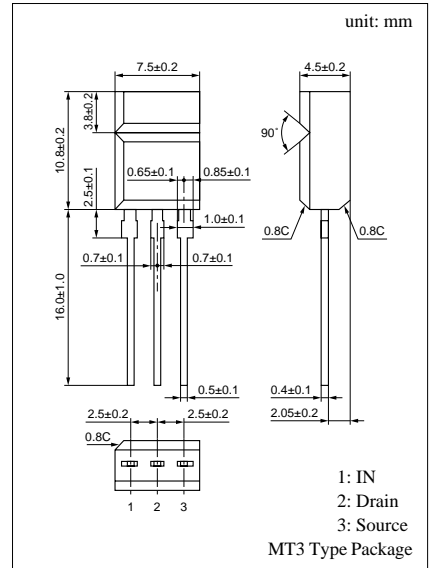**Panasonic**

MIP506

Silicon MOS IC

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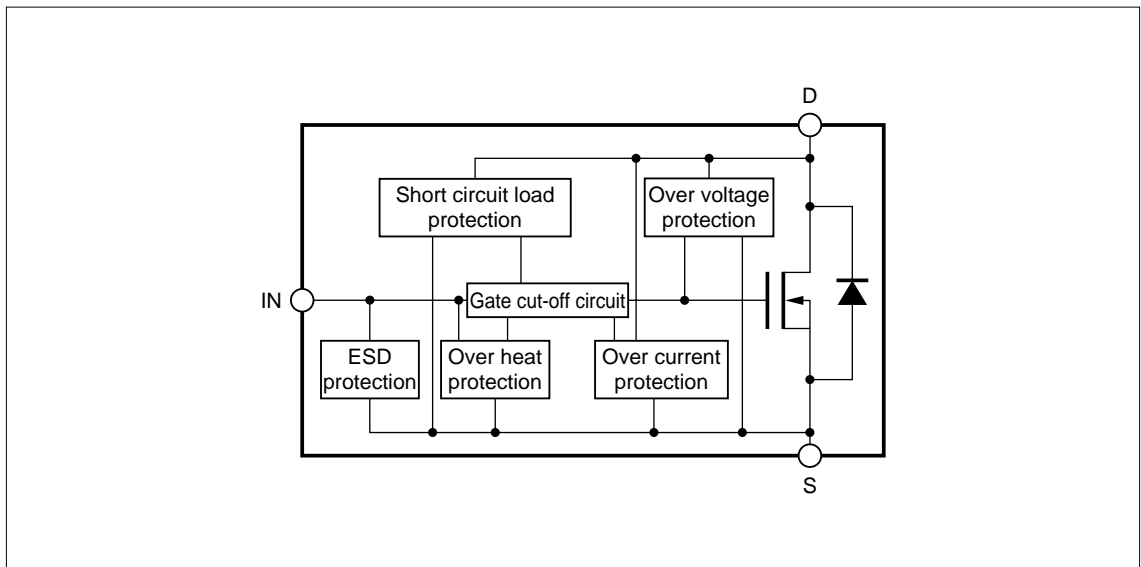- Acceptable both AC and DC power supply

■ Applications
- For lamp and solenoid drive

■ Absolute Maximum Ratings (Ta = 25°C)

Parameter	Symbol	Ratings	Unit
Drain to Source voltage	V_{DS}	45	V
Output peak current	I_{OP}	±7.5	A
Output current	I_O	2	A
Input voltage	V_{IN}	− 0.5 to 6	V
Input current	I_{IN}	±10	mA
Allowable power dissipation	P_D	1.5	W
Operating ambient temperature	T_{opr}	−40 to +85	°C
Channel temperature	T_{ch}	150	°C
Storage temperature	T_{stg}	−55 to +150	°C

unit: mm

1: IN
2: Drain
3: Source
MT3 Type Package

■ Block Diagram

D

Short circuit load protection

Over voltage protection

IN

Gate cut-off circuit

ESD protection

Over heat protection

Over current protection

S

■ Electrical Characteristics ($T_C = 25 \pm 2°C$)

Parameter	Symbol	Conditions	min	typ	max	Unit
Drain to Source ON-resistance	$R_{DS(on)}$	$V_{IN} = 5V$, $I_{DS} = 1.5A$		0.21	0.3	Ω
Drain to Source ON-voltage	$V_{DS(on)}$	$V_{IN} = 5V$, $I_{DS} = 1.5A$		0.32	0.45	V
Drain clamp voltage	$V_{DS(CLP)}$	$V_{IN} = 0$, $I_{DS} = 3mA$	45	55		V
Drain OFF current (1)	$I_{DS(off)1}$	$V_{IN} = 0$, $V_{DS} = 12V$			30	μA
Drain OFF current (2)	$I_{DS(off)2}$	$V_{IN} = 0$, $V_{DS} = 25V$			60	μA
Drain OFF current (3)	$I_{DS(off)3}$	$V_{IN} = 0$, $V_{DS} = 40V$			100	μA
Input voltage (High)	$V_{IN(H)}$	$I_{DS} = 1.5A$	4.5			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}	$V_{IN} = 5V$	4.7	7.5		A
Short circuit load protection limit	$V_{DS(SHT)}$	$V_{IN} = 5V$	2			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 ($T_C = 25 \pm 2°C$)

Parameter	Symbol	Conditions	min	typ	max	Unit
Over heat protection temperature	T_{SHD}	$V_{IN} = 5V$		140		°C
Temperature hysteresis	ΔT	$V_{IN} = 5V$		30		°C

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

Note 2: When the chip surface temperature exceeds the over heat protection temperature, the output current is shut down. After the chip surface temperature is lowered by an equivalent degree of the temperature hysteresis, the circuits restart their operation.

■ Timing Chart