

TOSHIBA

※Unauthorized copying and replication of the contents of this text, images and information are strictly prohibited.

Toshiba Semiconductor News

<October/2023>

Toshiba Electronic Devices & Storage Corporation

Semiconductor Sales & Marketing Center

Please contact the following address if you have any questions.

E-mail : semicon-DiscreteNews@ml.toshiba.co.jp

Toshiba Electronic Devices & Storage Corporation Products :

<https://toshiba.semicon-storage.com/ap-en/top.html>

TOSHIBA

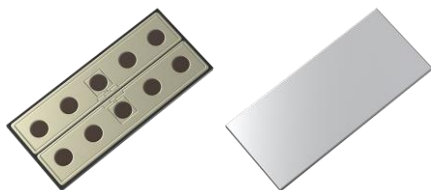
Small Signal Device

New!! Information

Click here for the product page of [SSM10N961L](#).

Low ON-resistance N-channel common drain MOSFET with 30V breakdown voltage is suitable for USB-equipped devices and battery pack protection

SSM10N961L



Product Features

• 30V breakdown voltage

SSM10N961L is available for the mobile power supply line of load switch and for Note book PCs' and tablets' Li-Ion battery pack protection which require over 12V resistance.

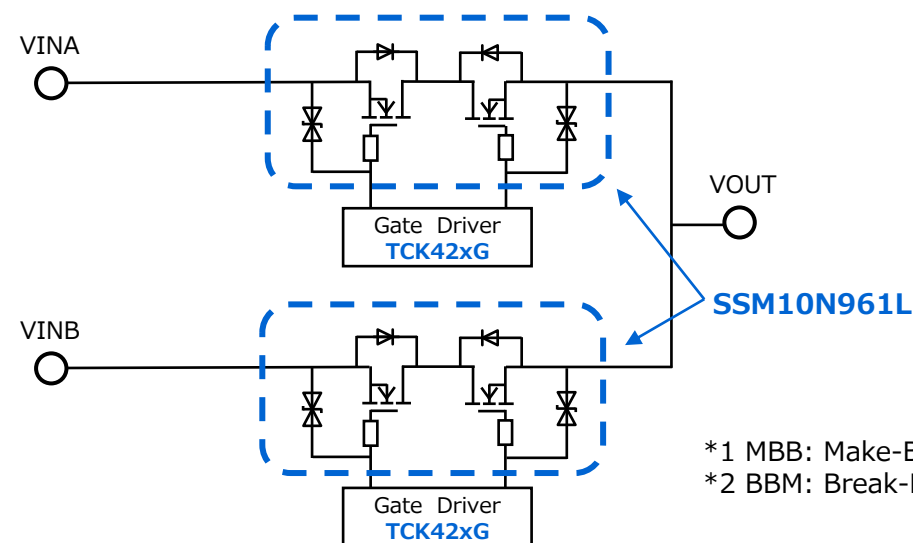
• Small and thin package

SSM10N961L is small and thin package:
TCSPAG-341501 "1.47mm×3.37mm [typ] / t=0.11mm [typ]"
It contributes to high-density mounting of device.

• Low ON-resistance

R_{SS(ON)} : 9.9 mΩ (Typ.) @V_{GS} = 10 V
R_{SS(ON)} : 13.6 mΩ (Typ.) @V_{GS} = 4.5 V

By combining with the TCK42xG series, a load switch circuit with reverse current protection and a power multiplexer circuit capable of switching between MBB*¹ and BBM*² operations can be designed. It helps to shrink the designing / developing term of devices. **SSM10N961L's reference design will be released in November.**



*1 MBB: Make-Before-Break
*2 BBM: Break-Before-Make

Power Device

New!! Information

Lineup Expansion of 40 V N-Channel Power MOSFETs that Contribute to Lower Power Consumption for Automotive Equipment

launching new series of DTMOSVI/HSD product

Description

We launch the DTMOSVI/HSD Series "TK042N65Z5" / "TK095N65Z5", a new-generation super-junction structure power MOSFET with high speed recovery type for switching power supplies of industrial equipment.

The DTMOS VI "HSD" series has the same recovery characteristics as the previous generation DTMOS IV "HSD" series and reduces high-temperature I_{DSS} . It also has high-speed switching characteristics based on the DTMOS VI design. Compared to the existing TK62N60W5 "Note 1", the TK042N65Z5 reduces high-temperature I_{DSS} by approximately 90% "Note 2" and the figure of merit: "drain-source on-resistance" \times "Gate-drain charge" by approximately 70% "Note 2". This makes it possible to improve the conversion efficiency of switching power supplies.

"Note1" DTMOS IV "HSD" series, "Note2" Actual measurement comparison

Features

- High speed body diode
- Reduced High Temperature I_{DSS}
- High speed switching (lower $R_{DS(ON)} \times Q_{gd}$)

Schedule

- Mass production in Dec/2023

Product Spec

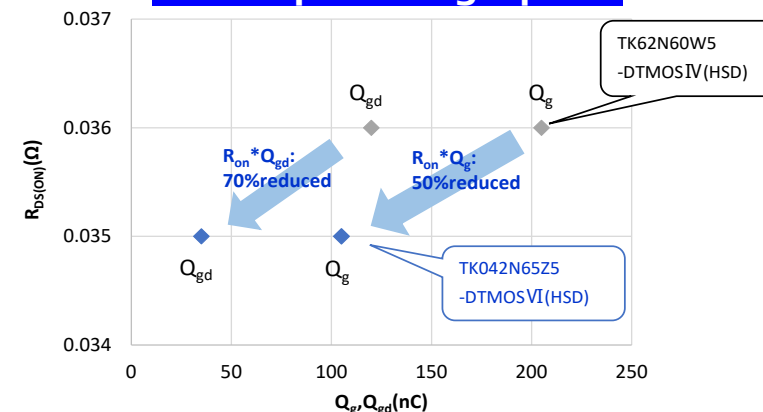
($T_a=25^\circ\text{C}$ unless otherwise specified)

Part number				TK042N65Z5	TK095N65Z5
Absolute Maximum Ratings	Drain-source breakdown voltage V_{DSS} (V)			650	650
	Drain current (DC) I_D (A)			55	29
	Channel temperature T_{ch} ($^\circ\text{C}$)			150	150
Electrical Characteristics	Drain-Source on-resistance $R_{DS(ON)}$ (m Ω)	$V_{GS}=10\text{V}$	max	42	95
		Total gate charge Q_g (nC)			typ. 105
	Gate-drain charge Q_{gd} (nC)			typ. 35	17
	Input capacitance C_{iss} (pF)			typ. 6280	3654
	Reverse recovery time t_{rr} (ns)			typ. 160	115
Package	Package name			TO-247	
	Size (mm)			typ. 15.9 \times 20.95、t=5.02	

Packaging

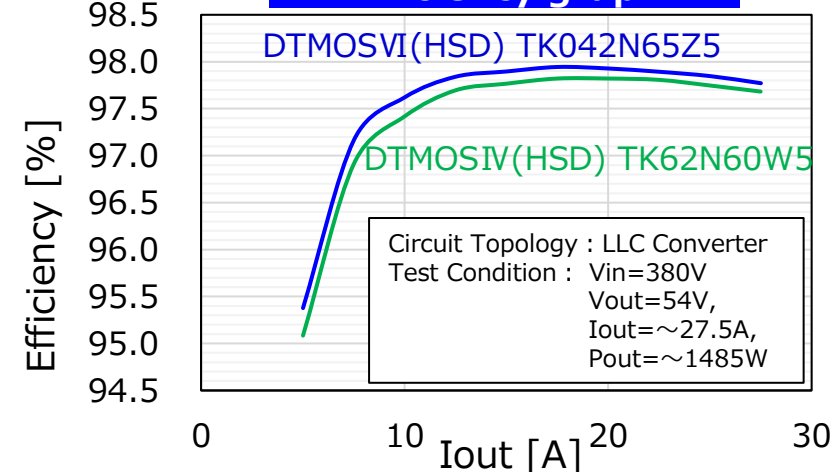


Comparison graph



TK62N60W5 Test Condition
 $R_{DS(ON)}$: $I_D=30.9\text{A}, V_{GS}=10\text{V}, Q_g, Q_{gd}$: $V_{DD}=400\text{V}, V_{GS}=10\text{V}, I_D=61.8\text{A}$
 TK042N65Z5 Test Condition
 $R_{DS(ON)}$: $I_D=27.5\text{A}, V_{GS}=10\text{V}, Q_g, Q_{gd}$: $V_{DD}=400\text{V}, V_{GS}=10\text{V}, I_D=55\text{A}$

Efficiency graph



Circuit Topology : LLC Converter
 Test Condition : $V_{in}=380\text{V}$
 $V_{out}=54\text{V}$,
 $I_{out}\sim 27.5\text{A}$,
 $P_{out}\sim 1485\text{W}$

Opto Device

Web Information

Application Notes -Points for photorelays in high frequency circuit applications

Photorelays have a variety of advantages, and replacement from mechanical relays is progressing, but there are some points that must be taken into consideration in comparison with mechanical relays when they are used in high-frequency circuits such as semiconductor testers and measuring instrument applications. In this notes, you can refer to such points.

[Click HERE ↓](#)



TLP3475W (NEW) High Frequency Characteristics

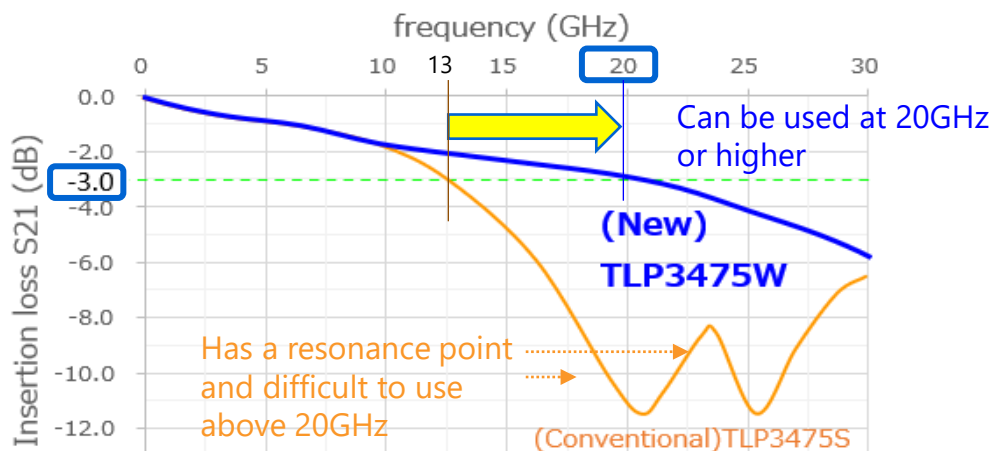
Main characteristics



Ta=25°C

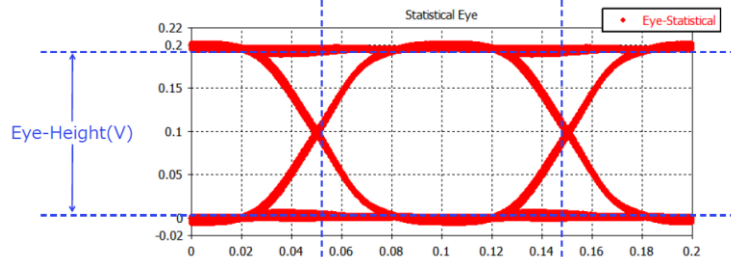
Product name		TLP3475W	TLP3475S
Package	Name	WSON4	S-VSON4
	Typ. size (mm)	1.45 × 2.0 × t0.8	1.45 × 2.0 × t1.65
Max. Rating	Off-stage voltage V _{OFF} (V)	60	60
	On-state current I _{ON} (A)	0.4	0.4
	Operating temperature T _{opr} (°C)	-40 to 110	-40 to 110
Elec. Characteristics	Insertion loss (frequency @ -3dB) typ.	20	13
	Off-state current I _{OFF} max (nA) (@V _{OFF})	1 (@50 V)	1 (@50 V)
	Output capacitance C _{OFF} typ. (pF)	12	12
	On-state resistance R _{ON} typ. (Ω)	1.1	1.1
Contact		1a	

(1) Pass-through characteristics (S-parameters)

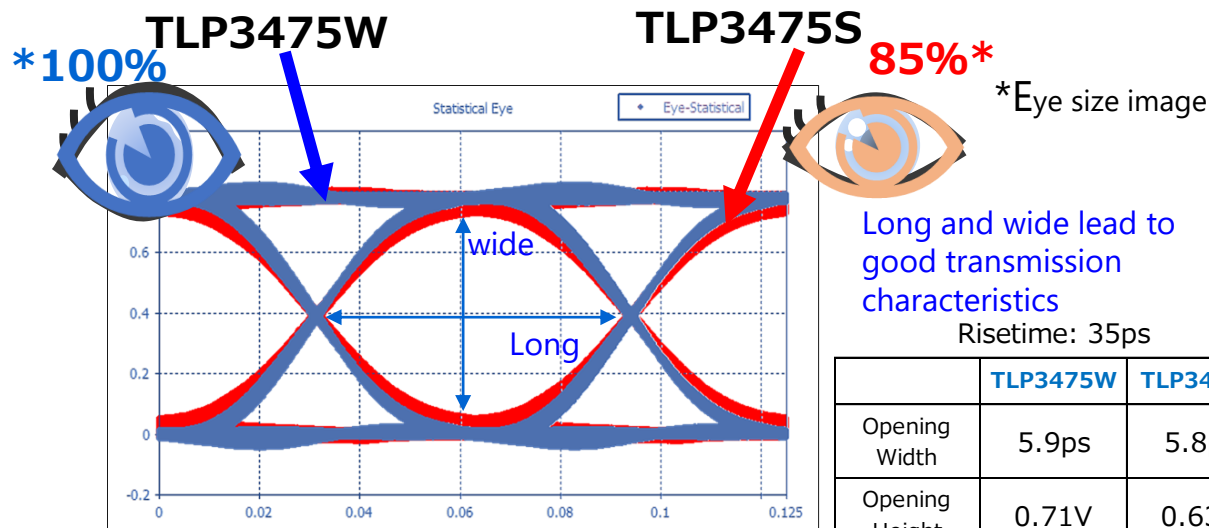


TLP3475W is better due to Less loss.

(2) Eye pattern (PCI Express 2.0 (Gen2) 16Gbps)



TLP3475W Data sheet [Click HERE ↓](#)



Calculate eye diagrams by using measured S-parameter data

TLP3475W is better due to longer and wider.

Sensor

Linear Image Sensor

New!! Information

★ Please click below to watch sensor product video.

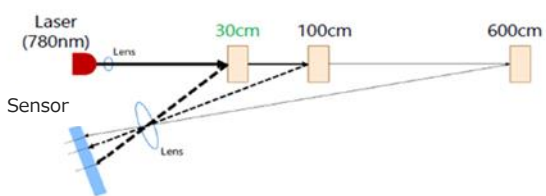
- Toshiba Web [Click here! !](#)
- YouTube <https://www.youtube.com/watch?v=OigLmFfo1jc>

High Intensity Resistant Sensor Chip "ET4KK0-S" for LDS*1

Strength

- High-speed
- High Intensity Resistant

>> Able to measure strong reflection light from short distance without overflow.



Application

- Robot Cleaner, Total Station etc.

Under Development (CY24/Q2 CS)

	TCD1254GFG	TCD1103GFG	ET4KK0-S
Pixel number	2,500	1,500	1,500
Pixel size (μm)	5.25 x 64	5.5 x 64	5.25 x 50
Data Rate (MAX,MHz)	2	2	10
Signal Output Polarity	-	-	+
Power Supply (V)	3.0-5.0	3.0-4.0	3.15-3.45
Power (MAX,mV)	60	48	105
Saturation Voltage (MIN,mV)	700	450	900
Package size (mm)	19.0 x 6.0 x 2.2 16pin GLCC	15.2 x 6.0 x 2.2 16pin GLCC	16.0 x 3.5 x 1.9 16pin GLCC*2
Additional Feature	Timing Generator Electronic Shutter	Timing Generator Electronic Shutter	Timing Generator Electronic Shutter Overflow Drain

*1 LDS : Laser Distance Sensor

*2 This product is sensor chip. Please contact us if you need a PKG version.