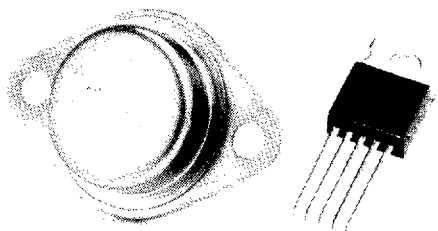


1 AMP DC-TO-DC MINICONVERTERS

SLM1575
SLM2575



FEATURES

- Second source to National's LM1575K, LM2575K, LM2575T
- Military Temperature Range
- Complete DC-to-DC Step-Down converter requiring only 4 support components, fixed voltages
- Wide input voltage range, 7V to 35V
- Wide output voltage range, 1.23V to 31V
- 82% minimum efficiency @ 5V
- Preset output voltages of 5, 12, 15 volts, $\pm 3\%$ Max deviation over Line, Load and Temperature
- Adjustable output, reference voltage $\pm 2\%$ max over line and load conditions
- Inhibit/enable control pin

DESCRIPTION

The SLM1575/SLM2575 Series switching regulators are monolithic integrated circuits designed for use in step-down applications requiring accurate output voltages over combined variations of line, load and temperature. This unique Series greatly simplifies switching power supply design. The SLM1575/SLM2575 Series miniconverters includes a switching regulator and compensation network all within the same package. Just add a choke, catch diode and two capacitors to obtain an efficient Step-Down DC-to-DC converter at 1 amp. Current limit and thermal shutdown features of the SLM1575/SLM2575 Series fully protect the device against overstress conditions.

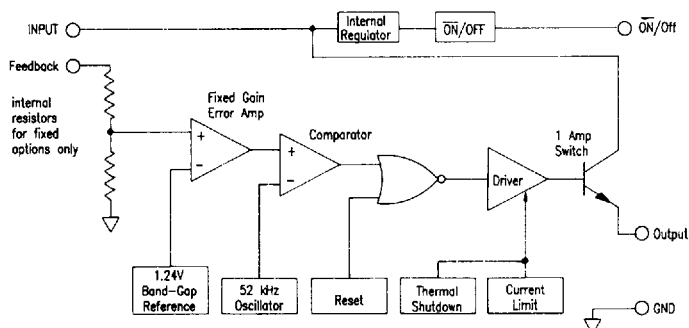
The SLM1575/SLM2575 Series offers replacement for popular 3 terminal linear regulators by providing higher efficiency with reduced heatsink size. In many applications a heatsink will "not" be required.

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	MAXIMUM	UNITS
Input Voltage SLM1575 SLM2575	V_{IN}	40	Volts
On/Off Pin Input Voltage		$-1 \leq V \leq 15$	Volts
Output Voltage to Common (Steady State)		-1	Volts
Power Dissipation	P_D	Internally Limited	Watts
Thermal Resistance TO-220	θ_{JC}	2	$^{\circ}\text{C/W}$
TO-220	θ_{JA}	40	$^{\circ}\text{C/W}$
TO-3	θ_{JC}	1.5	$^{\circ}\text{C/W}$
TO-3	θ_{JA}	35	$^{\circ}\text{C/W}$
Operating Junction Temperature Range TO-220	T_J	-40 to 125	$^{\circ}\text{C}$
TO-3 MIL		-55 to 150	
TO-3 INDUSTRIAL		-40 to 125	
Storage Temperature Range TO-3	T_{STG}	-65 to 150	$^{\circ}\text{C}$
TO-220		-25 to 125	
Lead Temperature (Soldering) 10 Sec. for TO-220	T_{LEAD}	260	$^{\circ}\text{C}$
60 Sec. for TO-3		300	
ESD CLASS		2	

DEVICE SELECTION GUIDE

DEVICE	TEMP RANGE	V_{OUT}	PACKAGE
SLM1575K-5.0	-55 $^{\circ}$ to 150 $^{\circ}\text{C}$	5	TO-3
SLM2575K-5.0	-40 $^{\circ}$ to 125 $^{\circ}\text{C}$	5	TO-3
SLM2575T-5.0	-40 $^{\circ}$ to 125 $^{\circ}\text{C}$	5	TO-220
SLM1575K-12	-55 $^{\circ}\text{C}$ to 150 $^{\circ}\text{C}$	12	TO-3
SLM2575K-12	-40 $^{\circ}\text{C}$ to 125 $^{\circ}\text{C}$	12	TO-3
SLM2575T-12	-40 $^{\circ}\text{C}$ to 125 $^{\circ}\text{C}$	12	TO-220
SLM1575K-15	-55 $^{\circ}\text{C}$ to 150 $^{\circ}\text{C}$	15	TO-3
SLM2575K-15	-40 $^{\circ}\text{C}$ to 125 $^{\circ}\text{C}$	15	TO-3
SLM2575T-15	-40 $^{\circ}\text{C}$ to 125 $^{\circ}\text{C}$	15	TO-220
SLM1575K-ADJ	-55 $^{\circ}\text{C}$ to 150 $^{\circ}\text{C}$	1.23 to 35	TO-3
SLM2575K-ADJ	-40 $^{\circ}\text{C}$ to 125 $^{\circ}\text{C}$	1.23 to 35	TO-3
SLM2575T-ADJ	-40 $^{\circ}\text{C}$ to 125 $^{\circ}\text{C}$	1.23 to 35	TO-220



SLM1575
SLM2575

1 AMP DC-TO-DC MINICONVERTERS

ELECTRICAL CHARACTERISTICS

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Test Conditions: $V_{IN} = 12V$ for 5V and ADJ Options; 25V for 12V; and 30V for 15V Models,
 $V_{OUT} = V_F$ for ADJ, $T_J = 25^\circ C$, unless otherwise specified

Parameter		Symbol	Test Conditions			Test Limits			Units
			V _{IN}	I _O	T _J °C	Min.	Typical	Max.	
Output Voltage	SLM1575-5	V _O	12V	0.2A		4.95	5.0	5.05	Volts
			8V to 35V	0.2A to 1A	Over Temp	4.80 4.85	5.0 5.0	5.20 5.15	
	SLM2575-5		12V	0.2A		4.90	5.0	5.10	
			8V to 35V	0.2A to 1A	Over Temp	4.75 4.85	5.0 5.0	5.25 5.15	
Output Voltage	SLM1575-12	V _O	25V	0.2A		11.88	12.0	12.12	Volts
			15 - 35V	0.2A to 1A	Over Temp	11.52 11.64	12.0 12.0	12.48 12.36	
	SLM2575-12		25V	0.2A		11.76	12.0	12.24	
			15 - 35V	0.2A to 1A	Over Temp	11.40 11.52	12.0 12.0	12.60 12.48	
Output Voltage	SLM1575-15	V _{FB}	30V	0.2A		14.85	15.0	15.15	Volts
			18 - 35V	0.2A to 1A	Over Temp	14.40 14.55	15.0 15.0	15.60 15.45	
	SLM2575-15		30V	0.2A		14.70	15.0	15.30	
			18 - 35V	0.2A to 1A	Over Temp	14.25 14.40	15.0 15.0	15.75 15.60	
Feedback Voltage V _{OUT} = V _{FB}	SLM1575-ADJ	V _{FB}	12V	0.2A		1.217	1.23	1.243	Volts
			8 - 35V	0.2A to 1A	Over Temp	1.193 1.205	1.23 1.23	1.267 1.255	
	SLM2575-ADJ		12V	0.2A		1.217	1.23	1.243	
			8 - 35V	0.2A to 1A	Over Temp	1.156 1.193	1.23 1.23	1.280 1.267	
Feedback Bias Current	SLM1575-ADJ	I _B	12V	0.2A	25		50	100	nA
	SLM2575-ADJ				Over Temp		50	500	
Efficiency SLM1575 SLM2575	Option 5 12 15 ADJ V _O = 5V	n	12V 15V 18V 12V	1A			82 88 88 82		%
Switching Frequency	SLM1575	F _{SW}			47 Over Temp	43	52	58 62	kHz
	SLM2575				Over Temp	47 42		58 63	

1 AMP DC-TO-DC MINICONVERTERS

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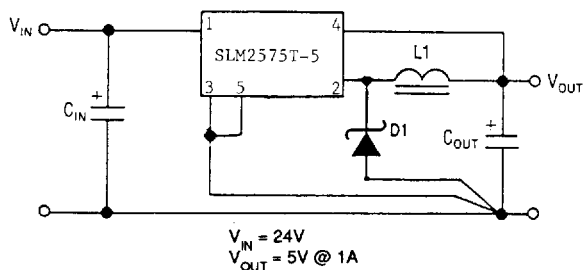
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Parameter	Symbol	Test Conditions			Test Limits			Units
		V_{IN}	I_O	$T_J^{\circ}C$	Min.	Typical	Max.	
Saturation Voltage	V_{SAT}		1A			0.9	1.2	Volts
				Over Temp			1.4	
Max Duty Cycle (On)	DC				93	98		%
Current Limit	I_{CL}		Peak Current		1.7	2.2	3.0	Amps
Peak Current			$T_{on} \leq 3 \text{ usec}$	Over Temp	1.3		3.2	
Output Leakage Current Output = 0V Output = -1V	I_L	35V				7.5	2 30	mA
Quiescent Current SLM-1575	I_Q			Over Temp		5	10 12	μA
Standby Quiescent Current On/Off Pin = 5V	SLM1575 SLM2575 I_{STBY}			Over Temp		50	200	μA
On/Off Pin Logic Input Level $V_{OUT} = 0V$ $V_{OUT} = \text{Option}$	V_{IH} I_{IL}				2.2		1.0	μA
				Over Temp	2.4		0.8	μA
On/Off Pin Input Current On/Off = 5V (Off)	I_{IH}					12	30	μA
On/Off = 0V (On)	I_{IL}		0.2A			0	10	μA

Over temperature -40°C to 125°C for Commercial; -55°C to 150°C Military.

TYPICAL APPLICATION

DC-TO-DC STEP-DOWN CONVERTER



$C_{IN} = 100 \mu F$; $C_{OUT} = 200 \mu F$

D1 = IN5822; L1 = 330 μH

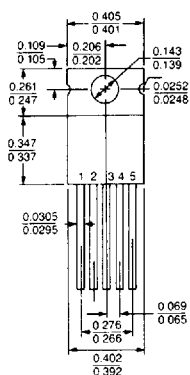
SLM1575
SLM2575

1 AMP DC-TO-DC MINICONVERTERS

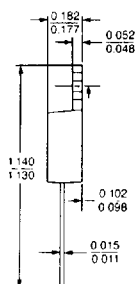
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DEVICE OUTLINE

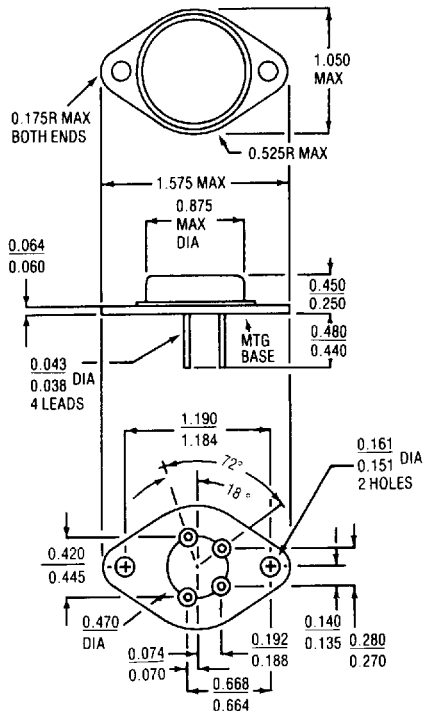
(Front View)



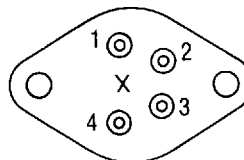
(Side View)



1 — V_{IN}
2 — Output
3 — Ground
4 — Feedback
5 — On/Off
Tab is Ground



Bottom View



1 — On/Off
2 — V_{IN}
3 — Output
4 — Feedback
Case is Ground