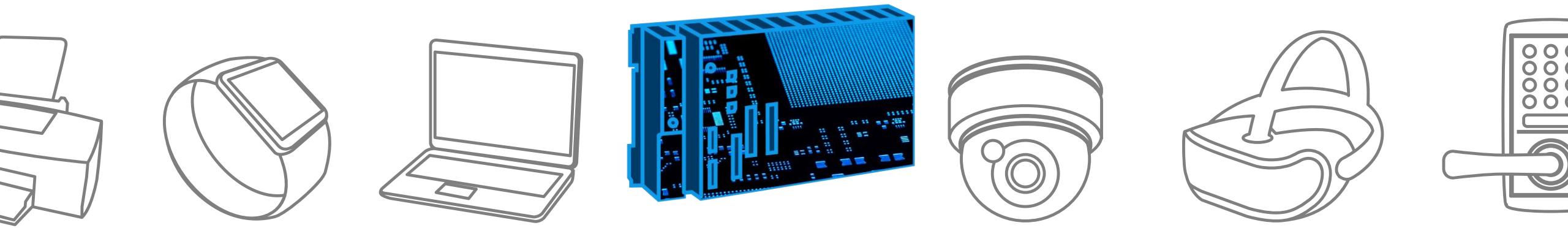
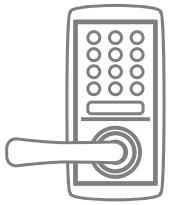
TOSHIBA

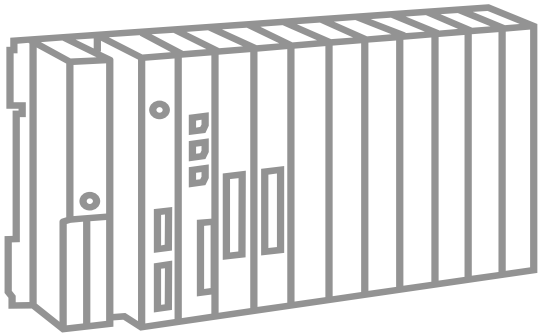
R21

Programmable Logic Controller

Solution Proposal by Toshiba

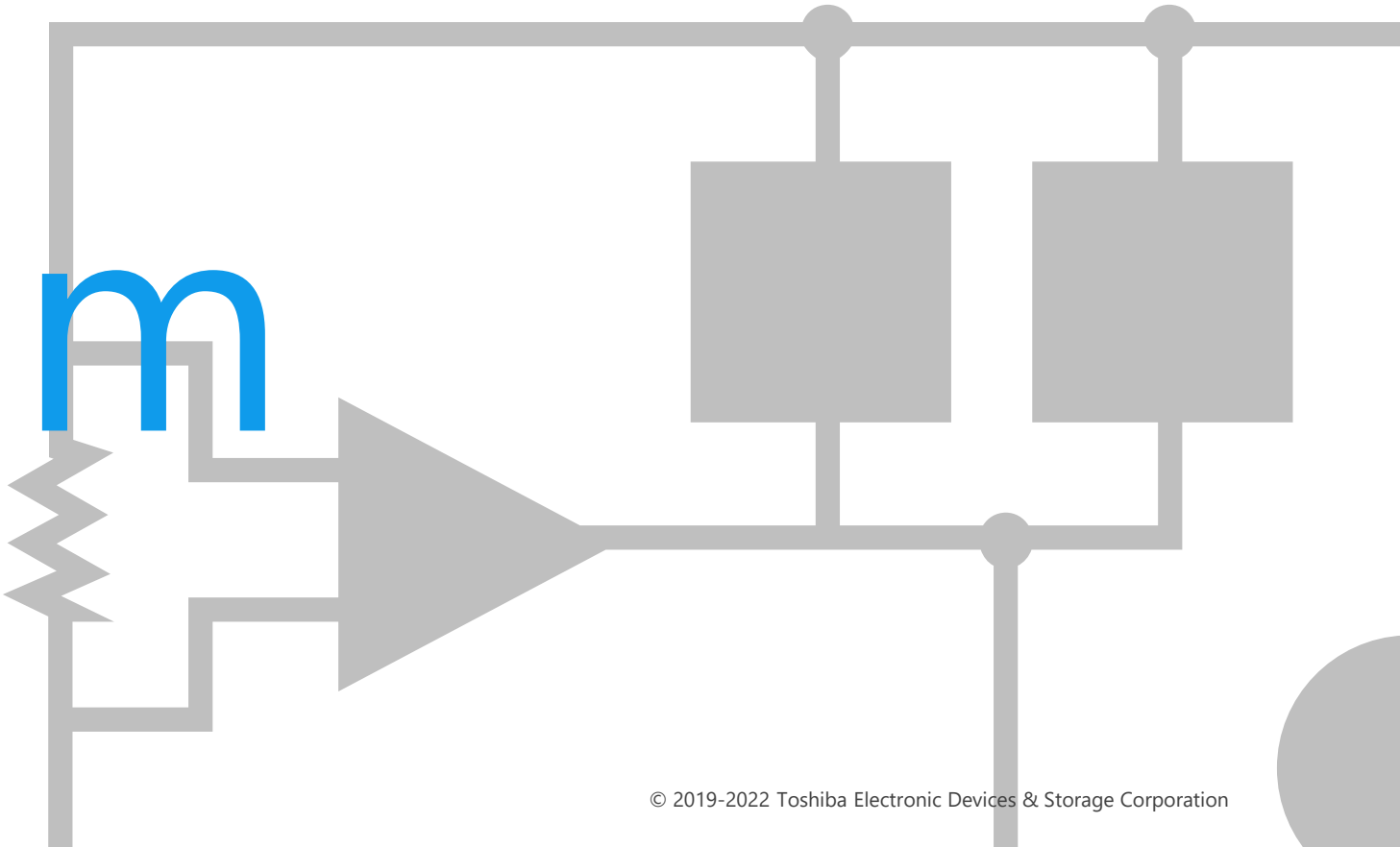




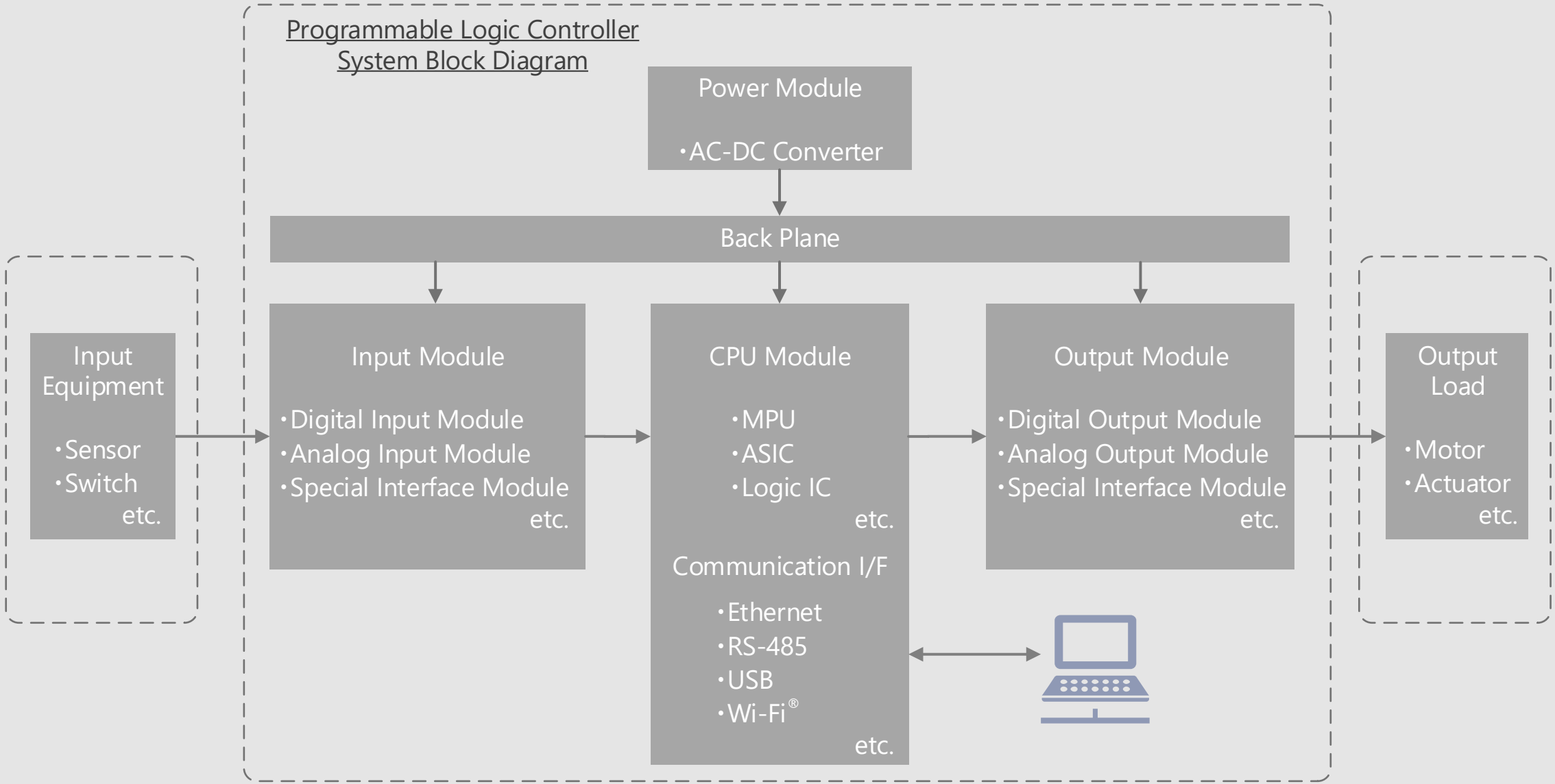


Toshiba Electronic Devices & Storage Corporation provides comprehensive device solutions to customers developing new products by applying its thorough understanding of the systems acquired through the analysis of basic product designs.

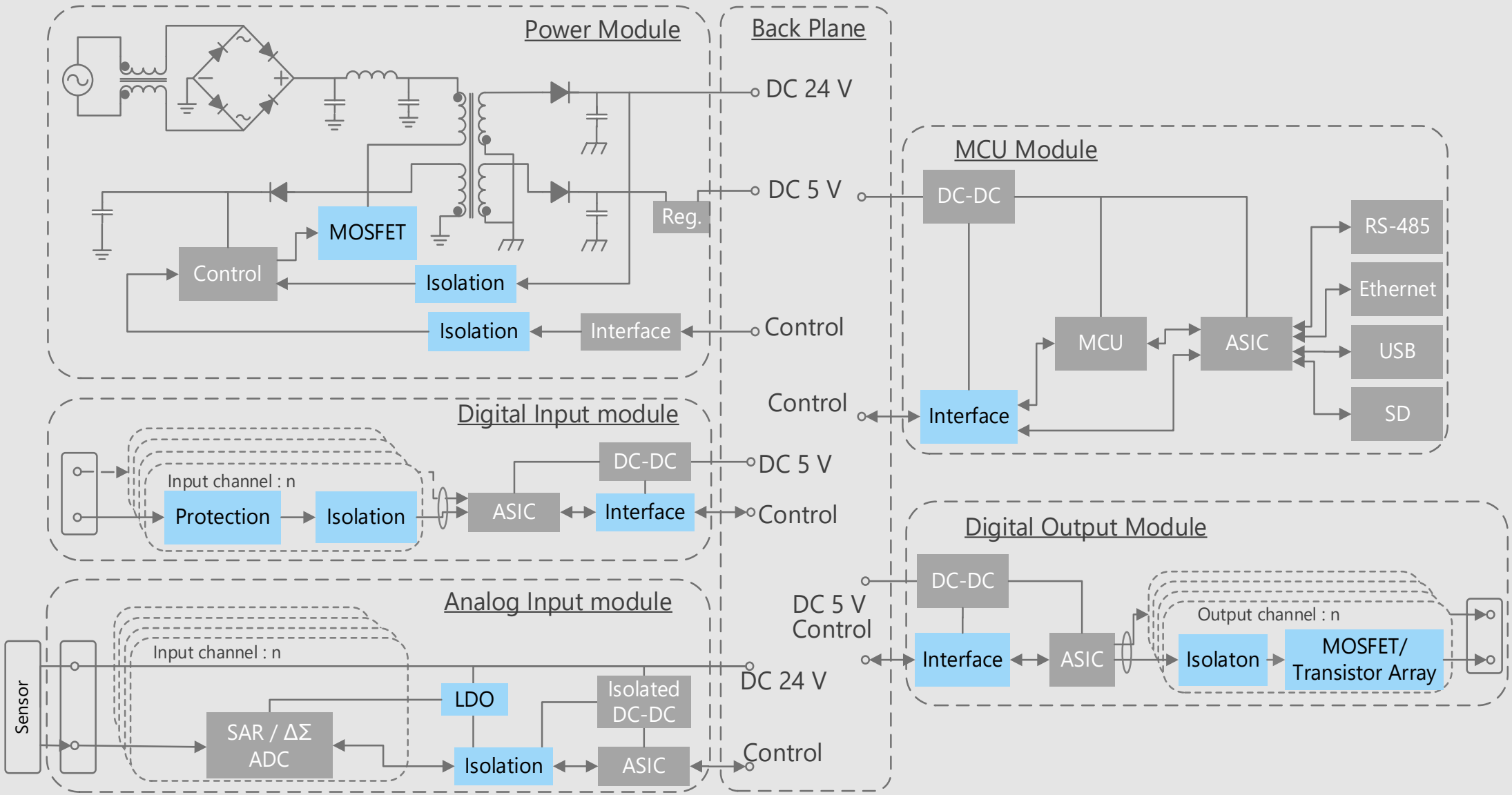
Block Diagram



Programmable Logic Controller　Overall System

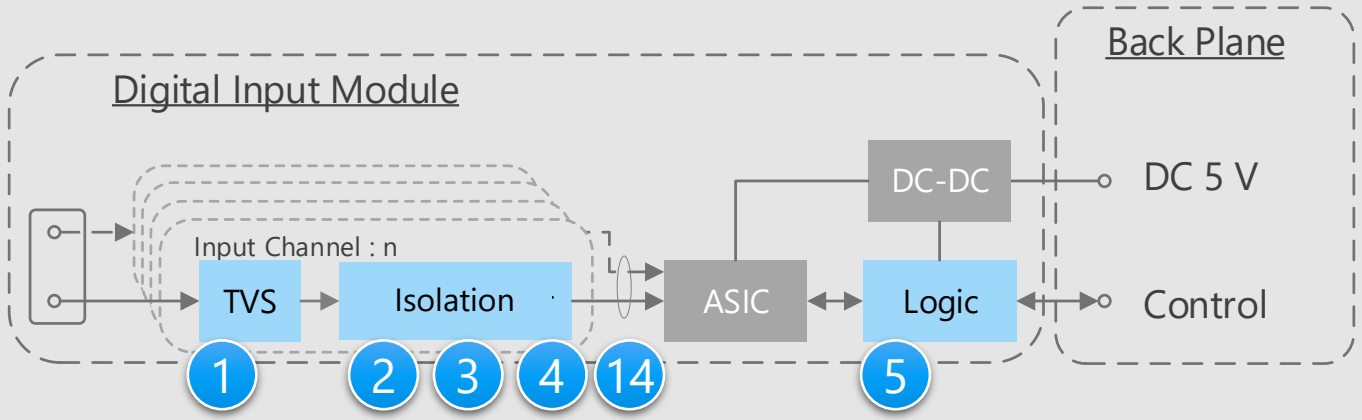


Programmable Logic Controller　Overall block diagram



Programmable Logic Controller　Detail of digital input module section

Digital input module circuit



* Click on the numbers in the circuit diagram to jump to the detailed descriptions page

Criteria for device selection

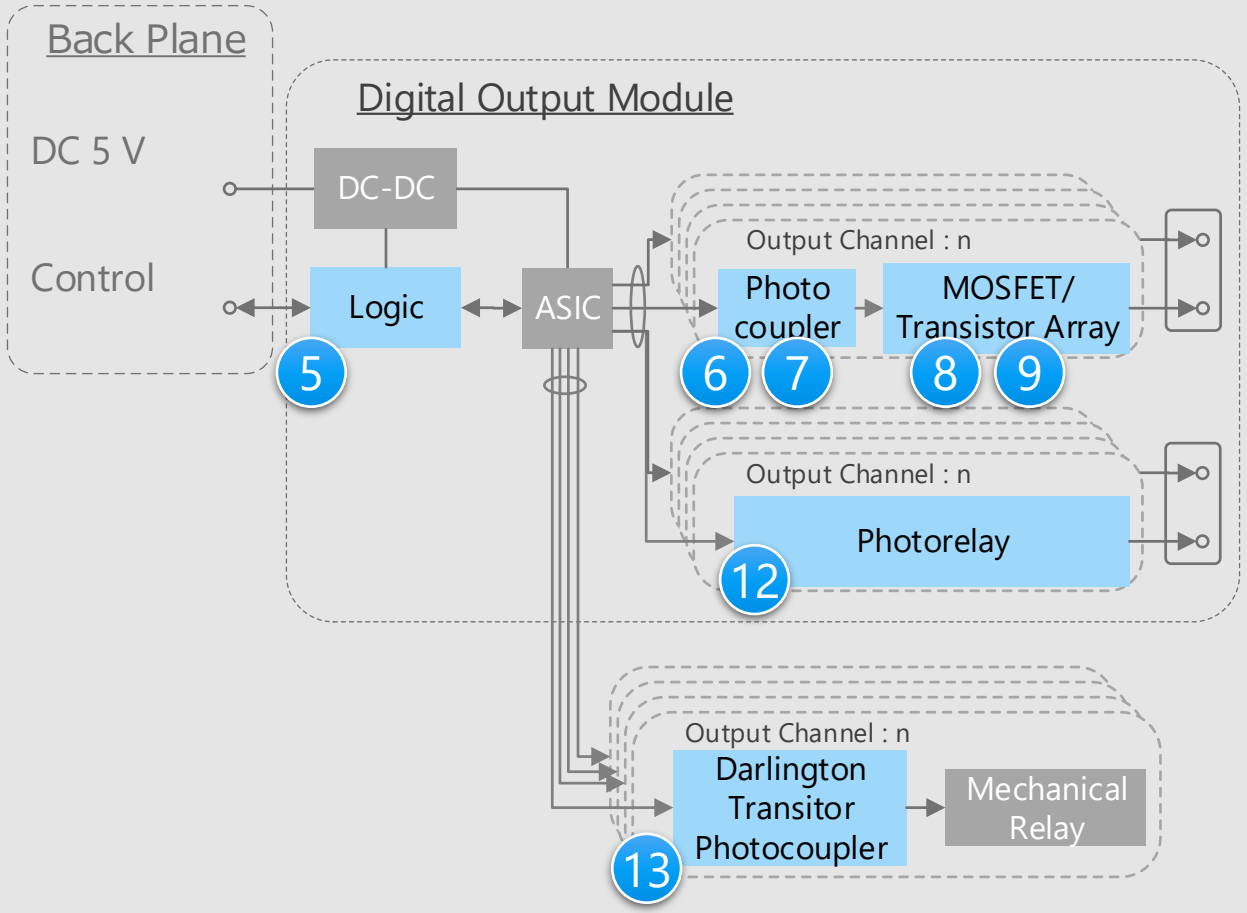
- TVS diode is suitable for ESD protection of signal input line.
- Photocoupler or digital isolator is suitable for isolation between signal input line and ASIC.

Proposal from Toshiba

- **Prevent circuit malfunctions by absorbing electrostatic discharge (ESD) from external terminals**
  TVS diode (1)
- **Realize high gain and isolated high speed signal transmission**
  Transistor output photocoupler (AC input) (2)
  IC output photocoupler for high speed communication (AC input) (3)
  IC output photocoupler for high speed communication (supports IEC 61131-2) (4)
  Standard digital isolator (14)
- **Low voltage operation and small/thin package**
  One-gate logic IC (5)

Programmable Logic Controller　Detail of digital output module section

Digital output module circuit



* Click on the numbers in the circuit diagram to jump to the detailed descriptions page

Criteria for device selection

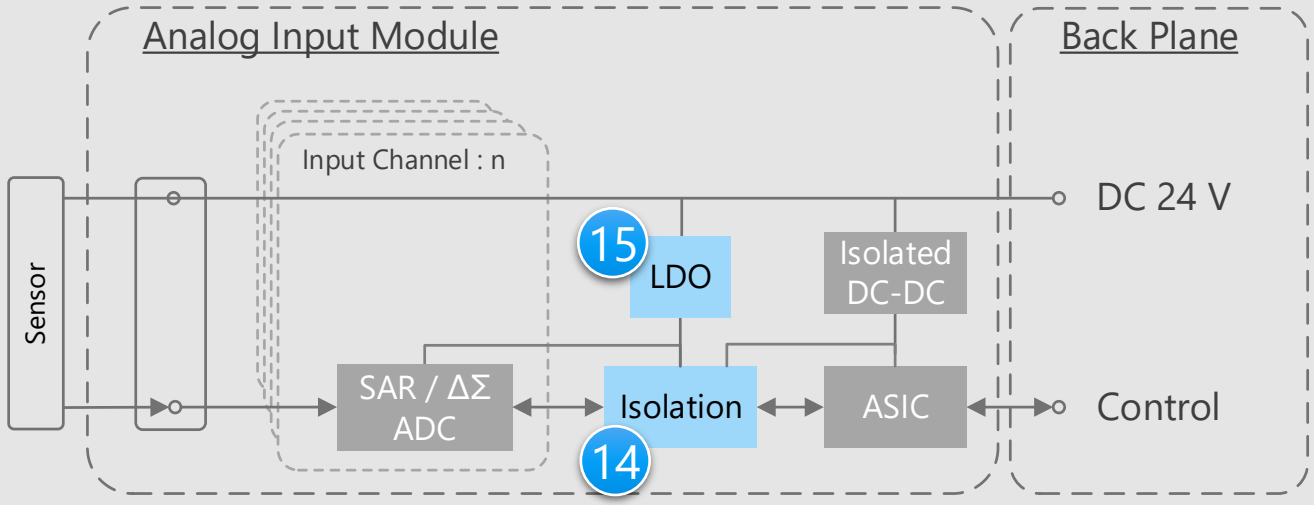
- Photocoupler or digital isolator is suitable for isolation between signal input line and ASIC.

Proposal from Toshiba

- **Low voltage operation and small/thin package**
  One-gate logic IC 5
- **Realize high gain and isolated high speed signal transmission**
  Transistor output photocoupler (DC input) 6
  IC output photocoupler
  for high speed communication (DC input) 7
  Darlington transistor output photocoupler 13
- **Realize the set with low power consumption by low on-resistance**
  Small signal MOSFET 8
- **High voltage and high current by DMOS FET output**
  Transistor array 9
- **High output current and low on-resistance**
  Photorelay 12

Programmable Logic Controller　Detail of analog input module section

Analog input module circuit (single channel)



* Click on the numbers in the circuit diagram to jump to the detailed descriptions page

Criteria for device selection

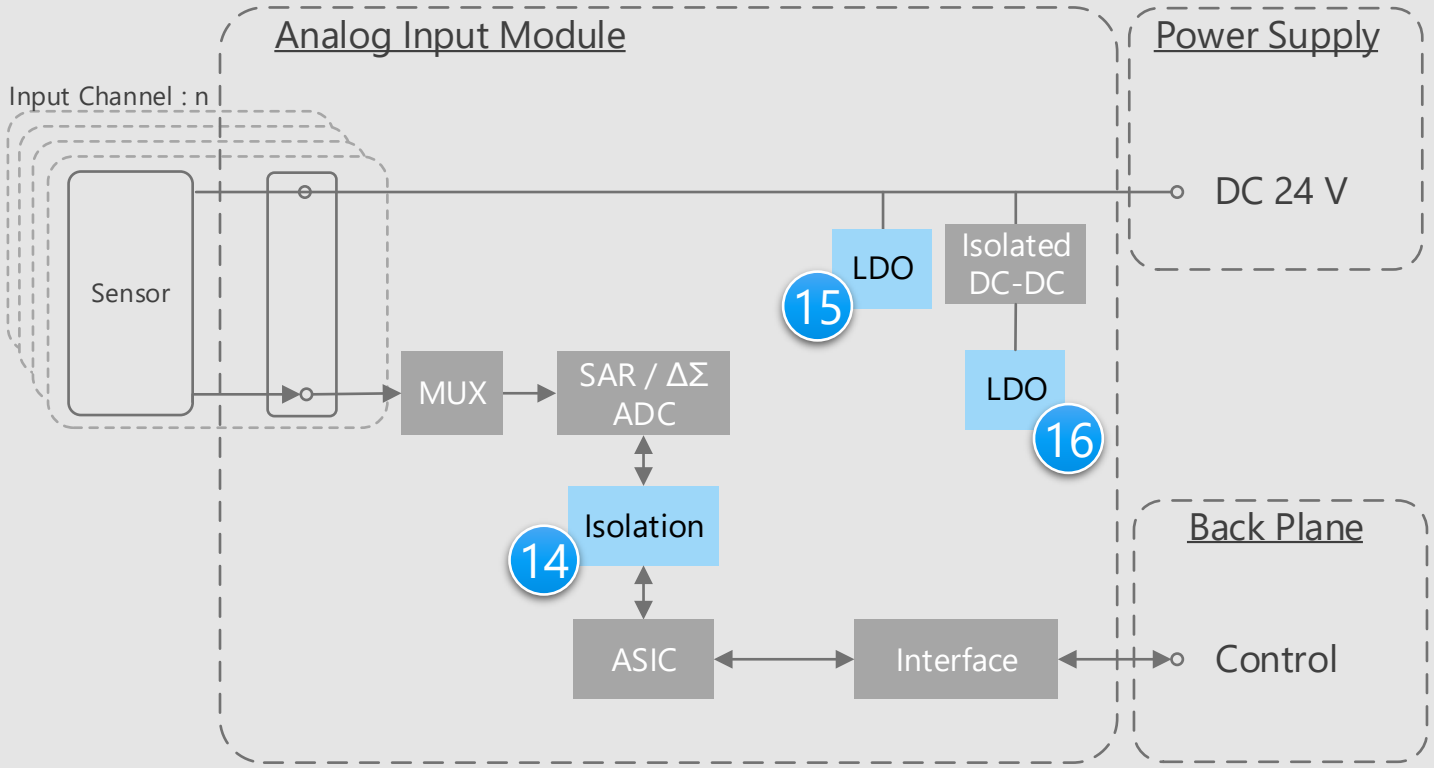
- Digital isolator is suitable for isolated high speed clock signal transmission necessary to operate SAR type AD converter.
- Digital isolator is suitable for isolation between signal input line and ASIC.

Proposal from Toshiba

- **Isolation device suitable for high speed clock input**
  Standard digital isolator 14
- **Contribute to low power consumption in standby operation**
  High voltage CMOS linear regulator 15

Programmable Logic Controller　Detail of analog input module section

Analog input module circuit (multiple channels)



* Click on the numbers in the circuit diagram to jump to the detailed descriptions page

Criteria for device selection

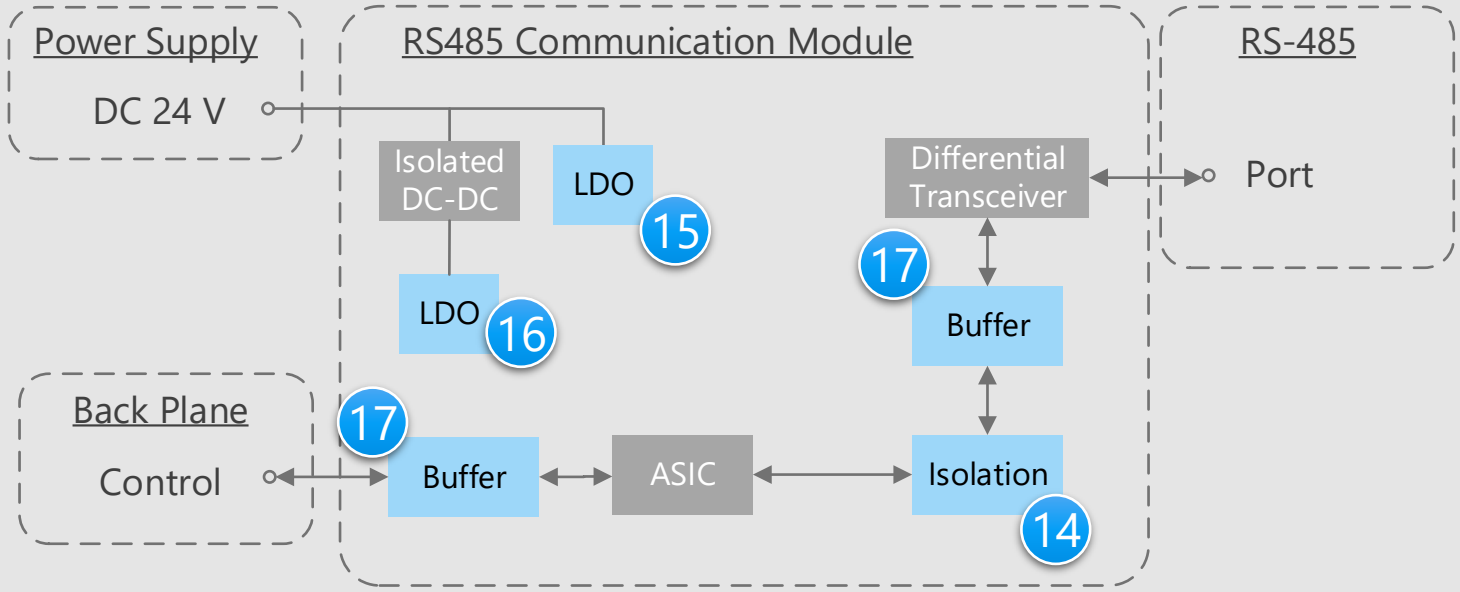
- Digital isolator is suitable for isolated high speed clock signal transmission necessary to operate SAR type AD converter.

Proposal from Toshiba

- **Isolation device suitable for high speed clock input**
  Standard digital isolator 14
- **Contribute to low power consumption in standby operation**
  High voltage CMOS linear regulator 15
- **Supply the power with low noise**
  Small surface mount LDO regulator 16

Programmable Logic Controller　Detail of MCU module section

MCU module (RS-485 communication) circuit



* Click on the numbers in the circuit diagram to jump to the detailed descriptions page

Criteria for device selection

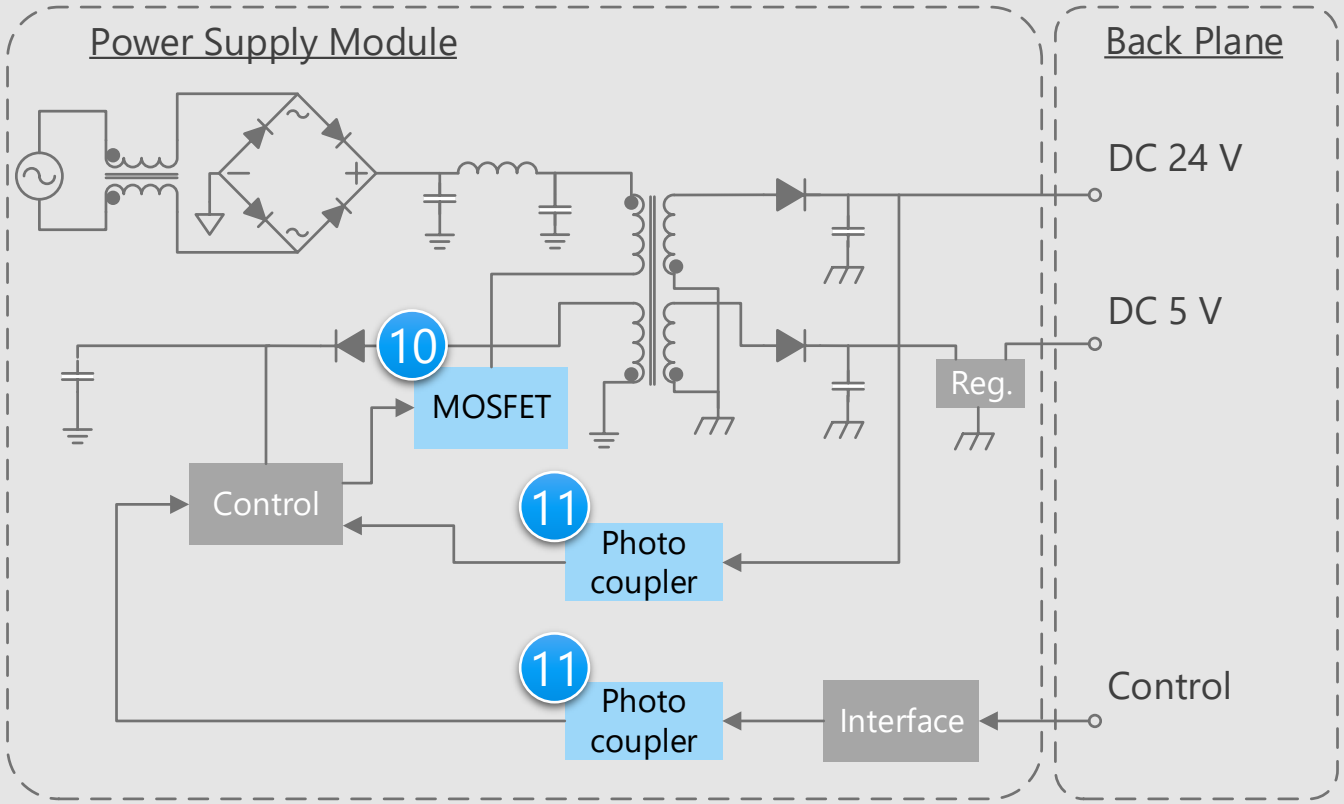
- Digital isolator is suitable for isolated high speed clock signal transmission necessary to operate SAR type AD converter.

Proposal from Toshiba

- **Isolation device suitable for high speed clock input**
  Standard digital isolator 14
- **Contribute to low power consumption in standby operation**
  High voltage CMOS linear regulator 15
- **Supply the power with low noise**
  Small surface mount LDO regulator 16
- **Low voltage operation and small/thin package**
  CMOS logic IC 17

Programmable Logic Controller　Detail of power supply module section

Power supply module circuit



* Click on the numbers in the circuit diagram to jump to the detailed descriptions page

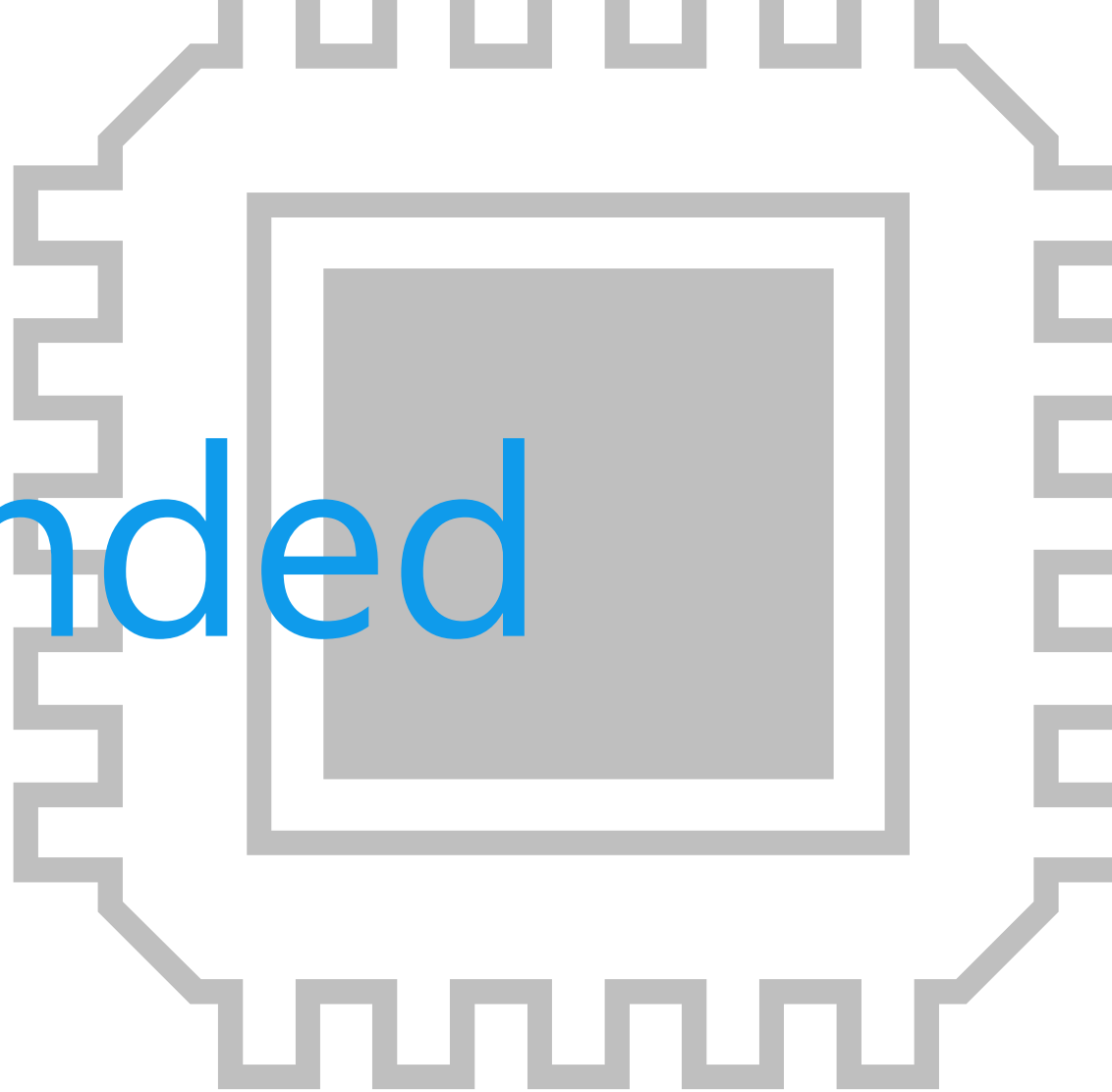
Criteria for device selection

- A low switching loss MOSFET is suitable for improving the efficiency of AC-DC power supply.
- Photocoupler is suitable for isolated signal transmission between primary and secondary sides of AC-DC power supply.

Proposal from Toshiba

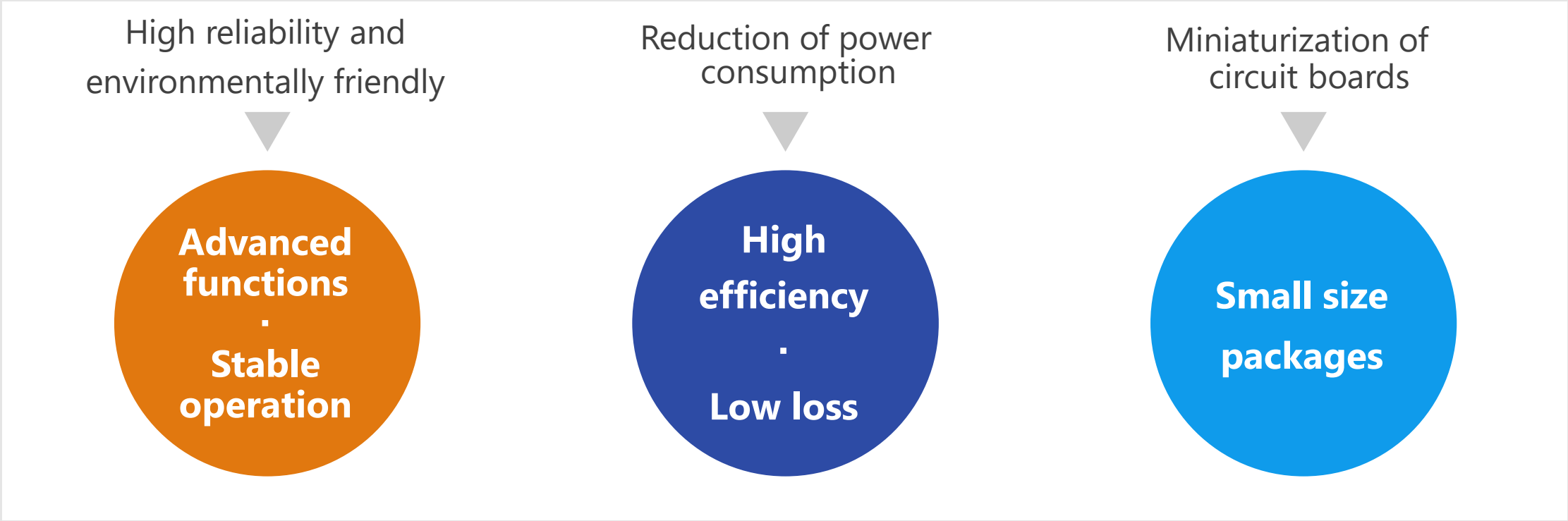
- **Low on-resistance contributes to realize low power consumption of the set**
  π-MOSⅧ Series MOSFET 10
- **High isolation voltage**
  Transistor output photocoupler (DC input) 11

Recommended Devices



Device solutions to address customer needs

As described above, in the design of Programmable Logic Controller, **“High reliability and environmentally friendly“**, **“Reduction of power consumption”** and **“Miniaturization of circuit boards”** are important factors. Toshiba’s proposals are based on these three solution perspectives.



Device solutions to address customer needs

	Advanced functions · Stable operation	High efficiency · Low loss	Small size packages
1 TVS diode	●	●	●
2 Transistor output photocoupler (AC input)	●	●	●
3 IC output photocoupler for high speed communication (AC input)	●	●	●
4 IC output photocoupler for high speed communication (supports IEC 61131-2)	●	●	●
5 One-gate logic IC		●	●
6 Transistor output photocoupler (DC input)	●	●	●
7 IC output photocoupler for high speed communication (DC input)	●	●	●
8 Small signal MOSFET		●	●
9 Transistor array	●	●	●
10 π-MOSⅧ Series MOSFET		●	●

Device solutions to address customer needs

	Advanced functions · Stable operation	High efficiency · Low loss	Small size packages
11 Transistor output photocoupler (DC input)	●	●	●
12 Photorelay	●	●	●
13 Darlington transistor output photocoupler	●	●	●
14 Standard digital isolator	●	●	●
15 High voltage CMOS linear regulator	●	●	●
16 Small surface mount LDO regulator	●	●	●
17 CMOS logic IC		●	●

1 TVS diode

DF2B7BSL / DF2B7AFS / DF2B7ACT / DF2B7AE / DF2B7AFU

Advanced functions · Stable operation

High efficiency · Low loss

Small size packages

Value provided

Absorbs static electricity (ESD) from external terminals, prevents circuit malfunction and protects devices.

1 High ESD pulse absorption performance

Improved ESD absorption compared to our conventional products. (50 % reduction in operating resistance) For some products, both low operating resistance and low capacitance are realized and ensures high signal protection performance and signal quality.

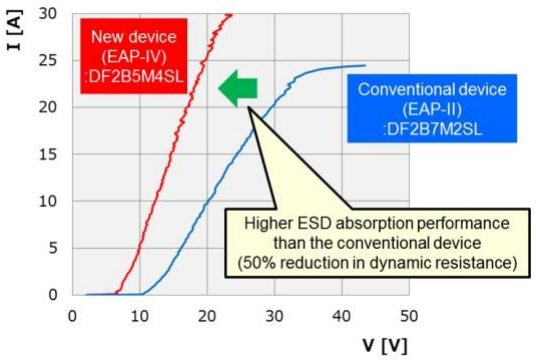
2 Suppress ESD energy by means of low clamp voltage

Protect the connected circuits/devices using Toshiba own technology.

3 Suitable for high density mounting

A variety of small packages are available.

ESD Pulse Absorption Performance (Toshiba internal comparison)



Lineup

Part number	DF2B7BSL	DF2B7AFS	DF2B7ACT	DF2B7AE	DF2B7AFU
Package	SL2	SOD-923	CST2	ESC	USC
V_{RWM} (Max) [V]	5.5	5.5	5.5	5.5	5.5
C_t (Typ.) [pF]	12	8.5	8.5	8.5	8.5
R_{DYN} (Typ.) [Ω]	0.2	0.2	0.2	0.2	0.2
V_c (Typ.) [V] @I_{PP} = 1 A	7	8	8	8	8

(Note) This product is an ESD protection diode and cannot be used for purposes other than ESD protection.

◆Return to Block Diagram TOP

Transistor output photocoupler (AC input)

TLP292 / TLP292-4

Advanced functions · Stable operation

High efficiency · Low loss

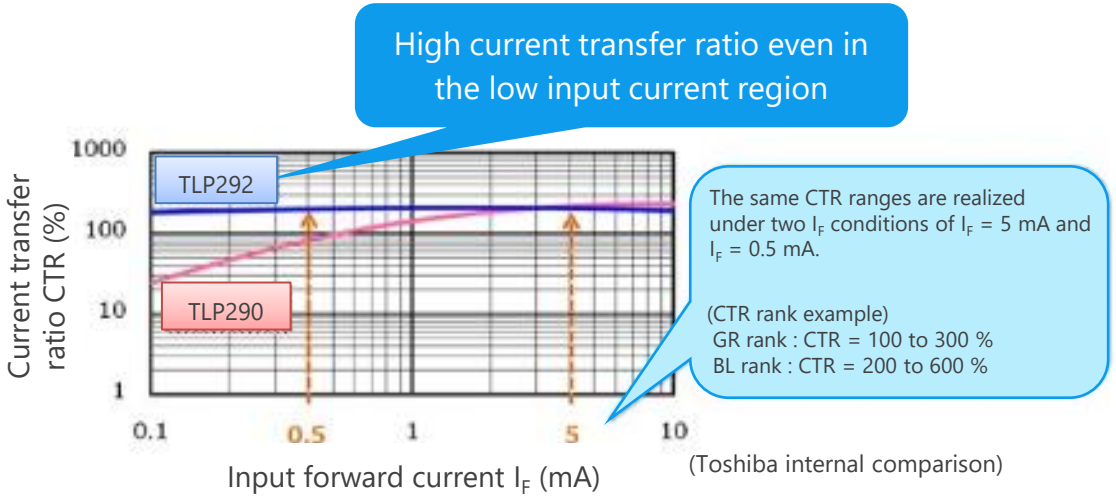
Small size packages

Value provided

High CTR (Current Transfer Ratio) is realized even in low input current range (I_F = 0.5 mA).

1 High current transfer

The TLP292 and TLP292-4 are high-isolation photocouplers that optically couple phototransistor and high output infrared LED. Higher CTR in low input current range (@I_F = 0.5 mA) is realized.



(Toshiba internal comparison)

2 Operating temperature is expanded to 125 °C

The operating temperature range is expanded (-55 to 125 °C) to ensure operating under severe conditions.

Lineup

Part number	TLP292	TLP292-4
Package	SO4 	SO16 
BV_S [Vrms]	3750	3750
T_{opr} [°C]	-55 to 125	-55 to 125

◆Return to Block Diagram TOP

3 IC output photocoupler for high speed communication (AC input)

TLP2395 / TLP2398

Advanced functions · Stable operation

High efficiency · Low loss

Small size packages

Value provided

Input side supports the AC input and output side supports both sink and source logic signals.

1 AC input and sink/source logic output

AC input is supported by adding a reverse parallel LED on the LED side of the photocoupler. Output supports both sink and source logic signal without adding a pull-up or pull-down resistor.

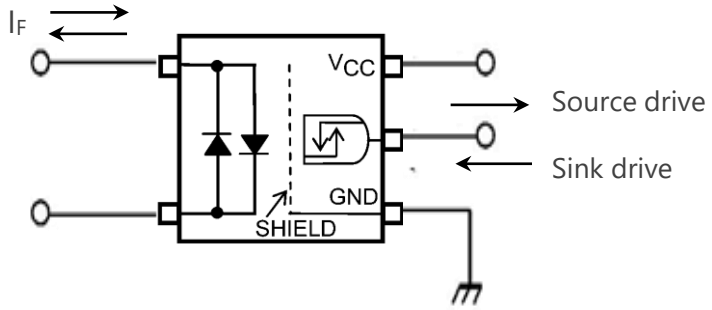
2 Operating temperature is expanded to 125 °C

The operating temperature range is expanded (-40 to 125 °C) to ensure operating under severe conditions.

3 Wide supply voltage range V_{CC} = 3.0 to 20 V

Operation with a supply voltage from 3.0 V is possible, enabling the use as common components in mixed 3.3 V and 5.0 V systems.

TLP2395, TLP2398



UL approved : UL1577, File No.E67349
cUL approved : Component Acceptance Service No.5A File No.E67349
VDE approved : EN60747-5-5, EN62368-1 (Note)
CQC approved : GB4943.1, GB8898 Thailand factory
(Note) To select a VDE approved type, designate the "Option (V4)".

Lineup

Part number	TLP2395	TLP2398
Package	5pin SO6 	5pin SO6 
BV_S [Vrms]	3750	3750
T_{opr} [°C]	-40 to 125	-40 to 125
Output type	Buffer logic	Inverter logic

◆Return to Block Diagram TOP

Value provided

Supports the system design compliant to IEC 61131-2 Type 1.

1 IEC 61131-2 Type1 compliant

Minimum and maximum value of input threshold current are specified to support designing a digital input module to follow the operation range that is defined in IEC 61131-2 Type 1.

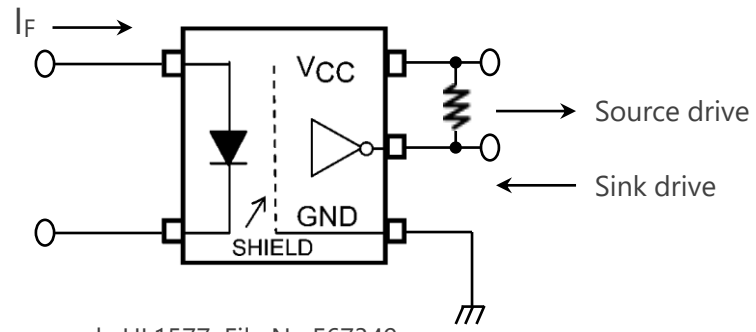
2 High immunity to slow inputs

The output without chattering is kept even when the input has gradual rise/fall time until 60 s at 24 V.

3 Wide supply voltage range V_{CC} = 2.7 to 5.5 V

Operation with a supply voltage from 2.7 V to 5.5 V is possible, enabling the use as common components in mixed 3.3 V and 5.0 V systems.

TLP2363



UL approved : UL1577, File No.E67349
cUL approved : Component Acceptance Service No.5A File No.E67349
VDE approved : EN60747-5-5, EN62368-1 (Note)
CQC approved : GB4943.1, GB8898 Japan factory
(Note) To select a VDE approved type, designate the "Option (V4)".

Lineup

Part number	TLP2363
Package	5pin SO6 
BV_S [Vrms]	3750
T_{opr} [°C]	-40 to 105
Output type	Open collector

◆Return to Block Diagram TOP

5 One-gate logic IC

TC7WZ07FK / TC7WZ00FK

Advanced functions · Stable operation

High efficiency · Low loss

Small size packages

Value provided

Offers ease of use through a lineup of common packages and suitable for low voltage operation.

1 Low power and high speed

High speed operation is achieved with the low power of CMOS.

2 Compatible with low voltage systems

The wide operating voltage range of 1.65 to 5.5 V enables to be used with low voltage systems.

3 Power down protection function

The output terminal has a 5.5 V power-down protection function to protect the device when the power is off.

TC7WZ07FK

TC7WZ00FK

Lineup

Part number	TC7WZ07FK	TC7WZ00FK
Package	US8 	US8 
V_{CC} [V]	1.65 to 5.5	1.65 to 5.5
t_{PZL}/t_{PD} (Typ.) [ns] @V_{CC} = 5 V, C_L = 50 pF	2.3	2.4
T_{opr} (Max) [°C]	125	125
Function	Non-Inverter (open drain)	2-Input NAND

◆Return to Block Diagram TOP

6 Transistor output photocoupler (DC input)

TLP293 / TLP293-4

Advanced functions · Stable operation

High efficiency · Low loss

Small size packages

Value provided

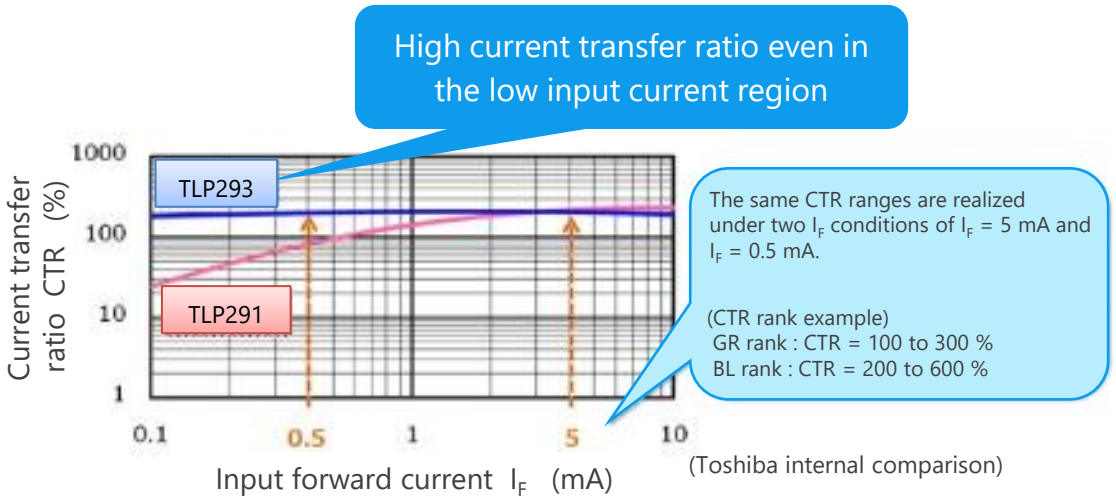
High CTR (Current Transfer Ratio) is realized even in low input current range (I_F = 0.5 mA).

1 High current transfer ratio

The TLP293 and TLP293-4 are high-isolation photocouplers that optically couple phototransistor and high output infrared LED. Higher CTR in low input current range (@I_F = 0.5 mA) is realized.

2 Operating temperature is expanded to 125 °C

The operating temperature range is expanded (-55 to 125 °C) to ensure operating under severe conditions.



(Toshiba internal comparison)

Lineup

Part number	TLP293	TLP293-4
Package	SO4 	SO16 
BV_S [Vrms]	3750	3750
T_{opr} [°C]	-55 to 125	-55 to 125

◆Return to Block Diagram TOP

IC output photocoupler for high speed communication (DC input)

TLP2355 / TLP2358

Advanced functions · Stable operation | High efficiency · Low loss | Small size packages

Value provided

Supports both sink and source logic signal outputs.

1 Sink and source logic output

Output supports both sink and source logic signal without adding a pull-up or pull-down resistor.

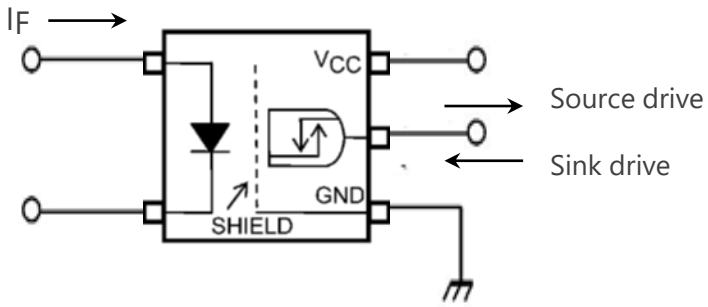
2 Operating temperature is expanded to 125 °C

The operating temperature range is expanded (-40 to 125 °C) to ensure operating under severe conditions.

3 Wide supply voltage range V_{CC} = 3.0 to 20 V

Operation with a supply voltage from 3.0 V is possible, enabling the use as common components in mixed 3.3 V and 5.0 V systems.

TLP2355, TLP2358



UL approved : UL1577, File No.E67349
cUL approved : Component Acceptance Service No.5A File No.E67349
VDE approved : EN60747-5-5, EN62368-1 (Note)
CQC approved : GB4943.1, GB8898 Thailand factory
(Note) To select a VDE approved type, designate the "Option (V4) ".

Lineup

Part number	TLP2355	TLP2358
Package	5pin SO6 	5pin SO6 
BV_S [Vrms]	3750	3750
T_{opr} [°C]	-40 to 125	-40 to 125
Output type	Buffer logic	Inverter logic

◆Return to Block Diagram TOP

8 Small signal MOSFET

SSM3K341R / SSM3K341TU

Advanced functions · Stable operation | High efficiency · Low loss | Small size packages

Value provided

Suitable for power management switches, contributing to the board area miniaturization.

1 High temperature operation

Channel temperature up to 175 °C and storage temperature from -55 to 175 °C are supported to ensure operating under severe conditions.

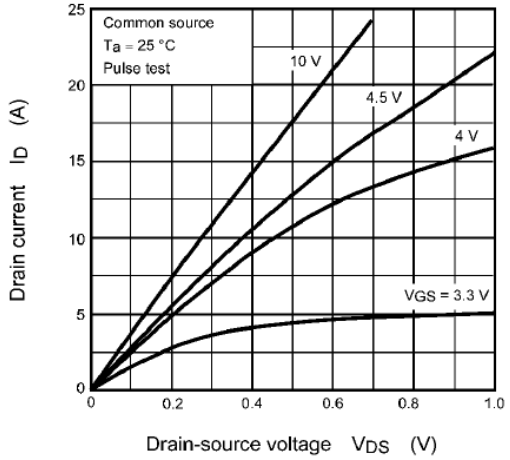
2 Low on-resistance

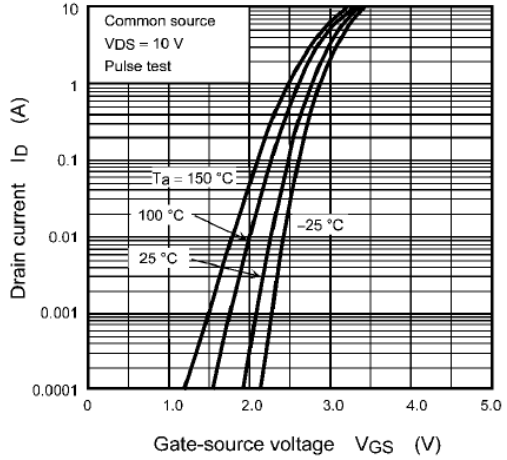
By reducing the on-resistance between the drain and source, heat generation and power consumption can be reduced.

3 Small size package

In addition to the industry standard SOT-23F package, a smaller UFM package is also available with the same level of power consumption, contributing to overall set miniaturization.

SSM3K341R, SSM3K341TU





Lineup

Part number	SSM3K341R	SSM3K341TU
Package	SOT-23F 	UFM 
Polarity	N-ch	N-ch
$R_{DS(ON)}$ (Typ.) [Ω] @V_{GS} = 10 V	28	28
I_D [A]	6	6
V_{DSS} [V]	60	60
V_{GSS} [V]	±20	±20

◆Return to Block Diagram TOP

9 Transistor array

TBD62003AFWG / TBD62083AFG / TBD62064AFG

Advanced functions · Stable operation

High efficiency · Low loss

Small size packages

Value provided

High voltage and large current output are realized by adopting DMOS FET output.

1 High voltage and high current

Adoption of the BiCD, which is a high voltage monolithic process, an FET output is possible with an absolute maximum voltage of 50 V and selectable current rating types of 0.3, 0.5 and 1.5 A.

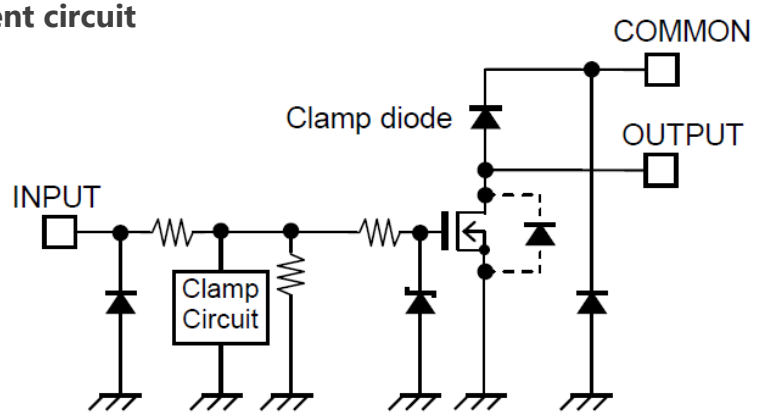
2 Built-in output clamp diode

Built-in output clamp diode regenerates the back electromotive force generated by switching of an inductive load

3 Low loss

Low loss is achieved by the low R_{ON} of the output circuit.

Equivalent circuit



(Note) Equivalent circuit may be simplified for explanatory purpose.

Lineup

Part number	TBD62003AFWG	TBD62083AFG	TBD62064AFG
Package	P-SOP16-0410-1.27-002	SOP18-P-375-1.27	HSOP16-P-300-1.00
Output type	Sink	Sink	Sink
Number of channels	7ch	8ch	4ch
Input level	H	H	H
I_{OUT} [mA/ch]	500	500	1500
V_{OUT} [V]	50	50	50

◆Return to Block Diagram TOP

Value provided

Suitable for switching regulators, easy to use and contributes to the board area miniaturization.

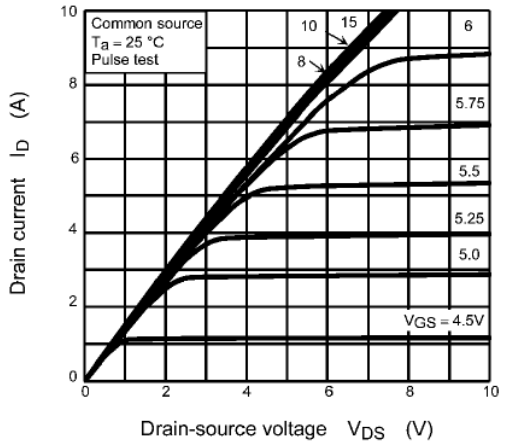
1 Low on-resistance

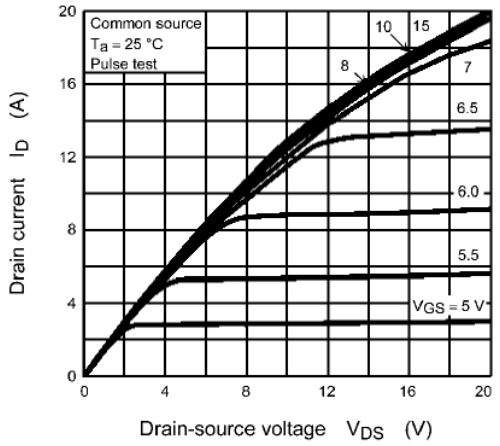
By reducing the on-resistance between the drain and source, heat generation and power consumption are reduced.

2 Low leak current

Drain cut-off current I_{DSS} = 10 μA (Max) (@V_{DS} = 640 V)

TK10A80E





Lineup

Part number	TK10A80E
Package	TO-220SIS 
V_{DSS} [V]	800
I_D [A]	10
P_D [W]	50
C_{iss} (Typ.) [pF]	2000
$R_{DS(ON)}$ (Max) [Ω]	1.0
Polarity	N-ch

◆Return to Block Diagram TOP

11 Transistor output photocoupler (DC input)

TLP383

Advanced functions · Stable operation

High efficiency · Low loss

Small size packages

Value provided

Contributes to reduction of board area, maintenance-free operation and improved reliability.

1 High isolation voltage with a small/thin package

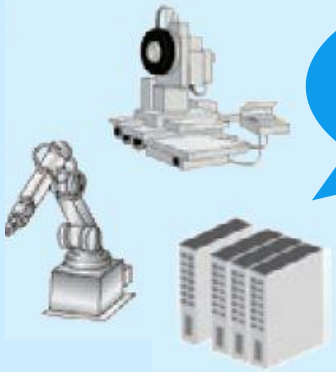
It is a highly isolated photocoupler that phototransistors and infrared light emitting diodes are optically coupled, and achieved a high isolation voltage of 5000 Vrms. In addition, since the SO6L package is smaller and thinner than Toshiba standard DIP package, high density mounting is possible.

2 Operating temperature is expanded to 125 °C

The operating temperature range is expanded (-55 to 125 °C) to ensure operating under severe conditions.

Industrial equipment

Inverters
Servo amps
Robots
FA
High power supplies
Security
Semiconductor testers
PLC



High isolation and noise immunity

Lineup

Part number	TLP383
Package	4pin SO6L 
BV_S [Vrms]	5000
T_{opr} [°C]	-55 to 125

◆Return to Block Diagram TOP

Value provided

Photorelay consists of an infrared light emitting diode optically coupled to a photo-MOSFET and is suitable for replacing mechanical relays.

1 Low on-resistance

Low on-resistance contributes to low power consumption.

2 Wide on-state current range

The range of on-state current I_{ON} is wide and suitable for power line control.

I_{ON} = 2.0 A (Max)

(TLP241B: A connection) [Note]

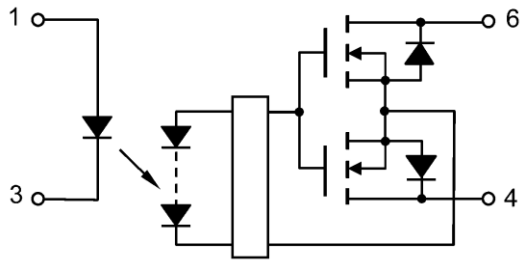
3 Small package

Packages contribute to reduce the size of the set and improve the degree of freedom for design are provided.

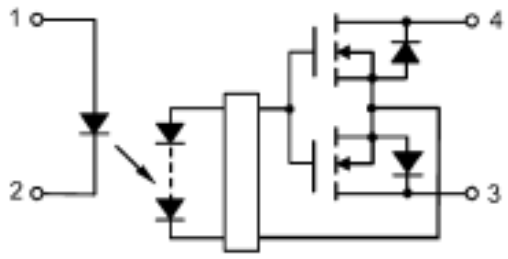
VSON package size: 1.45 x 2.45 x 1.3 mm (Typ.)

[Note] Please refer to the technical data sheet for connection.

TLP241B
Internal equivalent circuit



TLP3420
Internal equivalent circuit



Lineup

Part number	TLP241B	TLP3420
Package	DIP4 	VSON4 
I_{ON} [A]	2.0	0.1
V_{OFF} [V]	100	100
R_{ON} (Max) [Ω]	0.2	14
I_{FT} (Max) [mA]	3	3
BV_S [Vrms]	5000	500

◆Return to Block Diagram TOP

13 Darlington transistor output photocoupler

TLP187 / TLP627M

Advanced functions · Stable operation

High efficiency · Low loss

Small size packages

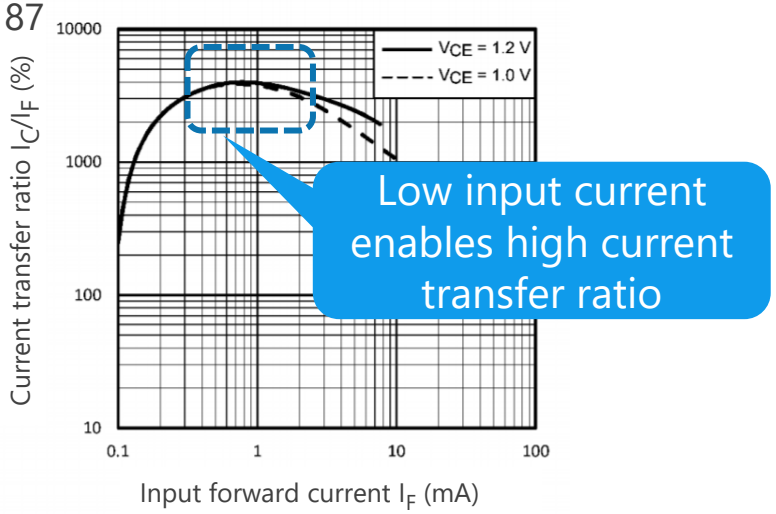
Value provided

High output current can be controlled by low input current.

1 High current transfer ratio (1000% (Min)) at low input current (I_F = 1 mA) is realized

Darlington transistor detector chip contributes to high current transfer ratio (1000% (Min)). (TLP187)

TLP187



2 Operating temperature is expanded to 110 °C

The operating temperature range is expanded (-55 to 110 °C) to ensure operating under severe conditions.
(Meanwhile, existing TLP127 was up to 100 °C)

Lineup

Part number	TLP187	TLP627M
Package	4pin SO6 	DIP4 
BV_S [Vrms]	3750	5000
T_{opr} [°C]	-55 to 110	-55 to 110

◆Return to Block Diagram TOP

14 Standard digital isolator

DCL54xx01 Series [Note 1]

Advanced functions · Stable operation

High efficiency · Low loss

Small size packages

[Note 1] Under development

Value provided

Digital isolator for high speed logic circuits, suitable for isolating communication lines.

1 High speed response

It is a four-channel high speed logic digital isolator and realizes the data rate of 150 Mbps (Max).

2 High noise immunity

Magnetic coupling type can block the common-mode noise and realize stable operation in case of large dv/dt noise is applied between the input and output during switching.

Common Mode Transient Immunity (CMTI)

= ±200 [kV/μs] (Typ.)

3 High reliability

Double isolation structure provides high dielectric strength and reliability.

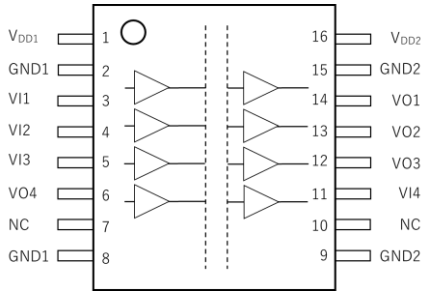
Reinforced isolation 5000 [Vrms]

Estimated isolation life >70 years [Note 2]

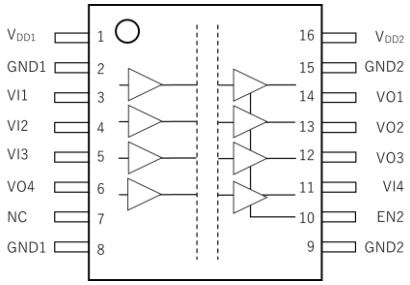
[Note 2] Estimated by TDDB (Time Dependent Dielectric Breakdown) test

Circuit configuration

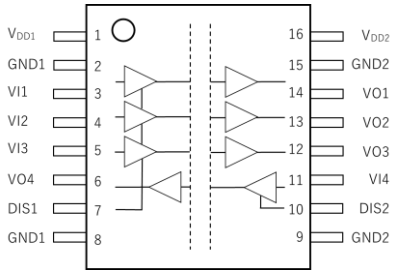
DCL540C01
DCL540D01



DCL540L01
DCL540H01



DCL541A01
DCL541B01



Lineup

Part number	DCL540C01	DCL540D01	DCL540L01	DCL540H01	DCL541A01	DCL541B01
Package	SOIC16-W 					
Channel	4 (Forward: 4, Reverse: 0)				4 (Forward: 3, Reverse: 1)	
BV_S [Vrms]	5000					
T_{opr} [°C]	-40 to 110					
Default Output State	Low	High	Low	High	Low	High
Control signal	-		Output Enable		Input Disable	

[Note 3] The specification is subject to change without notice.

◆Return to Block Diagram TOP

15 High voltage CMOS linear regulator

TCR1HFxxA / TCR1HFxxB [Note 1]

Advanced functions · Stable operation | High efficiency · Low loss | Small size packages

[Note 1] Under development

Value provided

It supports a wide power supply voltage range and contributes to low power consumption in standby operation.

1 Wide supply voltage range V_{CC} = 4.0 to 36 V

It can be operated from a power supply voltage of 4 V and has a power supply voltage range compatible with general 5 to 24 V power supplies.

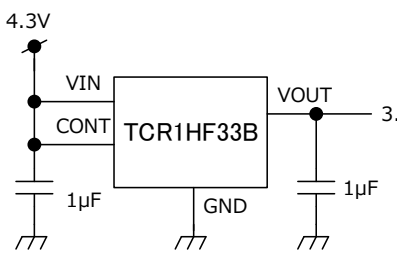
2 Low power consumption operation

The operating current consumption is 1 µA (Typ.) and it is possible to reduce the power consumption in the standby state of the device.

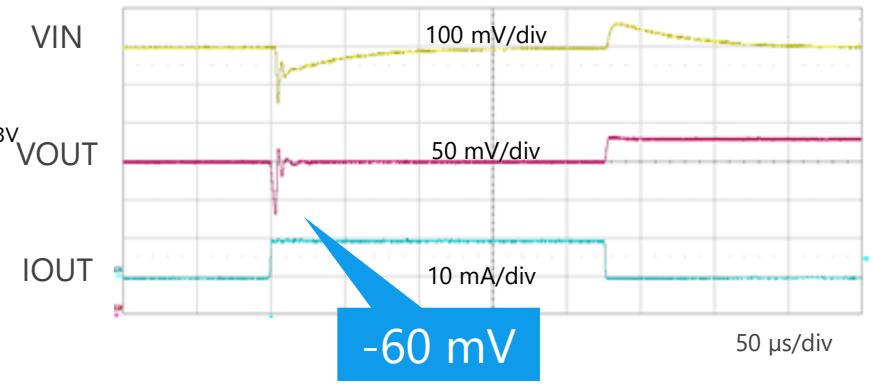
3 High speed stable operation

It has high speed load response characteristics and can supply a stable voltage even when high speed startup is performed from a no-load state.

Measurement circuit



Load transient (0 mA ←→ 10 mA)



Lineup

Part number	Output voltage [V]	Marking
TCR1HF18A/B	1.8	1F8
TCR1HF25A/B	2.5	2F5
TCR1HF28A/B	2.8	2F8
TCR1HF30A/B	3.0	3F0
TCR1HF31A/B	3.1	3F1
TCR1HF32A/B	3.2	3F2
TCR1HF33A/B	3.3	3F3
TCR1HF50A/B	5.0	5F0

A : With discharge function, B : Without discharge function

[Note 2] The specification is subject to change without notice.

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16 Small surface mount LDO regulator

TCR3DF / TCR2EF Series [Note]

Advanced functions · Stable operation | High efficiency · Low loss | Small size packages

[Note] For TCR2EF Series, some output voltage types are under development.

Value provided

Wide lineup of products suitable for high performance requirements, from general purpose types to small package types are provided.

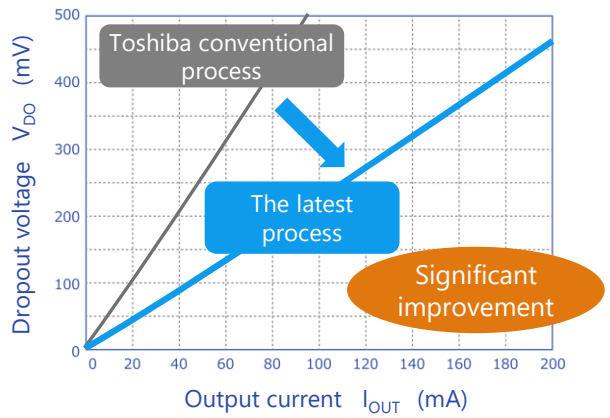
1 Low dropout voltage

The originally developed latest process significantly improved the dropout voltage characteristics.

2 High PSRR Low output noise voltage

Many product series that realize both high PSRR (Power Supply Rejection Ratio) and low output noise voltage characteristics are provided. They are suitable for stable power supply for analog circuit.

Low dropout voltage



(Note) Toshiba internal comparison

Lineup

Part number	TCR3DF Series	TCR2EF Series
Package	SMV 	SMV 
V_{IN} (Max) [V]	5.5	5.5
I_{OUT} (Max) [mA]	300	200
V_{OUT} [V]	1.0 to 4.5	1.0 to 5.0

◆Return to Block Diagram TOP

Value provided

CMOS's features include low power consumption and improved noise resistance, which makes it easy to use.

1 Low power consumption and high speed operation

High speed operation is realized with the low power consumption characteristic of CMOS.

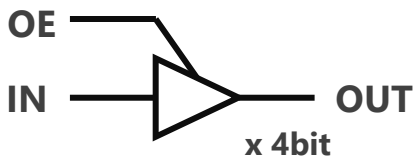
2 Compatible with low voltage systems

The wide operating voltage range of 2.0 to 5.5 V enables to be used with low voltage systems.

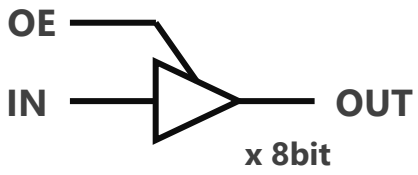
3 Improved noise resistance

VHCV series with improved noise immunity by Schmitt trigger input circuits are also provided.

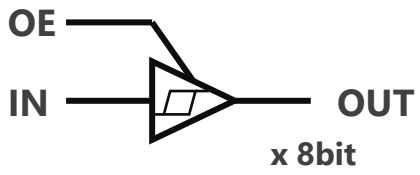
74VHC125FT



74VHC541FT



74VHCV541FT



With Schmitt input type

Lineup

Part number	74VHC125FT	74VHC541FT	74VHCV541FT
Package	TSSOP14B 	TSSOP20B 	
V_{CC} [V]	2.0 to 5.5	2.0 to 5.5	1.8 to 5.5
t_{PD} (Typ.) [ns] @V_{CC} = 5 V, C_L = 15 pF	3.8	3.5	3.9
T_{opr} (Max) [°C]	125	125	125
Function	Quad bus buffer Non-inverted (3-state outputs)	Octal bus Buffer Non-inverted (3-state outputs)	Octal Schmitt bus buffer Non-inverted (3-state outputs)

◆Return to Block Diagram TOP

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