



TND002

## Intelligent Power Device for Use in Lamp Driver and Low-side Power Switch Applications

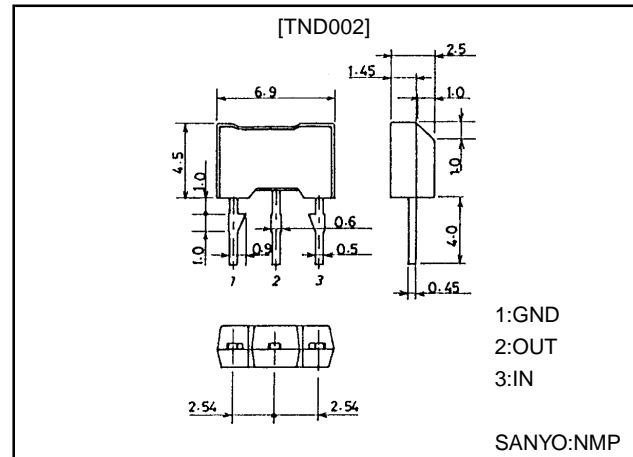
### Features

- Monolithic N-channel MOSFET built in.
- Overcurrent protection built in.
- Overvoltage protection built in.
- Reset function built in.

### Package Dimensions

unit:mm

2135



### Specifications

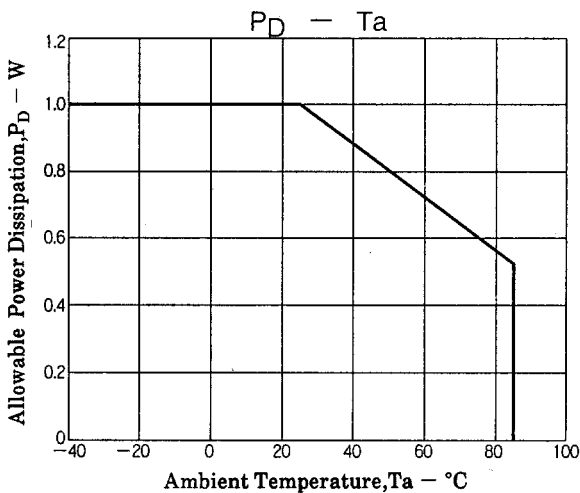
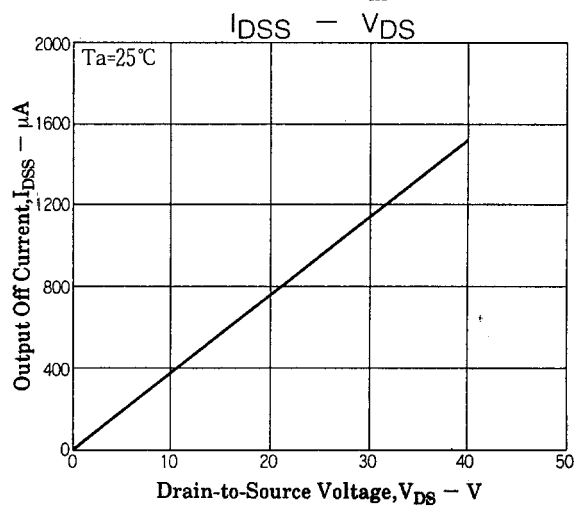
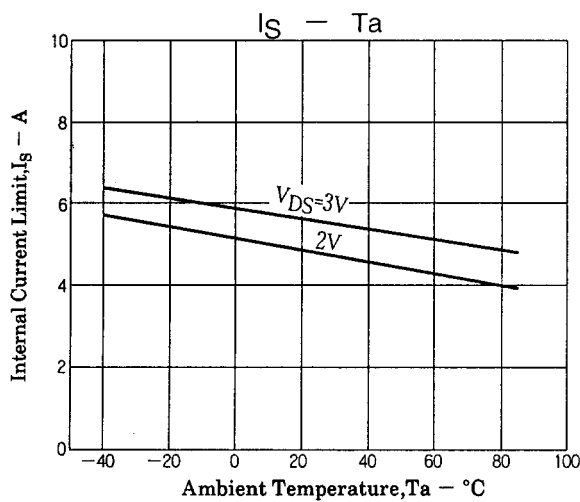
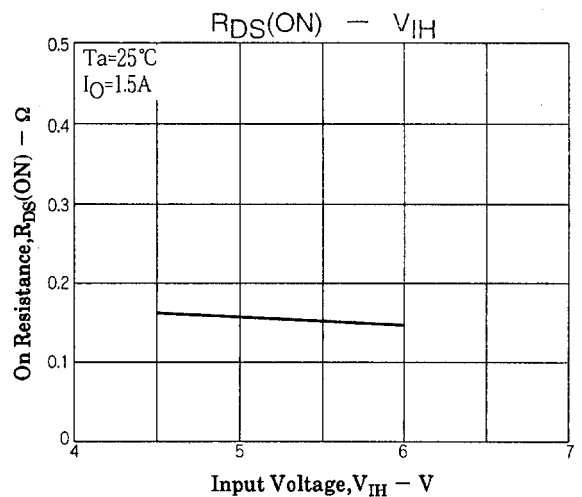
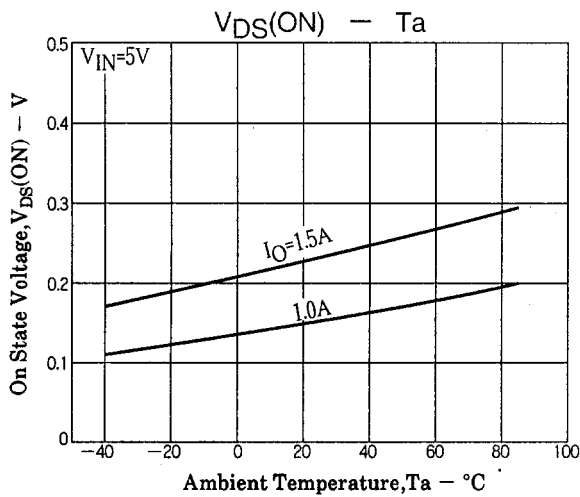
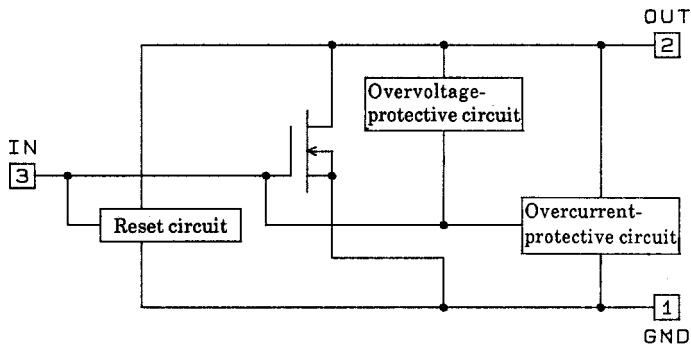
#### Absolute Maximum Ratings at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	$V_{DS(DC)}$		40	V
Output Current	$I_O(DC)$		1.5	A
Peak Output Current	$I_{OP}$		5	A
Input Voltage	$V_{IN}$		-0.5 to +6	V
Input Current	$I_{IN}$		±10	mA
Allowable Power Dissipation	$P_D$		1	W
Operating Temperature	$T_{opr}$		-40 to +85	°C
Junction Temperature	$T_j$		150	°C
Storage Temperature	$T_{stg}$		-55 to +150	°C

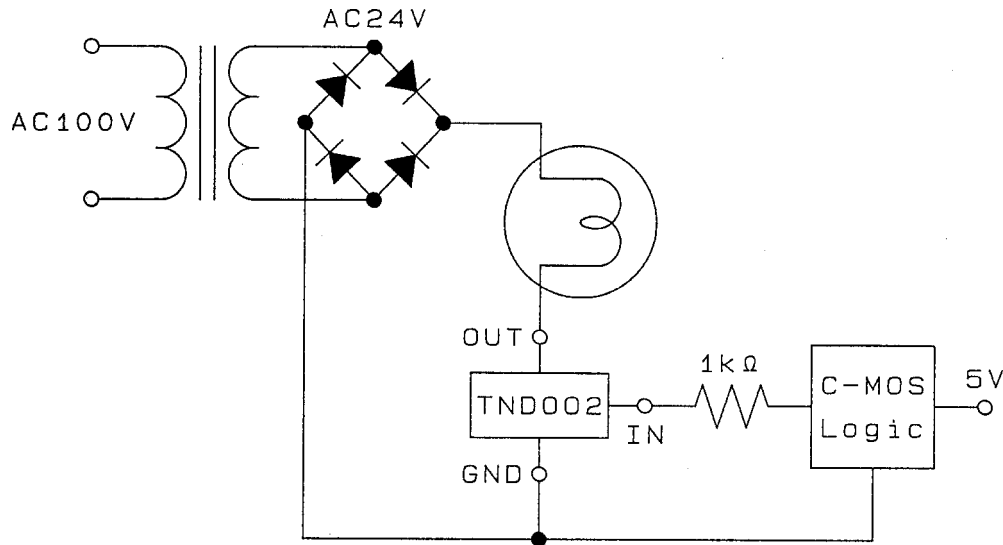
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Drain-to-Source Breakdown Voltage	$V_{DSS}$	$V_{IN}=0, I_O=3mA$	40			V
Output Off Current (1)	$I_{DSS1}$	$V_{IN}=0, V_{DS}=40V$			3	mA
Output Off Current (2)	$I_{DSS2}$	$V_{IN}=0, V_{DS}=25V$			1.5	mA
Input Voltage	$V_{IH}$	$V_{DD}=24V(AC), I_O=1.5A$	4.5	5	6	V
Input Voltage	$V_{IL}$	$V_{DD}=24V(AC), I_O=5mA$			0.8	V
On Voltage	$V_{DS(ON)}$	$V_{IN}=5V, I_O=1.5A$		0.5	0.75	V
On Resistance	$R_{DS(ON)}$	$V_{IN}=5V, I_O=1.5A$			0.5	Ω
Internal Current Limit	$I_S$	$V_{IN}=5V$		5		A
Input Current	$I_{IN}$	$V_{IN}=5V, V_{DS(ON)} \leq 1V$			1	mA
Protection Reset Voltage *	$V_{RESET}$	$V_{IN}=5V$		4.6		V

\* : Output is turned off regardless of input when power supply voltage is higher than  $V_{RESET}$ .

Circuit



## Sample Applications Circuit



## Operation

- When the input voltage exceeds 4.5V, the output power MOSFET is turned on to cause current to flow through the lamp and turn it on. At this time, if a rush current flows through the lamp, the current will be limited to about 5A by the built-in overcurrent protection circuit. When the input voltage drops below 0.8V, the output power MOSFET is turned off and the lamp is turned off.
- When the lamp load is short-circuited, output voltage becomes equal to the power supply voltage. Therefore, the reset circuit operates to turn off the output power MOSFET, protecting the power switch from destruction.

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