

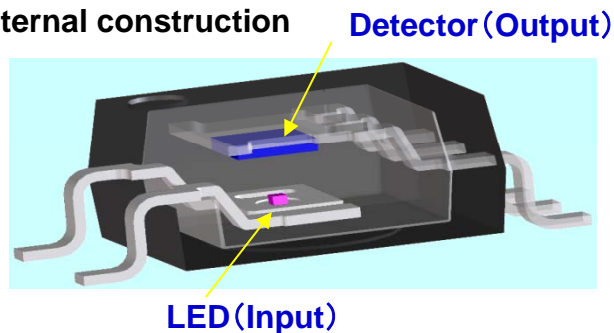
# TOSHIBA

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## TLP180/181 vs. TLP184/185 TLP280/281/284/285 vs. TLP290/291 comparison chart

※New PKG S06  
internal construction



Toshiba Discrete Semiconductor  
Technology Corporation  
Discrete Semiconductor  
Technical Marketing & Support Div.

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# TLP180/181 vs. TLP184/185

Reference

## ■ Package dimensions Comparison

Items	TLP180/181	TLP184/185
Package dimensions	<p>Unit:[mm]</p>	<p>Unit:[mm]</p>
UL approval	File No.E67349	File No.E67349
VDE approval	Certificate No.40009347	Certificate No.40009261
BSI approval	Certificate No.8225,8226	Certificate No.9020,9021

**Example rand patterns remain the same.**

# TLP180/181 vs. TLP184/185

Reference

## Construction Comparison

Items	TLP180/181	TLP184/185
Internal constructions	<p>LED Lead frame detector</p>	<p>Lead frame detector LED</p>
Height Width	<p>2.8 mm (max) 7.0 ± 0.4 mm</p>	<p>2.3 mm (max) 7.0 ± 0.4 mm</p>
Creepage / Clearance	4.0 mm (min)	5.0 mm (min)
Isolation thickness	0.4 mm (min)	0.4 mm (min)
Lead Frame	Fe-Ni Alloy	Cu Alloy
Lead plating	Sn-Ag-Cu	Ni/Pd/Au

## ◆ Comparison of Absolute Maximum Ratings

Reference

Absolute Maximum Ratings are basically same.

(Ta=25°C)

Characteristics	Symbol	Unit	TLP180	TLP184	TLP181	TLP185
Forward current	IF	mA	±50	±50	50	50
Pulse forward current(Note1)	IFP	A	±1	±1	1	1
Reverse voltage	VR	V	—	—	5	5
Collector-emitter voltage	VCEO	V	80	80	80	80
Emitter-collector voltage	VECO	V	7	7	7	7
Collector current	IC	mA	50	50	50	50
Collector power dissipation	PC	mW	150	150	150	150
Operating temperature range	Topr	°C	−55~110	−55~110	−55~110	−55~110
Storage temperature range	Tstr	°C	−55~125	−55~125	−55~125	−55~125
Lead soldering temperature	Tsol	°C	260(10s)	260(10s)	260(10s)	260(10s)
Total package power dissipation	PT	mW	200	200	200	200
Isolation voltage(Note2)	BVs	Vrms	3750	3750	3750	3750

Note 1: Pulse width ≤ 100 μs, frequency = 100Hz

Note 2: AC, 1 min, R.H.≤60%. LED pins and detector pins are shorted respectively.

# ◆ Comparison of Main Characteristics

Reference

Electrical characteristics (Ta=25°C)

## TLP180/184

CHARACTERISTIC	SYMBOL	UNIT	TEST ONDITION	TLP180			TLP184		
				Min.	typ.	Max.	Min.	typ.	Max.
Forward Voltage	VF	V	IF=±10mA	1	1.15	1.3	1.1	1.25	1.4
Collector Dark Current	ICEO	uA	VCE=48V	-	0.01	0.1	-	0.01	0.08
Collector-Emitter Breakdown Voltage	V(BR)CEO	V	Ic=0.5mA	80	-	-	80	-	-
Emitter-Collector Breakdown Voltage	V(BR)ECO	V	IE=0.1mA	7	-	-	7	-	-
Current Transfer Ratio	IC/IF	%	IF=±5mA, VCE=5V	50	-	600	50	-	400
Saturated CTR	IC/IF(sat) Rank GB	%	IF=±1mA, VCE=0.4V	-	60	-	-	60	-
Saturated CTR				30	-	-	30	-	-
Collector-Emitter Saturation Voltage	VCE(sat) Rank GB	V	IC=2.4mA, IF=±8mA	-	-	0.4	-	-	0.3
Collector-Emitter Saturation Voltage			IC=0.2mA, IF=±1mA	-	-	0.4	-	-	0.3
OFF-State Collector Current	IC(off)	uA	VF=0.7V, VCE=48V	-	-	10	-	1	10
CTR symmetry	IC(ratio)	uA	Ic(IF=-5mA)/Ic(IF=5mA)	0.33	-	3	0.33	-	3

## TLP181/185

CHARACTERISTIC	SYMBOL	UNIT	TEST ONDITION	TLP181			TLP185		
				Min.	typ.	Max.	Min.	typ.	Max.
Forward Voltage	VF	V	IF=10mA	1	1.15	1.3	1.1	1.25	1.4
Reverse Current	IR	uA	VR=5V	-	-	10	-	-	5
Collector Dark Current	ICEO	uA	VCE=48V	-	0.01	0.1	-	0.01	0.08
Collector-Emitter Breakdown Voltage	V(BR)CEO	V	Ic=0.5mA	80	-	-	80	-	-
Emitter-Collector Breakdown Voltage	V(BR)ECO	V	IE=0.1mA	7	-	-	7	-	-
Current Transfer Ratio	IC/IF	%	IF=5mA, VCE=5V	50	-	600	50	-	400
Saturated CTR	IC/IF(sat) Rank GB	%	IF=1mA, VCE=0.4V	-	60	-	-	60	-
Saturated CTR				30	-	-	30	-	-
Collector-Emitter Saturation Voltage	VCE(sat) Rank GB	V	IC=2.4mA, IF=8mA	-	-	0.4	-	-	0.3
Collector-Emitter Saturation Voltage			IC=0.2mA, IF=1mA	-	-	0.4	-	-	0.3
OFF-State Collector Current	IC(off)	uA	VF=0.7V, VCE=48V	-	-	10	-	1	10

◆ Comparison of CTR rank

The upper limit of CTR is changed to 400% in TLP184/185 from 600% in TLP180/181.

- (1) If you are using “BL rank” in TLP180/181, please order a “BLL rank” in TLP184/185.
- (2) Please note that the upper limit of Blank and GB rank in TLP184/185 is 400%.

TLP180				TLP184		
	min	max			min	max
Blank	50	600	→	Blank	50	400
Y rank	50	150	→	Y rank	50	150
GR rank	100	300	→	GR rank	100	300
BL rank	200	600	→	<b>BLL rank</b>	200	400
GB rank	100	600	→	GB rank	100	400

Unit :[%]

TLP181				TLP185		
	min	max			min	max
Blank	50	600	→	Blank	50	400
Y rank	50	150	→	Y rank	50	150
GR rank	100	300	→	GR rank	100	300
GRL rank	100	200	→	GRL rank	100	200
GRH rank	150	300	→	GRH rank	150	300
BL rank	200	600	→	-	-	-
BLL rank	200	400	→	<b>BLL rank</b>	200	400
GB rank	100	600	→	GB rank	100	400

# TLP280/281/284/285 vs. TLP290/291

Reference

## ■ Package dimensions Comparison

Items	TLP280/281/284/285	TLP290/291	
Package dimensions	<p>Unit:[mm]</p>	<p>Unit:[mm]</p>	
UL approval	File No.E67349	under application	
VDE approval	Certificate No.40009261	under application	
BSI approval	TLP280/281	No.8971,8972	under application
	TLP284/285	No.8143,8144	

Example rand patterns remain the same.

# TLP280/281/284/285 vs. TLP290/291 Reference

## ■ Construction Comparison

Items	TLP280/281/284/285		TLP290/291
Internal constructions			
Height Width			
Creepage / Clearance	TLP280/281	4.0mm (min)	5.0 mm (min)
	TLP284/285	5.0mm (min)	
Isolation thickness	0.4 mm (min)		0.4 mm (min)
Lead Frame	Fe-Ni Alloy		Cu Alloy
Lead plating	Sn-Ag-Cu		Ni/Pd/Au



## ◆ Comparison of Absolute Maximum Ratings

Reference

Absolute Maximum Ratings are basically same.

(Ta=25°C)

CHARACTERISTIC		Symbol	Unit	TLP280	TLP284	TLP290*	TLP281	TLP285	TLP291*
LED	Forward current	$I_F$	mA	± 50		± 50	50		50
	Pulse forward current (Note1)	$I_{FP}$	A	± 1		± 1	1		1
	Reverse Voltage	$V_R$	V	—		—	5		5
Detector	Collector-emitter voltage	$V_{CEO}$	V	80		80	80		80
	Emitter-collector voltage	$V_{ECO}$	V	7		7	7		7
	Collector current	$I_C$	mA	50		50	50		50
	Collector power dissipation	$P_C$	mW	150		150	150		150
Operating temperature range		$T_{opr}$	°C	-55~100	-55~110	-55~110	-55~100	-55~110	-55~110
Storage temperature range		$T_{stg}$	°C	-55~125		-55~125	-55~125		-55~125
Lead soldering temperature		$T_{sol}$	°C	260(10s)		260(10s)	260(10s)		260(10s)
Total package power dissipation		$P_T$	mW	200		200	200		200
Isolation voltage(Note2)		$BV_s$	$V_{rms}$	2500	3750	3750	2500	3750	3750

\* Under development

Note 1: Pulse width ≤ 100 μs, frequency = 100Hz

Note 2: AC, 1 min, R.H.≤60%. LED pins and detector pins are shorted respectively.

# ◆ Comparison of Main Characteristics

Reference

## Electrical characteristics (Ta=25°C)

### TLP280 / 284 vs. TLP290

CHARACTERISTIC	SYMBOL	UNIT	TEST ONDITION	TLP280, TLP284			TLP290 *		
				Min.	typ.	Max.	Min.	typ.	Max.
Forward Voltage	VF	V	IF=±10mA	1	1.15	1.3	1.1	1.25	1.4
Collector Dark Current	ICEO	uA	VCE=48V	-	0.01	0.1	-	0.01	0.08
Collector-Emitter Breakdown Voltage	V(BR)CEO	V	Ic=0.5mA	80	-	-	80	-	-
Emitter-Collector Breakdown Voltage	V(BR)ECO	V	IE=0.1mA	7	-	-	7	-	-
Current Transfer Ratio	IC/IF	%	IF=±5mA, VCE=5V	50	-	600	50	-	400
Saturated CTR	IC/IF(sat)	%	IF=±1mA, VCE=0.4V	-	60	-	-	60	-
Saturated CTR Rank GB				30	-	-	30	-	-
Collector-Emitter Saturation Voltage	VCE(sat)	V	IC=2.4mA, IF=±8mA	-	-	0.4	-	-	0.3
Collector-Emitter Saturation Voltage Rank GB			IC=0.2mA, IF=±1mA	-	-	0.4	-	-	0.3
OFF-State Collector Current	IC(off)	uA	VF=0.7V, VCE=48V	-	-	10	-	1	10
CTR symmetry	IC(ratio)	uA	Ic(IF=-5mA)/Ic(IF=5mA)	0.33	-	3	0.33	-	3

\* Under development

### TLP281 / 285 vs. TLP291

CHARACTERISTIC	SYMBOL	UNIT	TEST ONDITION	TLP281, TLP285			TLP291 *		
				Min.	typ.	Max.	Min.	typ.	Max.
Forward Voltage	VF	V	IF=10mA	1	1.15	1.3	1.1	1.25	1.4
Reverse Current	IR	uA	VR=5V	-	-	10	-	-	5
Collector Dark Current	ICEO	uA	VCE=48V	-	0.01	0.1	-	0.01	0.08
Collector-Emitter Breakdown Voltage	V(BR)CEO	V	Ic=0.5mA	80	-	-	80	-	-
Emitter-Collector Breakdown Voltage	V(BR)ECO	V	IE=0.1mA	7	-	-	7	-	-
Current Transfer Ratio	IC/IF	%	IF=5mA, VCE=5V	50	-	600	50	-	400
Saturated CTR	IC/IF(sat)	%	IF=1mA, VCE=0.4V	-	60	-	-	60	-
Saturated CTR Rank GB				30	-	-	30	-	-
Collector-Emitter Saturation Voltage	VCE(sat)	V	IC=2.4mA, IF=8mA	-	-	0.4	-	-	0.3
Collector-Emitter Saturation Voltage Rank GB			IC=0.2mA, IF=1mA	-	-	0.4	-	-	0.3
OFF-State Collector Current	IC(off)	uA	VF=0.7V, VCE=48V	-	-	10	-	1	10

\* Under development

◆ Comparison of CTR rank

The upper limit of CTR is changed to 400% in TLP290/291 from 600% in TLP280/281/284/285.

- (1) If you are using “BL rank” in TLP280/281/284/285, please order a “BLL rank” in TLP290/291.
- (2) Please note that the upper limit of Blank and GB rank in TLP290/291 is 400%.

Unit :[%]

TLP280 / 284				TLP290		
	min	max			min	max
Blank	50	600	→	Blank	50	400
Y rank	50	150	→	Y rank	50	150
GR rank	100	300	→	GR rank	100	300
BL rank	200	600	→	<b>BLL rank</b>	200	400
GB rank	100	600	→	GB rank	100	400

TLP281 / 285				TLP291		
	min	max			min	max
Blank	50	600	→	Blank	50	400
Y rank	50	150	→	Y rank	50	150
GR rank	100	300	→	GR rank	100	300
GRL rank	100	200	→	GRL rank	100	200
GRH rank	150	300	→	GRH rank	150	300
BL rank	200	600	→	-		
BLL rank	200	400	→	<b>BLL rank</b>	200	400
GB rank	100	600	→	GB rank	100	400

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