**IS725**

# HIGH VOLTAGE DARLINGTON OUTPUT OPTICALLY COUPLED ISOLATOR

## APPROVALS

- UL recognised, File No. E91231

## DESCRIPTION

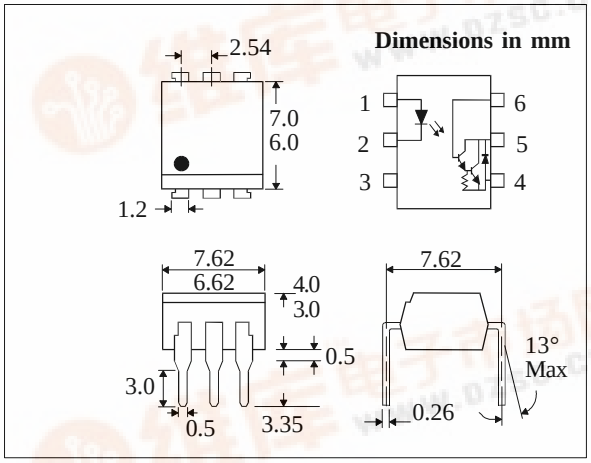
The IS725 is an optically coupled isolator consisting of infrared light emitting diode and a high voltage NPN silicon photo darlington which has an integral base-emitter resistor to optimise switching speed and elevated temperature characteristics in a standard 6pin dual in line plastic package.

## FEATURES

- Options :-
  10mm lead spread - add G after part no.
  Surface mount - add SM after part no.
  Tape&reel - add SMT&R after part no.
- High Isolation Voltage ($5.3kV_{RMS}$ ,$7.5kV_{PK}$ )
- High Current Transfer Ratio ( 1000% min)
- High $BV_{CEO}$ (300V min.)
- Low collector dark current :-
  1µA max. at 200V $V_{CE}$
- Low input current 1mA $I_F$

## APPLICATIONS

- Modems
- Copiers, facsimiles
- Numerical control machines
- Signal transmission between systems of different potentials and impedances




## ABSOLUTE MAXIMUM RATINGS (25°C unless otherwise specified)

| | |
|---|---|
| Storage Temperature | -55°C to + 150°C |
| Operating Temperature | -55°C to + 100°C |
| Lead Soldering Temperature (1/16 inch (1.6mm) from case for 10 secs) | 260°C |

## INPUT DIODE

| | |
|---|---|
| Forward Current | 50mA |
| Reverse Voltage | 6V |
| Power Dissipation | 70mW |

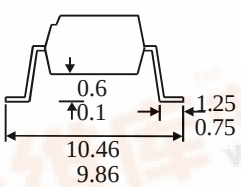
## OUTPUT TRANSISTOR

| | |
|---|---|
| Collector-emitter Voltage $BV_{CEO}$ | 300V |
| Collector-base Voltage $BV_{CBO}$ | 300V |
| Emitter-baseVoltage $BV_{ECO}$ | 6V |
| Collector Current $I_C$ | 150mA |
| Power Dissipation | 300mW |

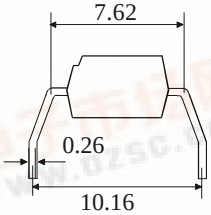
## POWER DISSIPATION

| | |
|---|---|
| Total Power Dissipation | 350mW |

**OPTION SM**
**SURFACE MOUNT**




**OPTION G**

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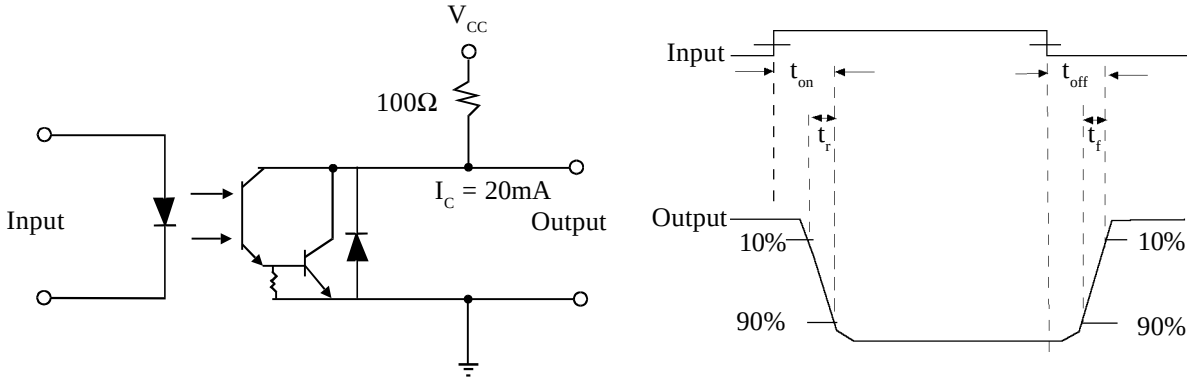
**ELECTRICAL CHARACTERISTICS ( $T_A$= 25°C Unless otherwise noted )**

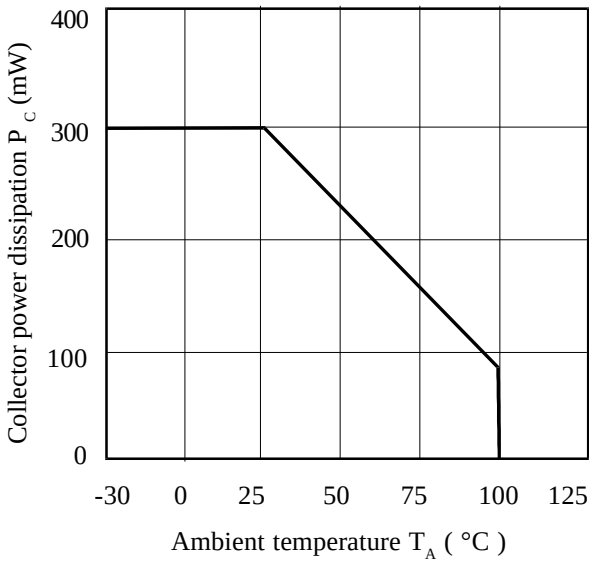
| PARAMETER | | MIN | TYP | MAX | UNITS | TEST CONDITION |
|---|---|---|---|---|---|---|
| Input | Forward Voltage ($V_F$) | | 1.2 | 1.4 | V | $I_F$ = 10mA |
| | Reverse Voltage ($V_R$) | 6 | | | V | $I_R$ = 10µA |
| | Reverse Current ($I_R$) | | | 10 | µA | $V_R$ = 6V |
| Output | Collector-emitter Breakdown ($BV_{CEO}$) | 300 | | | V | $I_C$ = 1mA |
| | Collector-base Breakdown ($BV_{CBO}$) | 300 | | | V | $I_C$ = 0.1mA |
| | Emitter-base Breakdown ($BV_{EBO}$) | 6 | | | V | $I_E$ = 0.1mA |
| | Collector-emitter Dark Current ($I_{CEO}$) | | | 1 | µA | $V_{CE}$ = 200V |
| Coupled | Current Transfer Ratio (CTR) | 1000 | 4000 | | % | 1mA $I_F$, 2V $V_{CE}$ |
| | Collector-emitter Saturation Voltage $V_{CE(SAT)}$ | | | 1.2 | V | 20mA $I_F$, 100mA $I_C$ |
| | Input to Output Isolation Voltage $V_{ISO}$ | 5300 | | | $V_{RMS}$ | See note 1 |
| | | 7500 | | | $V_{PK}$ | See note 1 |
| | Input-output Isolation Resistance $R_{ISO}$ | $5x10^{10}$ | | | Ω | $V_{IO}$ = 500V (note 1) |
| | Input-output Capacitance Cf | | | 1 | pF | V = 0, f =1MHz |
| | Cut-off frequency fc | 1 | | | kHz | $V_{CE}$ = 2V, $I_C$= 20mA, $R_L$ = 100Ω, $R_{BE}$= open |
| | Output Rise Time tr | | | 300 | µs | $V_{CE}$ = 2V, $I_C$= 20mA, |
| | Output Fall Time tf | | | 100 | µs | $R_L$ = 100Ω, $R_{BE}$= open |

Note 1 Measured with input leads shorted together and output leads shorted together.
Note 2 Special Selections are available on request. Please consult the factory.

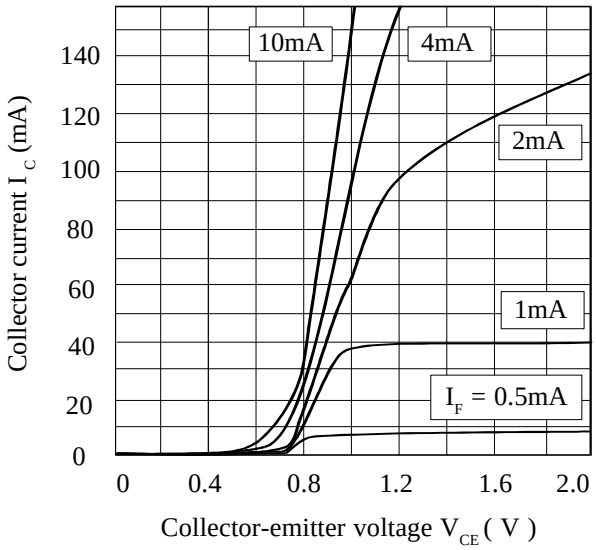
**FIGURE 1**



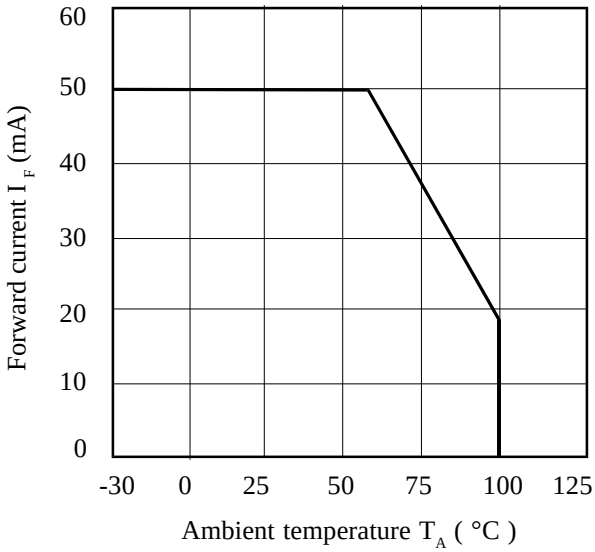
**Collector Power Dissipation vs. Ambient Temperature**



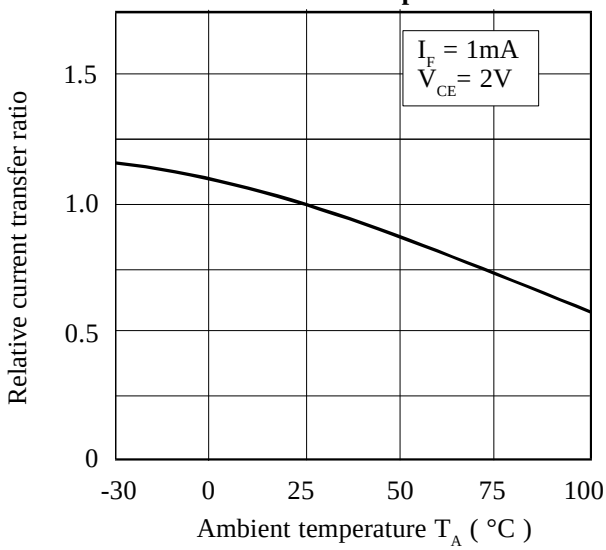

**Collector Current vs. Collector-emitter Voltage**



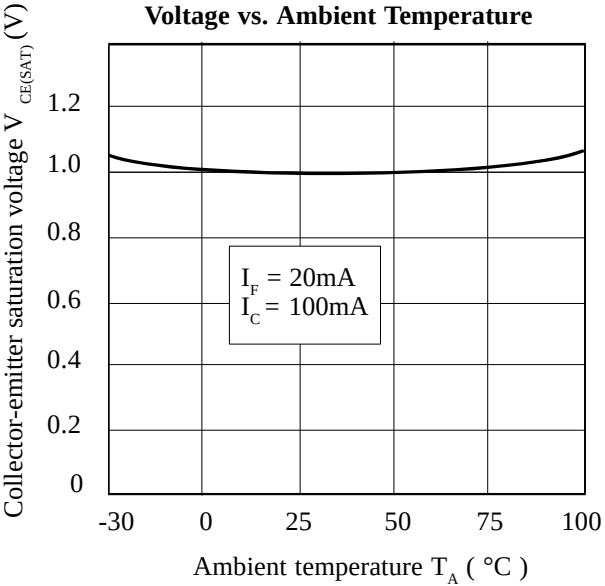

**Forward Current vs. Ambient Temperature**




**Relative Current Transfer Ratio vs. Ambient Temperature**




**Collector-emitter Saturation Voltage vs. Ambient Temperature**




**Collector Dark Current vs. Ambient Temperature**