

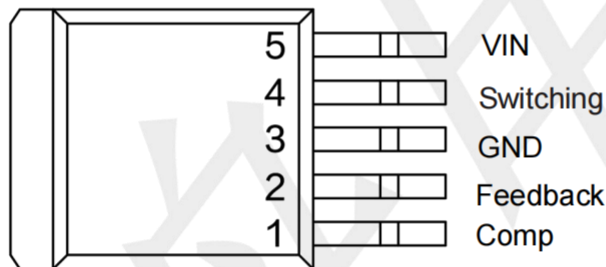
Features

- Standard inductor and transformer series
- NPN output switch current is 5A
- Wide input voltage range: 4V to 40V
- 100kHz switching frequency
- The internal soft start function can reduce surge current during the startup process
- Provide protection for output transistors through current limiting, under voltage locking and thermal shutdown
- The maximum system output voltage tolerance under different line and load conditions is $\pm 4\%$

Applications

- Flyback voltage regulator
- Multi output voltage regulator
- Simple boost regulator
- Forward converter

PIN CONFIGURATION



TO-263-5(TOP VIEW)

Pin Number	Pin Name	Pin Function
1	Comp	Compensating feet
2	Feedback	Adjust Pin
3	GND	Ground Pin
4	Switching	Switching Pin
5	VIN	Input of Supply Voltage

Absolute Maximum Ratings over operating free-air temperature range (unless otherwise noted)

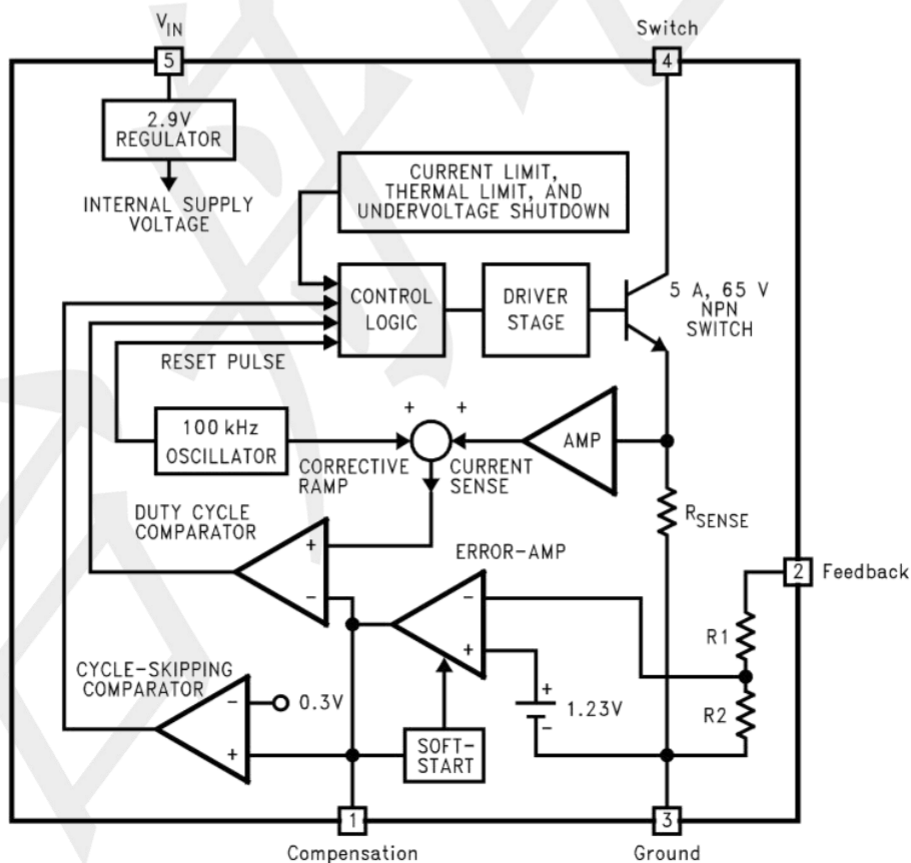
SYMBOL	PARAMETER	RATINGS	UNIT
Input Voltage	Continuous input voltage range	$-0.4V \leq V_{IN} \leq 45V$	V
Switch Voltage	Continuous Switch voltage range	$-0.4V \leq V_{SW} \leq 65V$	V
Switch Current	Switch Pin Current	Internally Limited	A
Comp Voltage	Compensation Pin Voltage	$-0.4V \leq V_{COMP} \leq 2.4V$	V
Feedback Voltage	Feedback Pin Voltage	$-0.4V \leq V_{FB} \leq 2 V_{OUT}$	V
T _{stg}	Storage Temperature Range	$-65^{\circ}C$ to $+150^{\circ}C$	$^{\circ}C$
T _J	Maximum Junction	150 $^{\circ}C$	$^{\circ}C$
Power Dissipation		Internally Limited	W

THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	26	$^{\circ}C/W$
Junction to Case	θ_{JC}	2	$^{\circ}C/W$

Junction-to-ambient thermal resistance for the 5 lead TO-263 mounted horizontally against a PC board area of 0.4896 square inches of 1 oz. copper.

BLOCK DIAGRAM



Electrical Characteristics

(TA=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST Conditions	MIN	TYP	MAX	UNIT
Supply Voltage	V _{IN}		4	--	40	V
Output Switch Voltage	V _{SW}		0	--	60	V
Output Switch Current	I _{SW}		--	--	5	A
Output Voltage	V _{OUT}	V _{IN} = 4V to 10V, I _{LOAD} = 300 mA to 1.2A	11.52	12	12.48	V
Line Regulation	$\Delta V_{OUT} / \Delta V_{IN}$	V _{IN} = 4V to 10V, I _{LOAD} = 300 mA	--	20	100	mV
Load Regulation	$\Delta V_{OUT} / \Delta I_{LOAD}$	V _{IN} = 10V, I _{LOAD} = 300 mA to 1.2A	--	20	100	mV
Efficiency	η	V _{IN} = 10V, I _{LOAD} = 1A	--	90	--	%
Output Reference Voltage	V _{REF}	Measured at Feedback Pin V _{COMP} = 1.0V	1.208	1.230	1.525	V
Reference Voltage Line Regulation	ΔV_{REF}	V _{IN} = 4V to 40V	--	1.5	--	mV
Error Amp Transconductance	G _M	I _{COMP} = -30 μ A to +30 μ A, V _{COMP} = 1.0V	1.8	3.2	6	m Ω
Error Amp Voltage Gain	A _{VOL}	V _{COMP} = 0.5V to 1.6V, R _{COMP} = 1.0 M Ω	400	670	--	V/V
Error Amp Input Bias Current	I _B	V _{COMP} = 1.0V	--	125	425	nA
Input Supply Current	I _S	(Switch Off) See	--	11	15.5	mA
		I _{SWITCH} = 3.0A	--	85	140	mA
Input Supply Undervoltage Lockout	V _{UV}	R _{LOAD} = 100 Ω	3.05	3.30	3.75	V
Oscillator Frequency	f _O	Measured at Switch Pin R _{LOAD} = 100 Ω , V _{COMP} = 1.0V	85	100	115	KHz
Short-Circuit Frequency	f _{SC}	Measured at Switch Pin R _{LOAD} = 100 Ω , V _{FEEDBACK} = 1.15V	25	--	--	KHz
Error Amplifier Output Swing	V _{EAO}	Upper Limit See	2.6	2.8	--	V
		Lower Limit See	--	0.25	0.4	V
Error Amp Output Current (Source or Sink)	I _{EAO}	See	110	165	260	μ A
Junction Temperature Range	T _J		-40°C		+125°C	°C

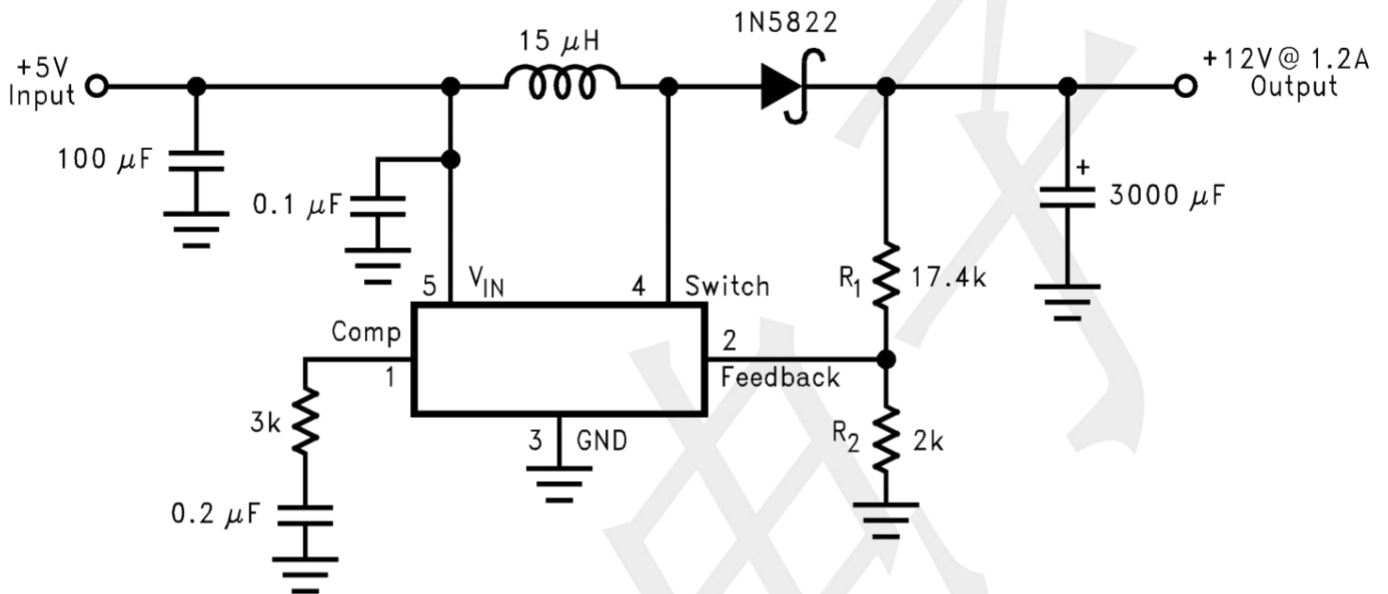
Notes: (1) All room temperature limits are 100% production tested, and all limits at temperature extremes are specified via correlation.

(2) To measure this parameter, the feedback voltage is set to a high value, depending on the output version of the device, to force the error amplifier output low. Adj: VFB = 1.41 V; 3.3 V: VFB = 3.8 V; 5 V: VFB = 5.75 V; 12 V: VFB = 13.8 V.

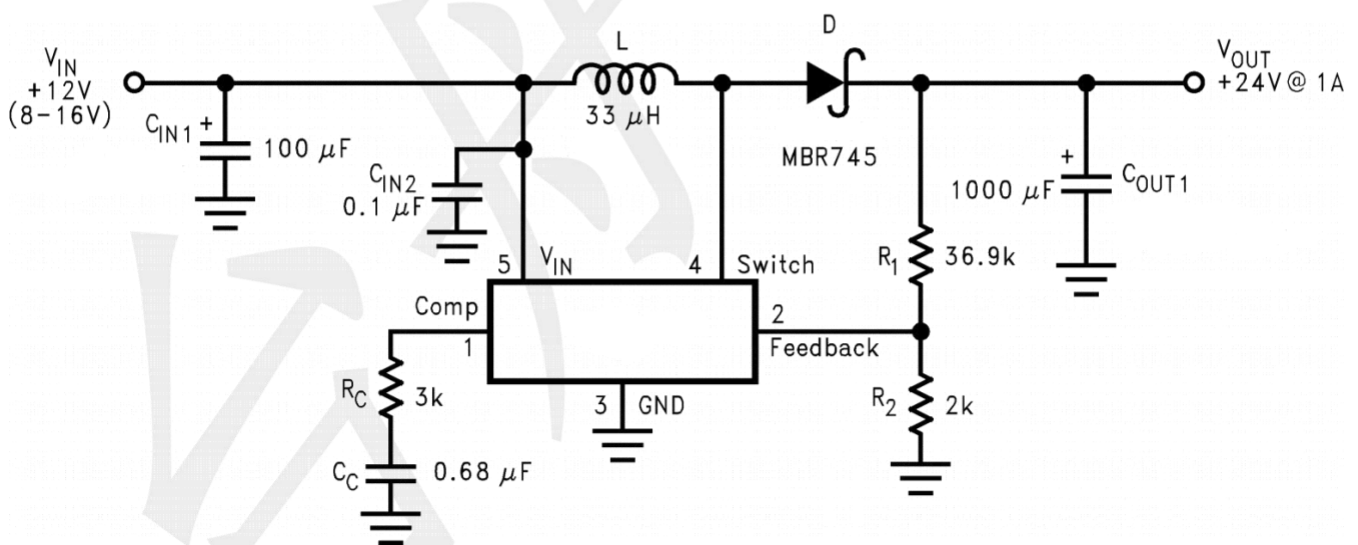
(3) To measure this parameter, the feedback voltage is set to a low value, depending on the output version of the device, to force the error amplifier output high. Adj: VFB = 1.05 V; 3.3 V: VFB = 2.81 V; 5 V: VFB = 4.25 V; 12 V: VFB = 10.2 V.

(4) To measure the worst-case error amplifier output current, the is tested with the feedback voltage set to its low value.

Typical Application Circuit

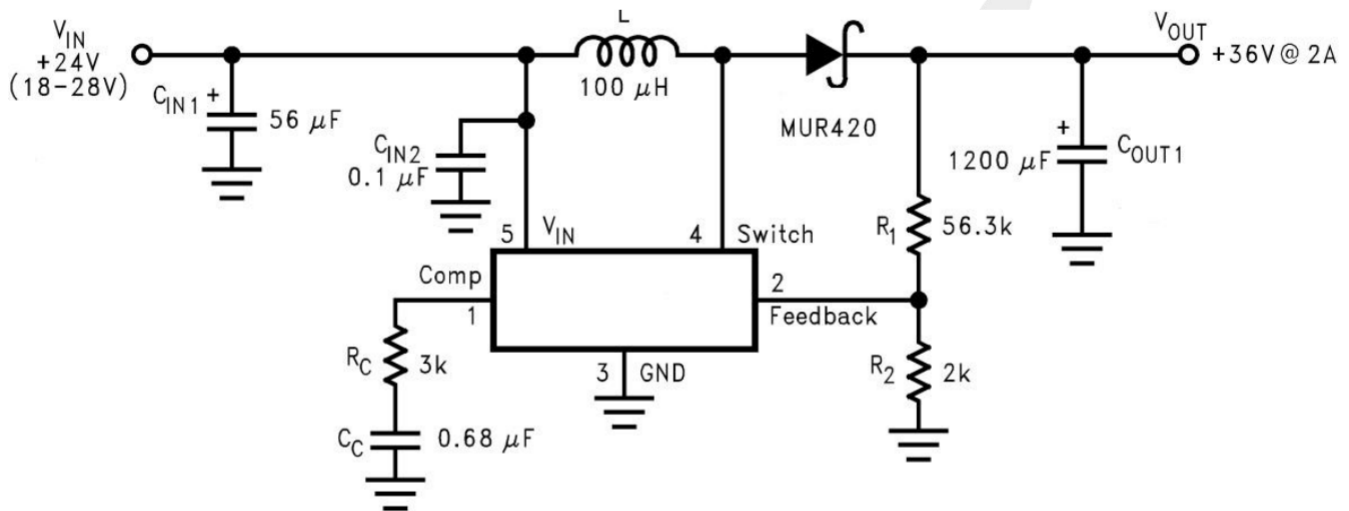


Boost Regulator

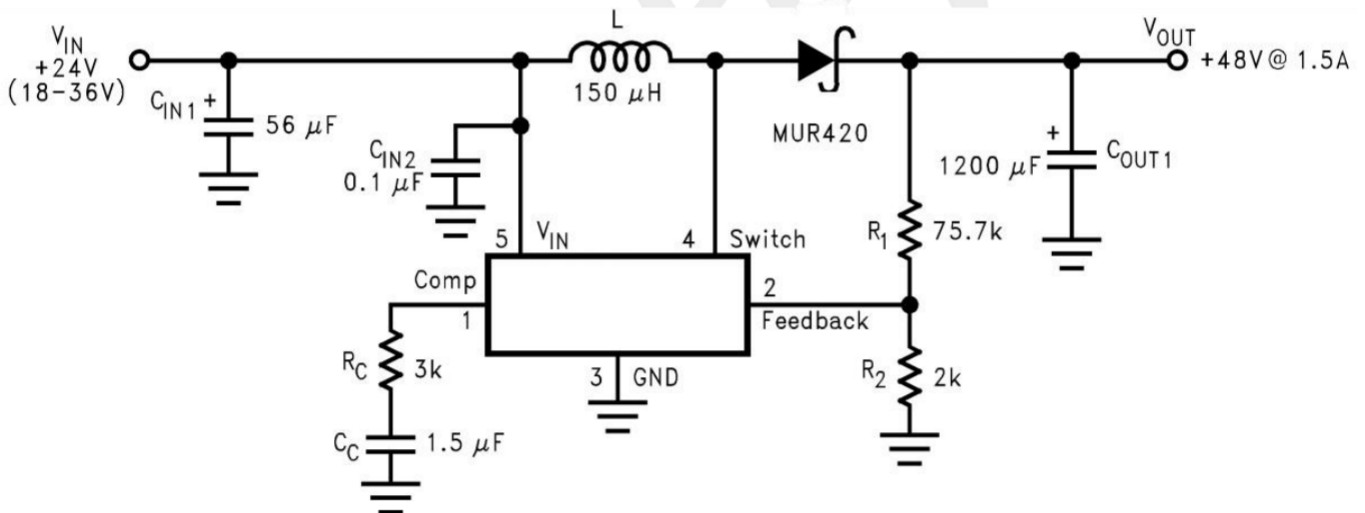


12-V To 24-V Boost Regulator

Typical Application Circuit



24-V To 36-V Boost Regulator



The will require a heat sink in these applications. The size of the heat sink will depend on the maximum ambient temperature. To calculate the thermal resistance of the IC and the size of the heat sink needed.

Typical Characteristics

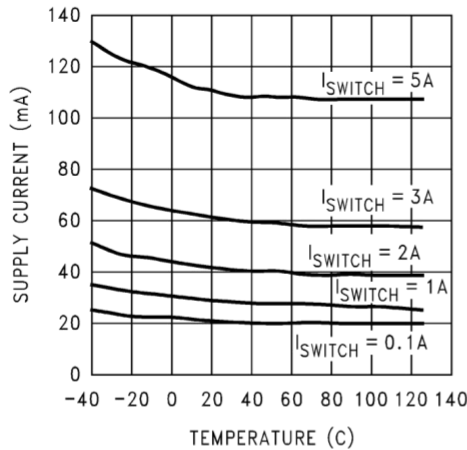


Figure 1. Supply Current vs Temperature

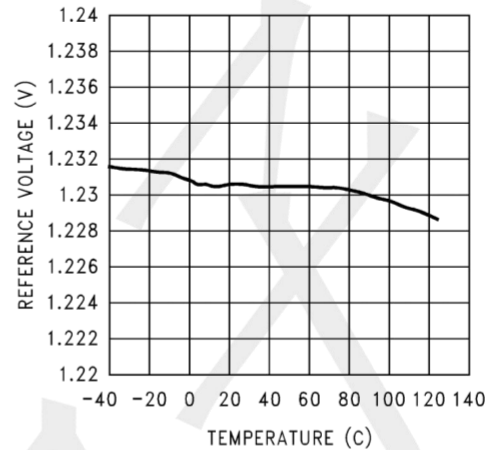


Figure 2. Reference Voltage vs Temperature

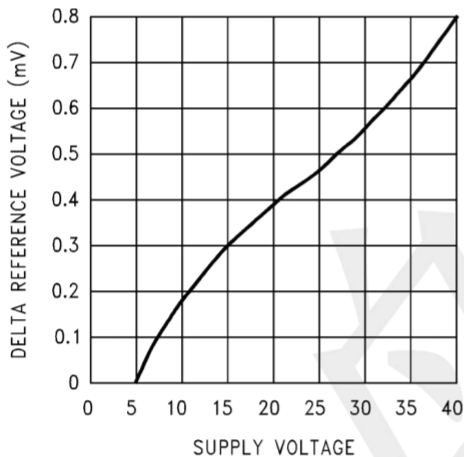


Figure 3. ΔReference Voltage vs Supply Voltage

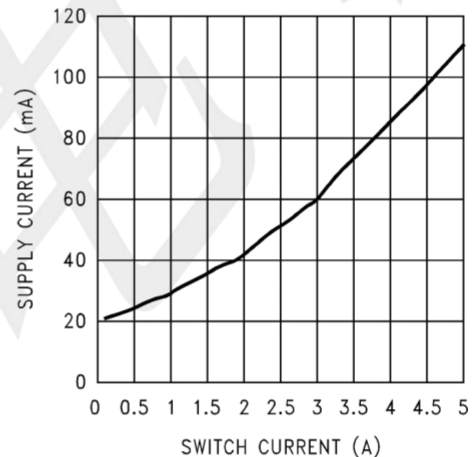


Figure 4. Supply Current vs Switch Current

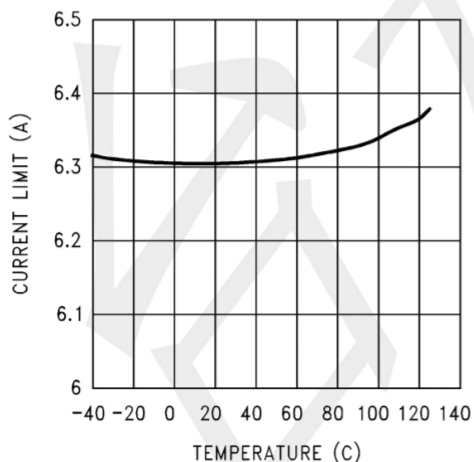


Figure 5. Current Limit vs Temperature

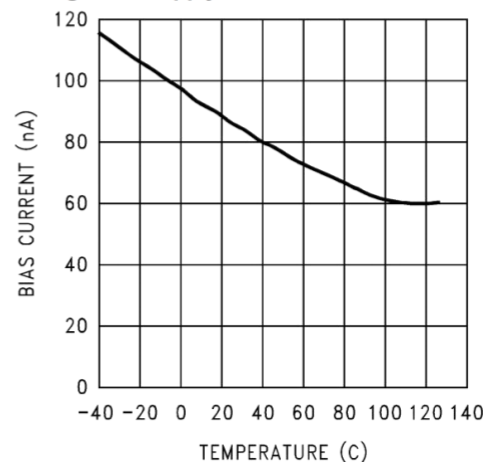


Figure 6. Feedback Pin Bias Current vs Temperature

Typical Characteristics

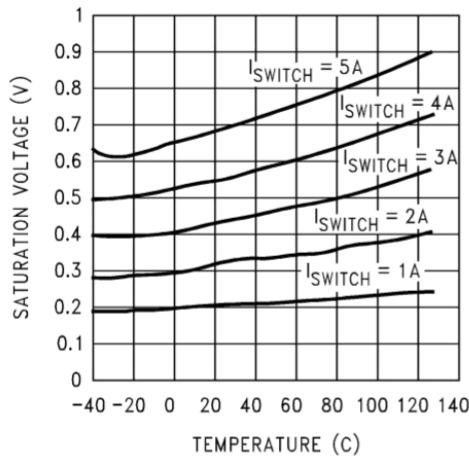


Figure 7. Switch Saturation Voltage vs Temperature

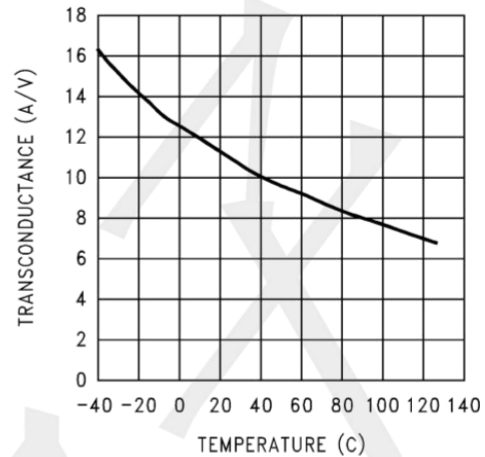


Figure 8. Switch Transconductance vs Temperature

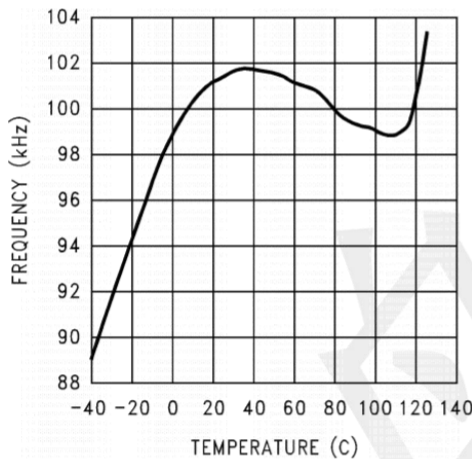


Figure 9. Oscillator Frequency vs Temperature

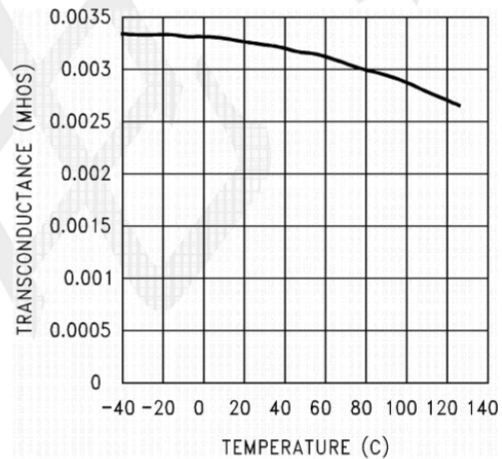


Figure 10. Error Amp Transconductance vs Temperature

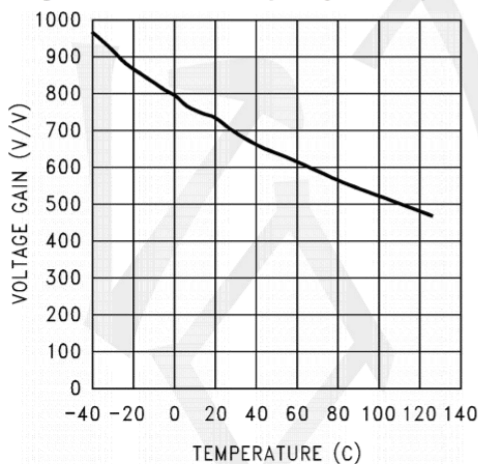


Figure 11. Error Amp Voltage Gain vs Temperature

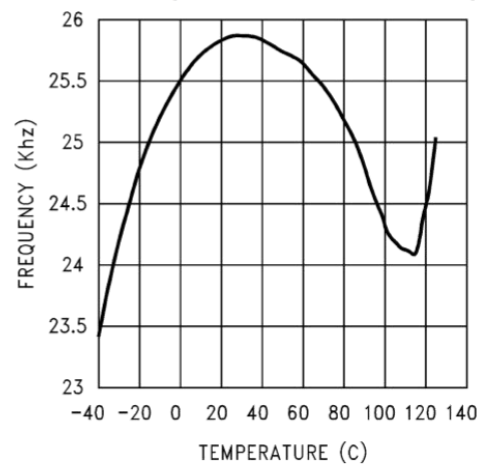
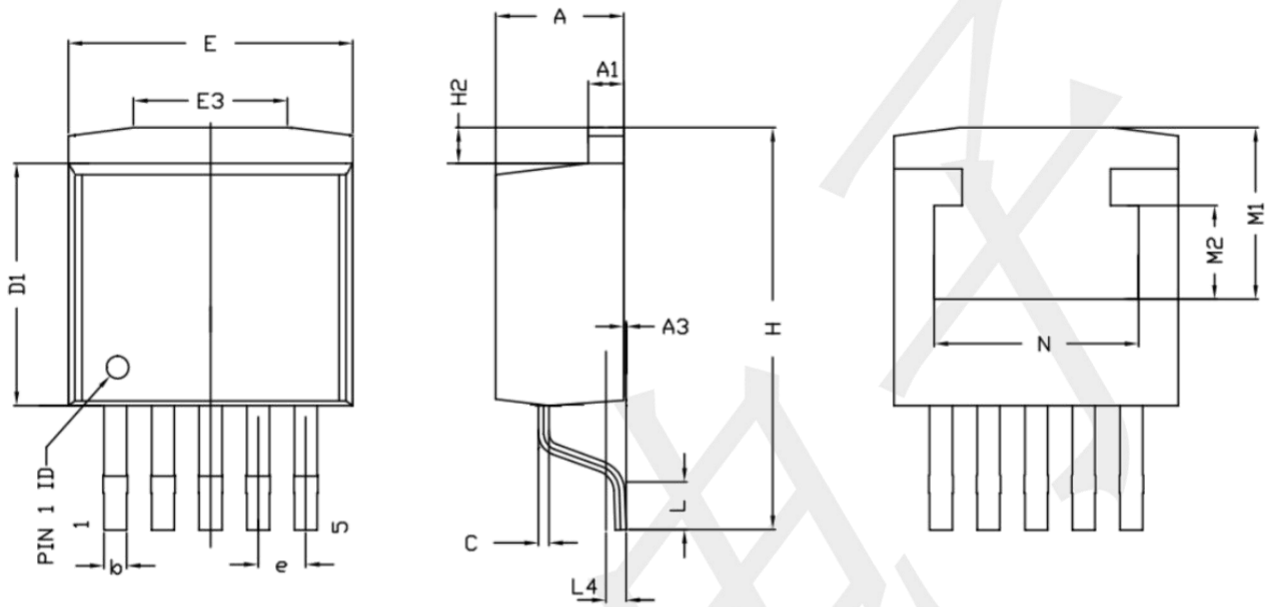


Figure 12. Short Circuit Frequency vs Temperature

Package Outline Dimensions (unit: mm)

TO-263-5



Symbol	Dimensions In Millimeters			Dimensions In Inches		
	Min.	Nom.	Max.	Min.	Nom.	Max.
A	4.45	4.60	4.70	0.175	0.181	0.185
A1	1.22	1.27	1.32	0.048	0.050	0.052
A3	0.00	—	0.15	0.000	—	0.006
b	0.71	—	0.97	0.028	—	0.038
c	0.38	—	0.76	0.015	—	0.030
D1	8.38	8.70	9.00	0.330	0.343	0.354
E	9.91	10.16	10.39	0.390	0.400	0.410
E3	5.00	6.50	8.00	0.197	0.256	0.315
e	1.70 REF.			0.067 REF.		
H	—	—	14.35	—	—	0.565
H2	0.90	1.27	1.42	0.035	0.050	0.056
L	—	1.98	—	—	0.078	—
L4	—	0.76	—	—	0.030	—
M1	—	6.12	—	—	0.241	—
M2	—	3.35	—	—	0.132	—
N	—	7.30	—	—	0.287	—