MIP708

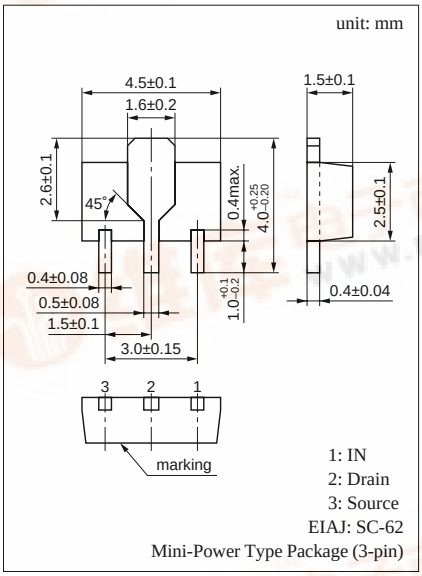
Silicon MOS IC

■ Features

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

■ Applications

- For lamp and solenoid drive



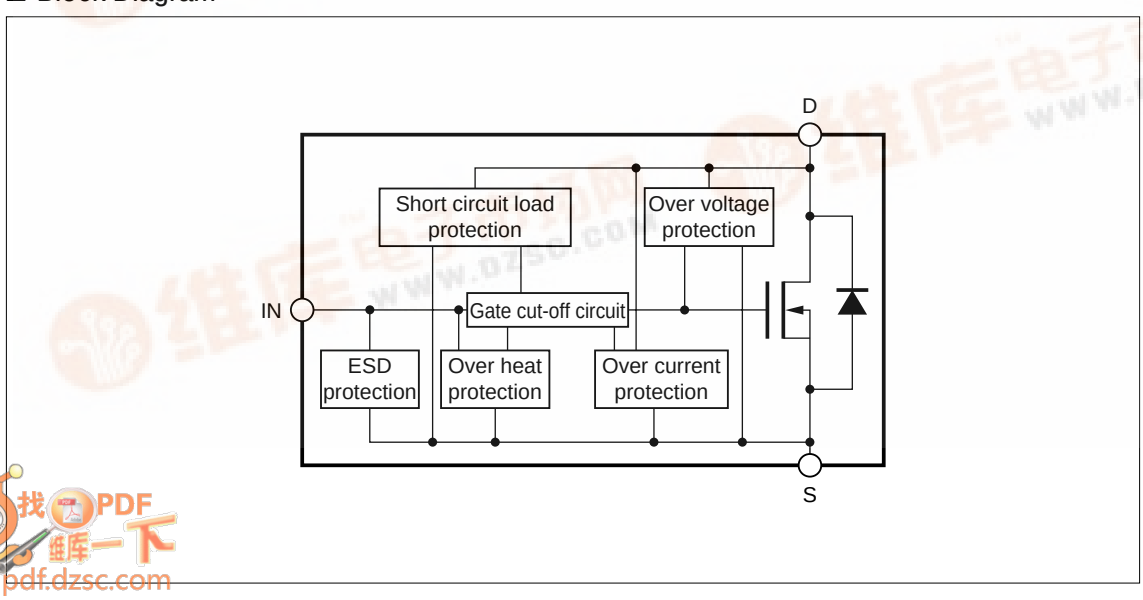
■ Absolute Maximum Ratings (Ta = 25°C)

Parameter		Symbol	Ratings	Unit
Output voltage		V_{DS}	40	V
Output peak current		I_{OP}	±3	A
Output current		I_O	±1	A
Input voltage		V_{IN}	– 0.5 to 6	V
Input current		I_{IN}	±5	mA
Drain clamp energy		E_{CLP}	24*1	mJ
Allowable power dissipation	Ta = 25°C	P_{D1}	1*2	W
	T_C = 25°C	P_{D2}	2	W
Operating ambient temperature		T_{opr}	–40 to +125	°C
Channel temperature		T_{ch}	150	°C
Storage temperature		T_{stg}	–55 to +150	°C

*1 L = 10mH, I_L = 2.19A, V_{DD} = 20V, 1pulse, T_C = 25°C

*2 Mounting on the PCB (the copper foil of the drain portion has a area of 100mm² or more and the thickness of glass epoxy board is 1.7mm.)

■ Block Diagram



■ Electrical Characteristics (T_C = 25 ± 3°C)

Parameter	Symbol	Conditions	min	typ	max	Unit
Drain to Source ON-resistance	$R_{DS(on)}$	V_{IN} = 5V, I_{DS} = 1A		0.5	0.8	Ω
Drain to Source ON-voltage	$V_{DS(on)}$	V_{IN} = 5V, I_{DS} = 1A		0.5	0.8	V
Drain clamp voltage	$V_{DS(CLP)}$	V_{IN} = 0, I_{DS} = 3mA	40	49		V
Drain OFF current (1)	$I_{DS(off)1}$	V_{IN} = 0, V_{DS} = 12V		50	100	µA
Drain OFF current (2)	$I_{DS(off)2}$	V_{IN} = 0, V_{DS} = 16V		70	140	mA
Input voltage (High)	$V_{IN(H)}$	I_{DS} = 1A	4			V
Input voltage (Low)	$V_{IN(L)}$	I_{DS} = 1mA			0.8	V
Input current	$I_{IN(on)}$	V_{IN} = 5V, V_{DS} = 0		0.15	1	mA
Over current protection limit	I_{OCP}	V_{IN} = 5V	2	3		A
Short circuit load protection limit	$V_{DS(SHT)}$	V_{IN} = 5V	2	4		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 ± 2°C)

Parameter	Symbol	Conditions	min	typ	max	Unit
Over heat protection temperature	T_{SHD}	V_{IN} = 5V	160	190		°C
Turn on delay time	$t_{d(on)}$	V_{IN} = 5V, I_{DS} = 1A V_{DD} = 12V, R_L = 12Ω		1		µs
Turn-on time	t_{on}			5.5		µs
Turn off delay time	$t_{d(off)}$			3.4		µs
Turn-off time	t_{off}			7.2		µs

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.

■ Timing Chart