

# Low-Output Voltage Low-Saturation Three-Pin Regulator Monolithic IC MM1270

## Outline

MM1270 is targeted at the one-battery output voltage market, and is a compact low input/output voltage differential stable power supply with ultra-low current consumption.

## Features

- |                                      |                   |
|--------------------------------------|-------------------|
| 1. Input voltage                     | 10V max.          |
| 2. Input/output voltage differential | 0.05V typ.        |
| 3. Input current for no load         | 15µA typ.         |
| 4. Output voltage                    | 1.08V, 1.03V typ. |
| 5. Current limiter circuit included  |                   |
| 6. On/Off logic                      |                   |

CE pin	Output
LOW	OFF
HIGH	ON

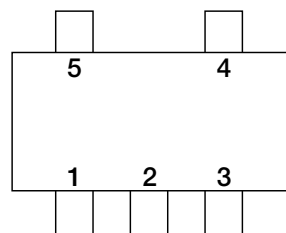
## Package

SOT-25A (MM1270CN, MM1270ZN)

## Applications

1. Pagers
2. Headphone stereos
3. Portable equipment

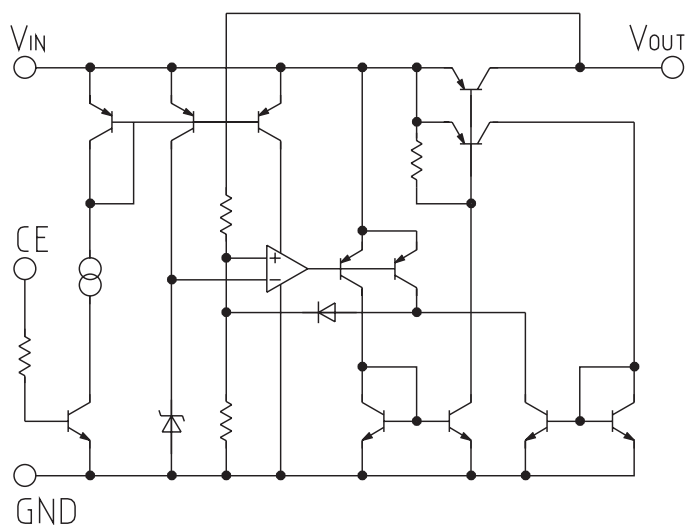
## Pin Assignment



SOT-25A

1	V <sub>OUT</sub>
2	GND
3	GND
4	CE
5	V <sub>IN</sub>

### Equivalent Circuit Diagram



### Absolute Maximum Ratings

Item	Symbol	Rating	Units
Storage temperature	$T_{STG}$	-40~+125	°C
Operating temperature	$T_{OPR}$	-20~+75	°C
Power supply voltage	$V_{CC}$ max.	-0.3~+10	V
CE pin voltage	$V_{CE}$ max.	-0.3~+10	V
Output current	$I_o$ max.	60	mA
Allowable loss	$P_d$	150	mW

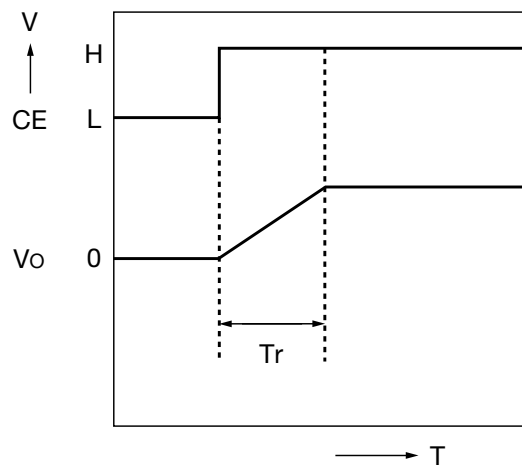
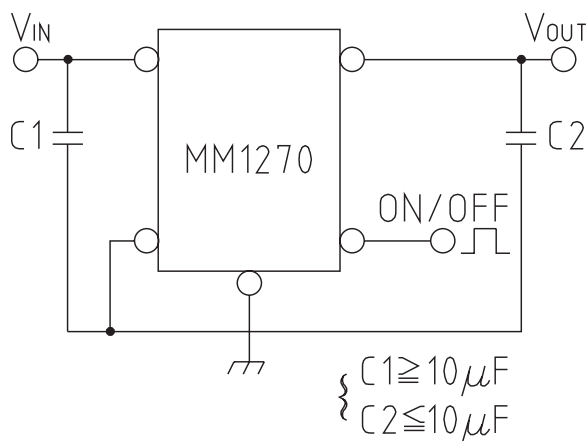
### Recommended Operating Conditions

Input voltage	$V_{IN}$	1.2~2.0	V
Output voltage	$I_o$	0~10.0	mA

**Electrical Characteristics** (Ta=25°C)

Item	Symbol	Measurement conditions	Min.	Typ.	Max.	Units
Output voltage	Z rank	VIN=1.5V Io=1mA	1.05	1.08	1.11	V
	C rank		1.00	1.03	1.06	
	D rank		1.200	1.235	1.270	
No load input current	Iccq1	VIN=1.5V Io=0mA		15	35	μA
Minimum I/O voltage differential	Vd min.	VIN=1.0V Io=5mA		0.05	0.10	V
Input fluctuation ratio	ΔV1	VIN=1.2V~1.25V Io=5mA		3	30	mV
		VIN=1.25V~1.6V Io=5mA		10	20	
Load fluctuation ratio	ΔV2	VIN=1.5V Io=0~5mA		5	20	mV
Output voltage temperature coefficient	ΔVo/T	Tj=-20~+75°C		+800		ppm/°C
Ripple rejection rate	RR	VIN=1.5V f=120Hz VRIPPLE=0.1Vpp Io=5mA		30		dB
Output noise voltage	VN	VIN=Vo+1V Io=100mA f=10~80kHz		150		μVrms
Input current for OFF	Iccq2	VIN=1.5V, VCE=0.2V			1	μA
CE pin current for OFF	I <sub>OFF</sub>	VCE=0.2V	-1			μA
CE pin current for ON	I <sub>ON</sub>	VCE=1.5V			5	μA
CE pin HIGH level	H		0.8		10	V
CE pin LOW level	L		-0.3		0.2	V
Current limit	I max.	VIN=1.5V Ro=0Ω	20	40	60	mA

**Equivalent Circuit Diagram**



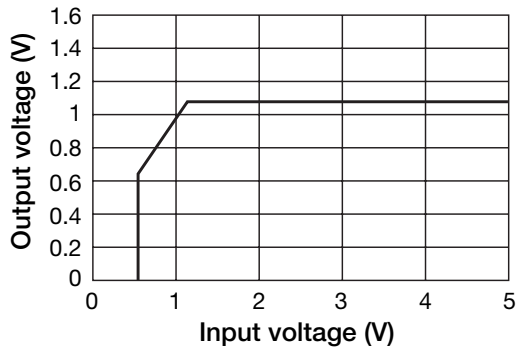
\*Formula for output rise time.

$$Tr (\mu s) = C_{OUT} (\mu F) \times \frac{Vo (V)}{I_{max.}(A)}$$

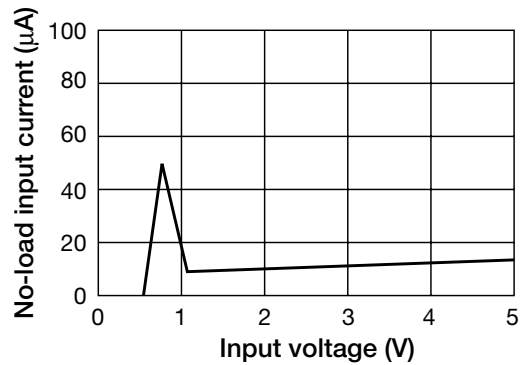
\* Note 1 : Locate the input/output capacitor as close as possible to the IC.

\* Note 2 : When not using output control, short the CE pin to the Vin pin.

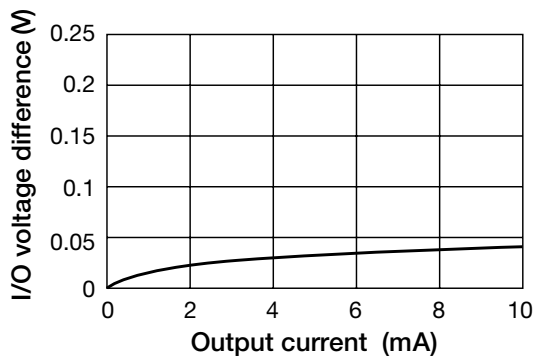
■ Output voltage characteristic ( $I_{OUT}=0mA$ )



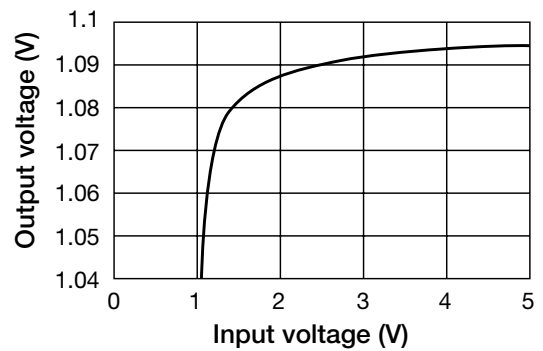
■ No-load input current



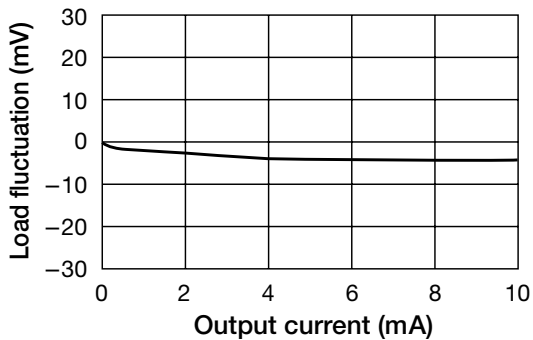
■ I/O voltage difference ( $V_{IN}=1.0V$ )



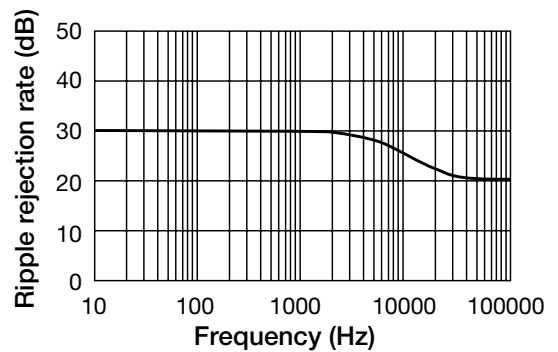
■ Input fluctuation



■ Load fluctuation



■ Ripple rejection rate ( $V_{IN}=1.2V$ )



■ Output VS temperature

