

# MIP504

## Silicon MOS IC

### ■ Features

- 3-pin intelligent power device
- Five protective functions (over-current, over-voltage, short circuit load, over heat, ESD) are integrated
- Acceptable both AC and DC power supply

### ■ Applications

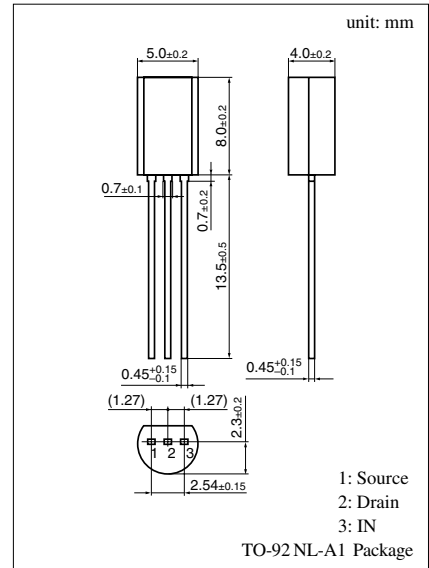
- Lamp drive

### ■ Absolute Maximum Ratings (Ta = 25°C)

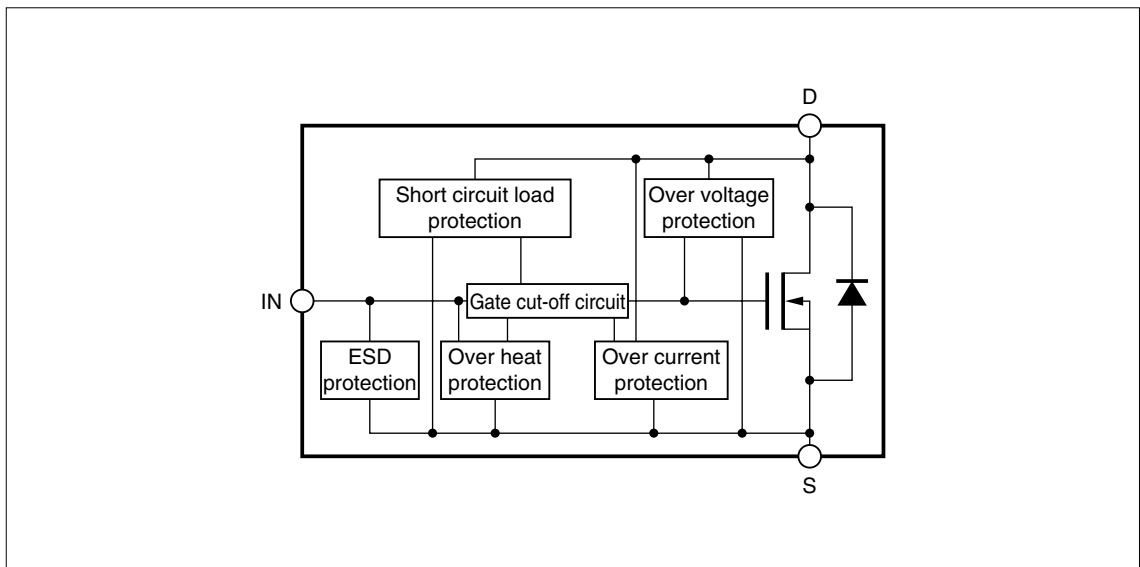
Parameter	Symbol	Rated	Unit
Drain to Source voltage	$V_{DS}$	60	V
Output peak current	$I_{OP}$	$\pm 5$	A
Output current	$I_O$	-1 to 2 <sup>*1</sup>	A
Input voltage	$V_{IN}$	-0.5 to 6	V
Input current	$I_{IN}$	$\pm 10$	mA
Allowable power dissipation	$P_D$	1 <sup>*2</sup>	W
Operating ambient temperature	$T_{opr}$	-40 to +85	°C
Channel temperature	$T_{ch}$	150	°C
Storage temperature	$T_{stg}$	-55 to +150	°C

\*1 Maximum load current, not the average current.

\*2 Mounting on the PCB (Glass epoxy board, the size of 100mm × 100mm). (Ta = 25°C)



### ■ Block Diagram



### ■ Electrical Characteristics ( $T_C = 25 \pm 2^\circ\text{C}$ )

Parameter	Symbol	Conditions	min	typ	max	Unit
Drain to Source ON-resistance	$R_{DS(on)}$	$V_{IN} = 5V, I_{DS} = 1.5A$		0.38	0.5	$\Omega$
Drain to Source ON-voltage	$V_{DS(on)}$	$V_{IN} = 5V, I_{DS} = 1.5A$		0.57	0.75	V
Drain clamp voltage	$V_{DS(CLIP)}$	$V_{IN} = 0, I_{DS} = 3mA$	60	70		V
Drain OFF current (1)	$I_{DS(off)1}$	$V_{IN} = 0, V_{DS} = 12V$		50	80	$\mu\text{A}$
Drain OFF current (2)	$I_{DS(off)2}$	$V_{IN} = 0, V_{DS} = 25V$		0.1	0.16	mA
Drain OFF current (3)	$I_{DS(off)3}$	$V_{IN} = 0, V_{DS} = 40V$		0.16	0.26	mA
Input voltage (High)	$V_{IN(H)}$	$I_{DS} = 1.5A$	4			V
Input voltage (Low)	$V_{IN(L)}$	$I_{DS} = 0.1mA$			0.8	V
Input current	$I_{IN(on)}$	$V_{IN} = 5V, V_{DS} = 0$		0.15	0.5	mA
Over current protection limit	$I_{OCP}$	$V_{IN} = 5V, V_{DS} = 3V$	3.8	5		A
Short circuit load protection limit	$V_{DS(SHT)}$	$V_{IN} = 5V$	3			V

Note: The oscillation of the output current is caused when the drain voltage exceeds the short circuit load detection voltage under the ON state of output.

### ■ Electrical Characteristics ( $T_C = 25 \pm 2^\circ\text{C}$ )

Parameter	Symbol	Conditions	min	typ	max	Unit
Over heat protection temperature	$T_{SHD}$	$V_{IN} = 5V$		140		$^\circ\text{C}$

Note 1: The above values of characteristics are not guaranteed values and are only references for designing.

Note 2: If the chip temperature exceeds the "Over Heat Protection Temperature", output current is shut down.

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