		4	24	mV
ΔV_O	Load Regulation	$V_I = 7.3 \text{ V}$, $I_O = 5 \text{ to } 500 \text{ mA}$		2	50	mV
I_d	Quiescent Current	$V_I = 7 \text{ to } 20\text{V}$, $I_O = 0\text{mA}$ (ON MODE)		0.7	1.5	mA
		$V_I = 7.3 \text{ to } 20\text{V}$, $I_O = 500\text{mA}$			12	
		$V_I = 9 \text{ V}$ (OFF MODE)		70	140	μA
SVR	Supply Voltage Rejection	$I_O = 5 \text{ mA}$ $V_I = 8 \pm 1 \text{ V}$	$f = 120 \text{ Hz}$	75		dB
			$f = 1 \text{ KHz}$	70		
			$f = 10 \text{ KHz}$	60		
eN	Output Noise Voltage	$B = 10 \text{ Hz to } 100 \text{ KHz}$		50		μV
V_d	Dropout Voltage	$I_O = 200 \text{ mA}$		0.2	0.35	V
		$I_O = 500 \text{ mA}$		0.4	0.7	
V_{IL}	Control Input Logic Low	$T_a = -40 \text{ to } 125^\circ\text{C}$			0.8	V
V_{IH}	Control Input Logic High	$T_a = -40 \text{ to } 125^\circ\text{C}$	2			V
I_I	Control Input Current	$V_I = 9 \text{ V}$, $V_C = 6 \text{ V}$		10		μA
C_O	Output Bypass Capacitance	$\text{ESR} = 0.1 \text{ to } 10 \Omega$, $I_O = 0 \text{ to } 500 \text{ mA}$	2	10		μF

ELECTRICAL CHARACTERISTICS FOR KF80B (refer to the test circuits, $T_j = 25^\circ\text{C}$, $C_1 = 0.1 \mu\text{F}$, $C_0 = 2.2 \mu\text{F}$ unless otherwise specified.)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_O	Output Voltage	$I_O = 50 \text{ mA}$, $V_I = 10 \text{ V}$	7.84	8	8.16	V
		$I_O = 50 \text{ mA}$, $V_I = 10 \text{ V}$, $T_a = -25 \text{ to } 85^\circ\text{C}$	7.68		8.32	
V_I	Operating Input Voltage	$I_O = 500 \text{ mA}$			20	V
I_O	Output Current Limit			1		A
ΔV_O	Line Regulation	$V_I = 9 \text{ to } 20 \text{ V}$, $I_O = 5 \text{ mA}$		4	24	mV
ΔV_O	Load Regulation	$V_I = 9.3 \text{ V}$, $I_O = 5 \text{ to } 500 \text{ mA}$		2	50	mV
I_d	Quiescent Current	$V_I = 9 \text{ to } 20\text{V}$, $I_O = 0\text{mA}$ (ON MODE)		0.7	1.5	mA
		$V_I = 9.3 \text{ to } 20\text{V}$, $I_O = 500\text{mA}$			12	
		$V_I = 9 \text{ V}$ (OFF MODE)		70	140	μA
SVR	Supply Voltage Rejection	$I_O = 5 \text{ mA}$ $V_I = 10 \pm 1 \text{ V}$	$f = 120 \text{ Hz}$	72		dB
			$f = 1 \text{ KHz}$	67		
			$f = 10 \text{ KHz}$	60		
eN	Output Noise Voltage	$B = 10 \text{ Hz to } 100 \text{ KHz}$		50		μV
V_d	Dropout Voltage	$I_O = 200 \text{ mA}$		0.2	0.35	V
		$I_O = 500 \text{ mA}$		0.4	0.7	
V_{IL}	Control Input Logic Low	$T_a = -40 \text{ to } 125^\circ\text{C}$			0.8	V
V_{IH}	Control Input Logic High	$T_a = -40 \text{ to } 125^\circ\text{C}$	2			V
I_I	Control Input Current	$V_I = 9 \text{ V}$, $V_C = 6 \text{ V}$		10		μA
C_O	Output Bypass Capacitance	$\text{ESR} = 0.1 \text{ to } 10 \Omega$, $I_O = 0 \text{ to } 500 \text{ mA}$	2	10		μF

ELECTRICAL CHARACTERISTICS FOR KF85B (refer to the test circuits, $T_j = 25^\circ\text{C}$, $C_1 = 0.1 \mu\text{F}$, $C_O = 2.2 \mu\text{F}$ unless otherwise specified.)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_O	Output Voltage	$I_O = 50 \text{ mA}$, $V_I = 10.5 \text{ V}$	8.33	8.5	8.67	V
		$I_O = 50 \text{ mA}$, $V_I = 10.5 \text{ V}$, $T_a = -25 \text{ to } 85^\circ\text{C}$	8.16		8.84	
V_I	Operating Input Voltage	$I_O = 500 \text{ mA}$			20	V
I_O	Output Current Limit			1		A
ΔV_O	Line Regulation	$V_I = 9.5 \text{ to } 20 \text{ V}$, $I_O = 5 \text{ mA}$		4	24	mV
ΔV_O	Load Regulation	$V_I = 9.8 \text{ V}$, $I_O = 5 \text{ to } 500 \text{ mA}$		2	50	mV
I_d	Quiescent Current	$V_I = 9.5 \text{ to } 20 \text{ V}$, $I_O = 0 \text{ mA}$ (ON MODE)		0.7	1.5	mA
		$V_I = 9.8 \text{ to } 20 \text{ V}$, $I_O = 500 \text{ mA}$			12	
		$V_I = 10 \text{ V}$ (OFF MODE)		70	140	μA
SVR	Supply Voltage Rejection	$I_O = 5 \text{ mA}$ $V_I = 10.5 \pm 1 \text{ V}$	$f = 120 \text{ Hz}$	67		dB
			$f = 1 \text{ KHz}$	63		
			$f = 10 \text{ KHz}$	53		
eN	Output Noise Voltage	$B = 10 \text{ Hz to } 100 \text{ KHz}$		50		μV
V_d	Dropout Voltage	$I_O = 200 \text{ mA}$		0.2	0.35	V
		$I_O = 500 \text{ mA}$		0.4	0.7	
V_{IL}	Control Input Logic Low	$T_a = -40 \text{ to } 125^\circ\text{C}$			0.8	V
V_{IH}	Control Input Logic High	$T_a = -40 \text{ to } 125^\circ\text{C}$	2			V
I_I	Control Input Current	$V_I = 10 \text{ V}$, $V_C = 6 \text{ V}$		10		μA
C_O	Output Bypass Capacitance	$\text{ESR} = 0.1 \text{ to } 10 \Omega$, $I_O = 0 \text{ to } 500 \text{ mA}$	2	10		μF

ELECTRICAL CHARACTERISTICS FOR KF120B (refer to the test circuits, $T_j = 25^\circ\text{C}$, $C_1 = 0.1 \mu\text{F}$, $C_O = 2.2 \mu\text{F}$ unless otherwise specified.)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_O	Output Voltage	$I_O = 50 \text{ mA}$, $V_I = 14 \text{ V}$	11.76	12	12.24	V
		$I_O = 50 \text{ mA}$, $V_I = 14 \text{ V}$, $T_a = -25 \text{ to } 85^\circ\text{C}$	11.52		12.48	
V_I	Operating Input Voltage	$I_O = 500 \text{ mA}$			20	V
I_O	Output Current Limit			1		A
ΔV_O	Line Regulation	$V_I = 13 \text{ to } 20 \text{ V}$, $I_O = 5 \text{ mA}$		8	48	mV
ΔV_O	Load Regulation	$V_I = 13.3 \text{ V}$, $I_O = 5 \text{ to } 500 \text{ mA}$		2	50	mV
I_d	Quiescent Current	$V_I = 13 \text{ to } 20 \text{ V}$, $I_O = 0 \text{ mA}$ (ON MODE)		0.7	1.5	mA
		$V_I = 13.3 \text{ to } 20 \text{ V}$, $I_O = 500 \text{ mA}$			12	
		$V_I = 13 \text{ V}$ (OFF MODE)		70	140	μA
SVR	Supply Voltage Rejection	$I_O = 5 \text{ mA}$ $V_I = 14 \pm 1 \text{ V}$	$f = 120 \text{ Hz}$	69		dB
			$f = 1 \text{ KHz}$	64		
			$f = 10 \text{ KHz}$	54		
eN	Output Noise Voltage	$B = 10 \text{ Hz to } 100 \text{ KHz}$		50		μV
V_d	Dropout Voltage	$I_O = 200 \text{ mA}$		0.2	0.35	V
		$I_O = 500 \text{ mA}$		0.4	0.7	
V_{IL}	Control Input Logic Low	$T_a = -40 \text{ to } 125^\circ\text{C}$			0.8	V
V_{IH}	Control Input Logic High	$T_a = -40 \text{ to } 125^\circ\text{C}$	2			V
I_I	Control Input Current	$V_I = 13 \text{ V}$, $V_C = 6 \text{ V}$		10		μA
C_O	Output Bypass Capacitance	$\text{ESR} = 0.1 \text{ to } 10 \Omega$, $I_O = 0 \text{ to } 500 \text{ mA}$	2	10		μF

TYPICAL PERFORMANCE CHARACTERISTICS (unless otherwise specified $V_{O(NOM)} = 3.3\text{ V}$)

Figure 1 : Dropout Voltage vs Output Current



Figure 4 : Supply Current vs Input Voltage

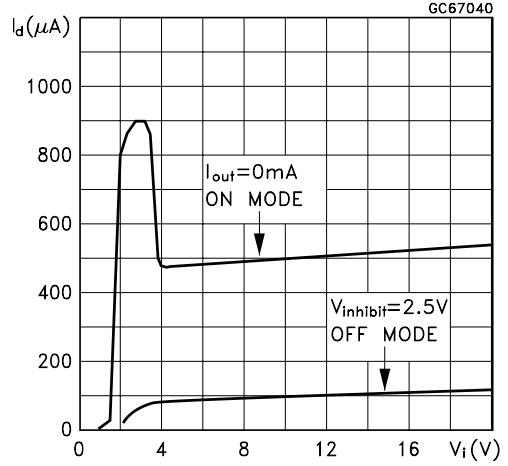


Figure 2 : Dropout Voltage vs Temperature

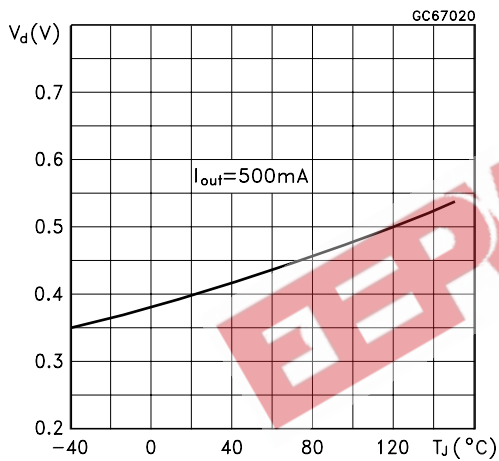


Figure 5 : Short Circuit Current vs Input Voltage

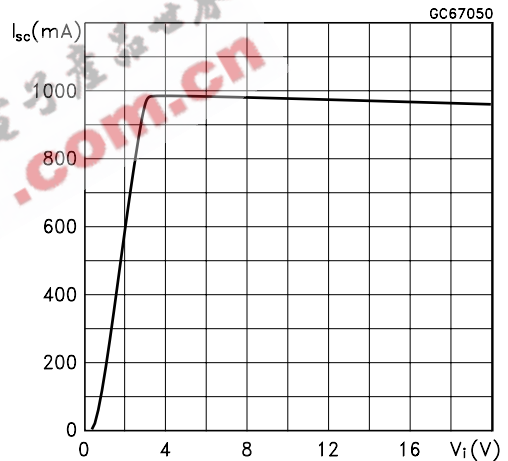


Figure 3 : Supply Current vs Input Voltage

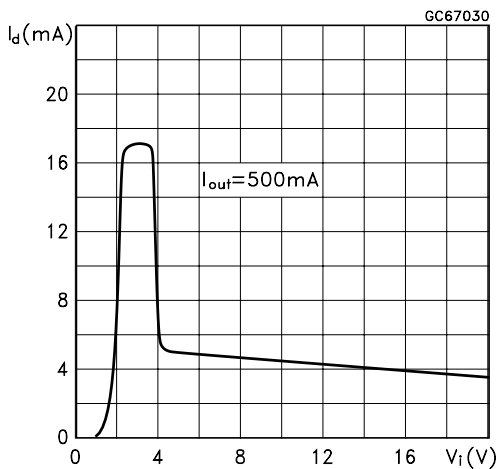
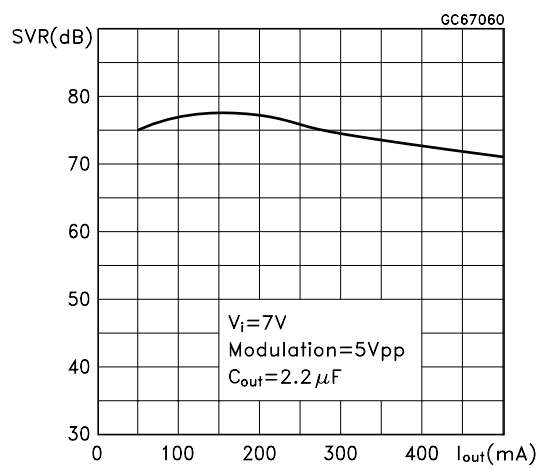
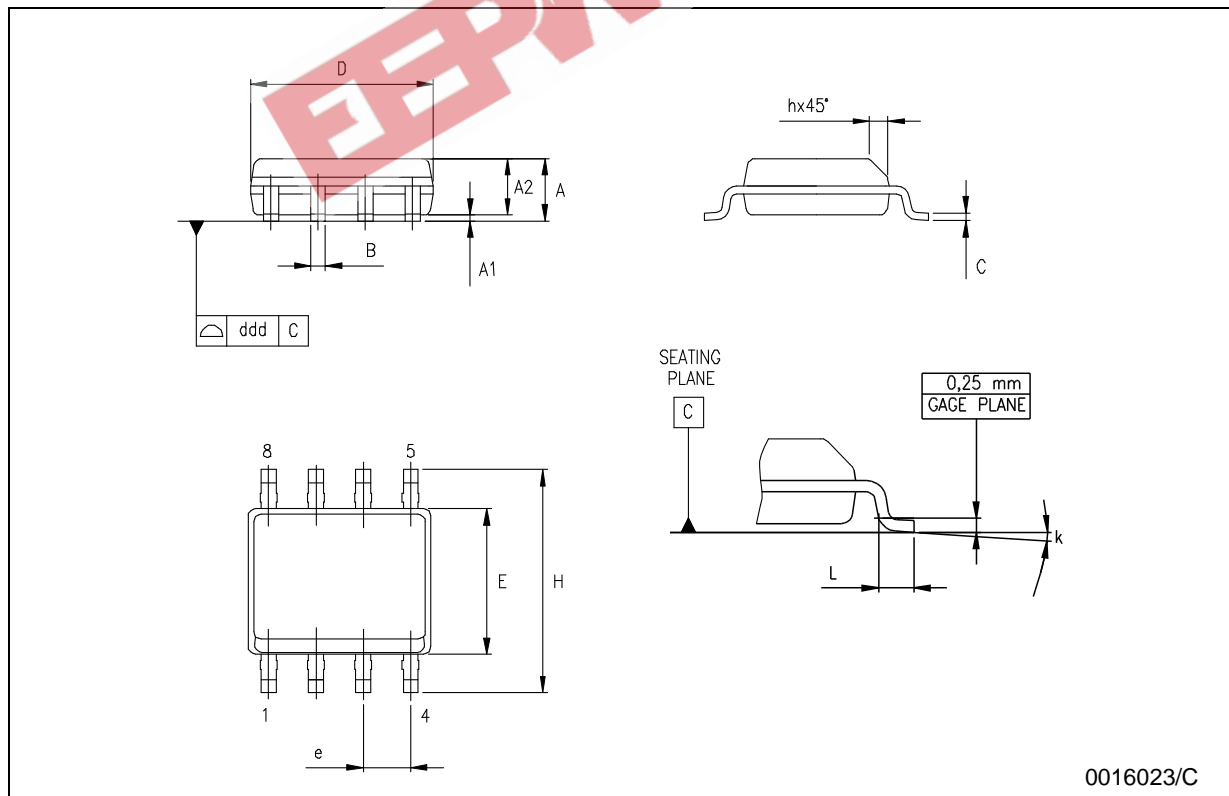


Figure 6 : Supply Voltage Rejection vs Input Voltage



SO-8 MECHANICAL DATA

DIM.	mm.			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	1.35		1.75	0.053		0.069
A1	0.10		0.25	0.04		0.010
A2	1.10		1.65	0.043		0.065
B	0.33		0.51	0.013		0.020
C	0.19		0.25	0.007		0.010
D	4.80		5.00	0.189		0.197
E	3.80		4.00	0.150		0.157
e		1.27			0.050	
H	5.80		6.20	0.228		0.244
h	0.25		0.50	0.010		0.020
L	0.40		1.27	0.016		0.050
k	8° (max.)					
ddd			0.1			0.04



DPAK MECHANICAL DATA

DIM.	mm.			inch		
	MIN.	TYP	MAX.	MIN.	TYP.	MAX.
A	2.2		2.4	0.086		0.094
A1	0.9		1.1	0.035		0.043
A2	0.03		0.23	0.001		0.009
B	0.64		0.9	0.025		0.035
B2	5.2		5.4	0.204		0.212
C	0.45		0.6	0.017		0.023
C2	0.48		0.6	0.019		0.023
D	6		6.2	0.236		0.244
D1		5.1			0.200	
E	6.4		6.6	0.252		0.260
E1		4.7			0.185	
e		2.28			0.090	
e1	4.4		4.6	0.173		0.181
H	9.35		10.1	0.368		0.397
L		1			0.039	
(L1)		2.8			0.110	
L2		0.8			0.031	
L4	0.6		1	0.023		0.039



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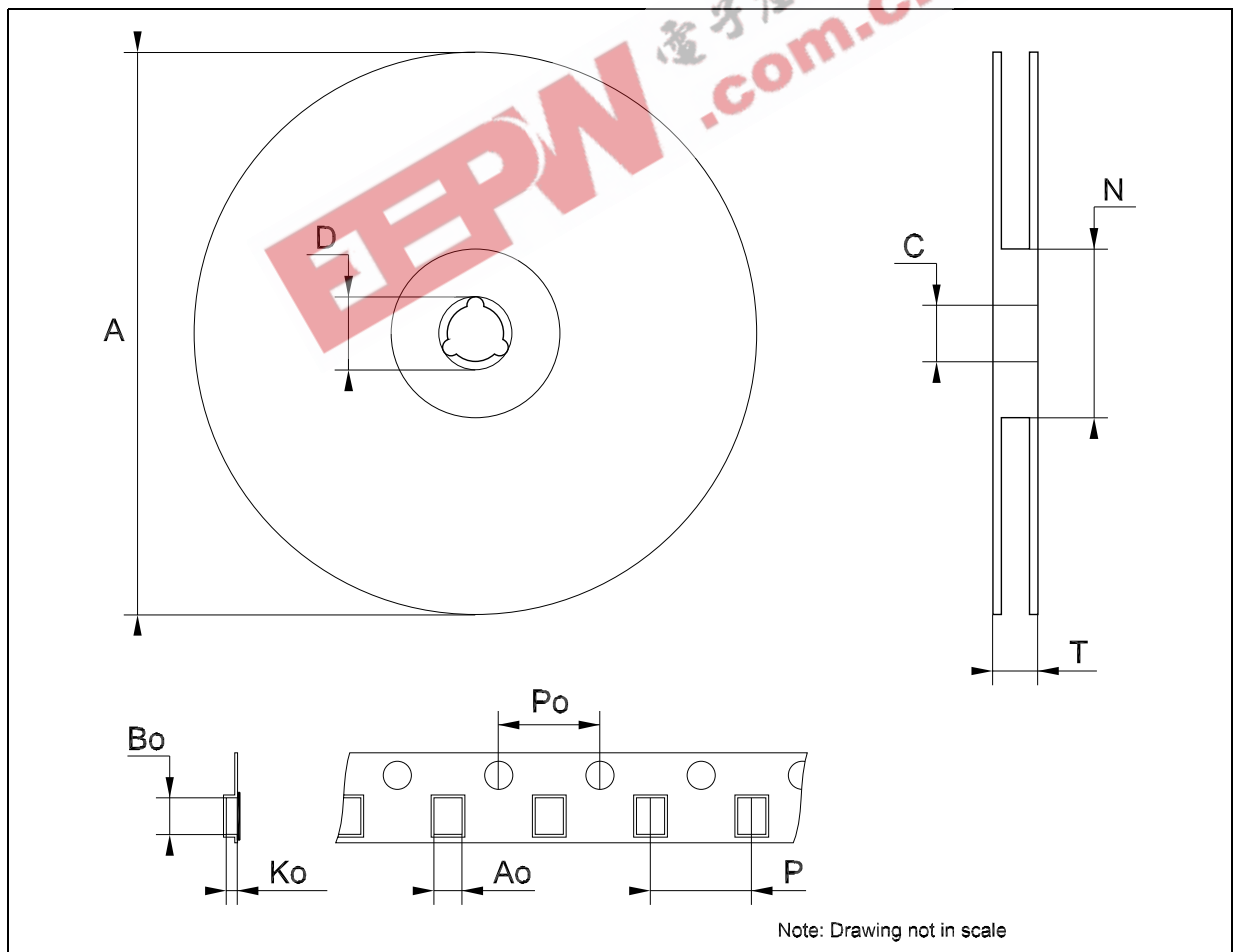
Tape & Reel SO-8 MECHANICAL DATA

DIM.	mm.			inch		
	MIN.	TYP	MAX.	MIN.	TYP.	MAX.
A			330			12.992
C	12.8		13.2	0.504		0.519
D	20.2			0.795		
N	60			2.362		
T			22.4			0.882
Ao	8.1		8.5	0.319		0.335
Bo	5.5		5.9	0.216		0.232
Ko	2.1		2.3	0.082		0.090
Po	3.9		4.1	0.153		0.161
P	7.9		8.1	0.311		0.319



Tape & Reel DPAK-PPAK MECHANICAL DATA

DIM.	mm.			inch		
	MIN.	TYP	MAX.	MIN.	TYP.	MAX.
A			330			12.992
C	12.8	13.0	13.2	0.504	0.512	0.519
D	20.2			0.795		
N	60			2.362		
T			22.4			0.882
Ao	6.80	6.90	7.00	0.268	0.272	0.276
Bo	10.40	10.50	10.60	0.409	0.413	0.417
Ko	2.55	2.65	2.75	0.100	0.104	0.105
Po	3.9	4.0	4.1	0.153	0.157	0.161
P	7.9	8.0	8.1	0.311	0.315	0.319



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