Featured Products

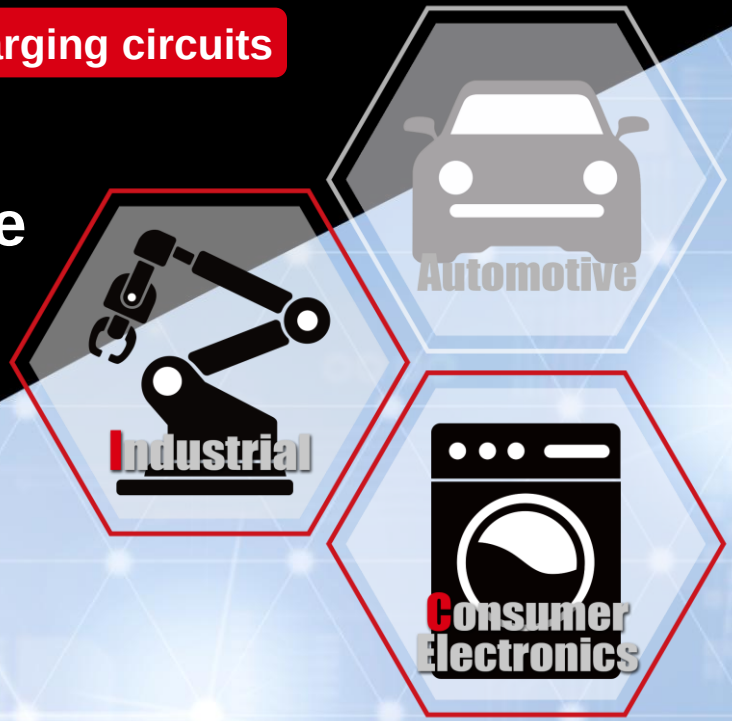
Electronics for the Future

ROHM SEMICONDUCTOR

Ideal for bidirectional circuit protection in fast charging circuits

Ultra-Compact・Low ON-Resistance 30V Nch MOSFET

AW2K21



Ultra-Compact Low ON-Resistance 30V Nch MOSFET Overview

The AW2K21 is a 30V Nch MOSFET that delivers ultra-low ON-resistance in an ultra-compact package. In addition to a common source circuit that shares the source of two MOSFETs to provide bidirectional circuit protection in a single package, this new product can be used as a single MOSFET by simply changing the pin connections.

Features

- **Achieves an industry-leading* ON-resistance of 2mΩ in an ultra-compact 2mm square size**

  Contributes to set miniaturization and energy efficiency with performance superior to equivalent GaN HEMTs

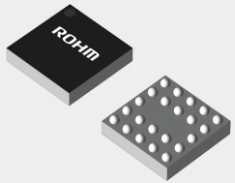
- **Common-source circuit enables bidirectional circuit protection with a single device**

  This significantly reduces component area vs conventional power delivery circuits requiring two MOSFETs, making it ideal for USB fast charging devices

- **Can also be used as a standard single MOSFET**

  An industry-leading* ON-resistance of 2mΩ (even as a single MOSFET) contributes to greater miniaturization and energy savings in applications such as load switches

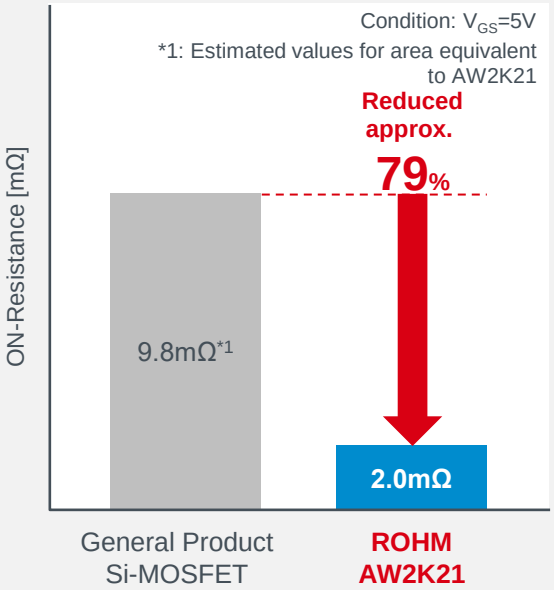
*ROHM April 2025 study



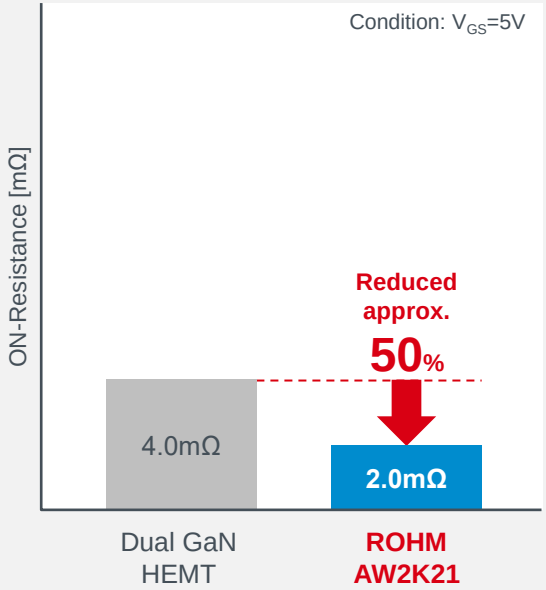
WLCSP2020
(2.0mm×2.0mm×0.55mm)

Achieves Industry-leading* ON-Resistance Despite the Ultra-Compact Size

ON-Resistance Comparison vs General Si-MOSFETs



ON-Resistance Comparison vs Equivalent Dual GaN HEMTs



Original structure significantly reduces ON-resistance, contributing to greater set miniaturization and energy savings

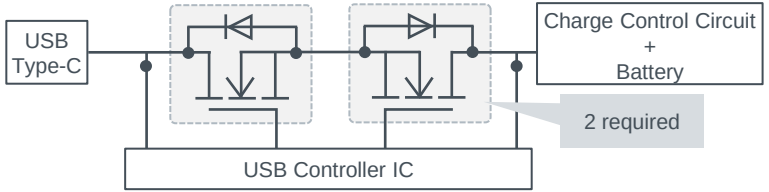
*ROHM April 2025 study

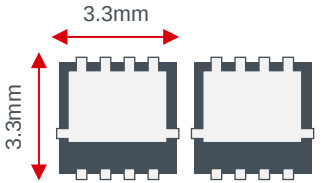
Common-Source Circuit Enables Bidirectional Circuit Protection with a Single MOSFET

Comparing General MOSFETs vs ROHM's AW2K21 When Used in Power Delivery Circuits

General MOSFET

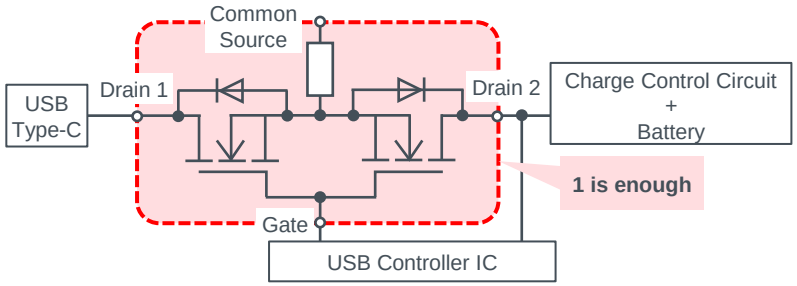
Power Delivery Circuit Example





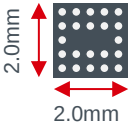
$R_{DD(on)}$ = 3.0mΩ
(1.5mΩ*1×2)

ROHM AW2K21



81% smaller component area

ON-resistance reduced approx. 33%



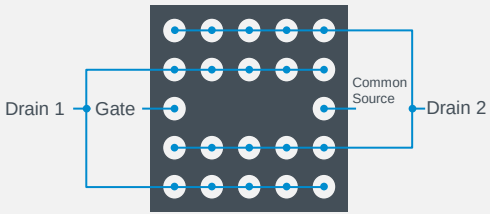
$R_{DD(on)}$ = 2.0mΩ*2

*1 : V_{GS}=4.5V, I_D=20A, Ta=25°C
*2 : V_{GS}=5.0V, I_D=20A, Ta=25°C

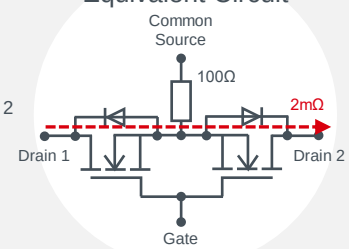
AW2K21 provides bidirectional circuit protection during power supply delivery with just a single component, reducing product size considerably
Contributes to the miniaturization of devices requiring fast charging

Can Also be Used as a Standard Single MOSFET

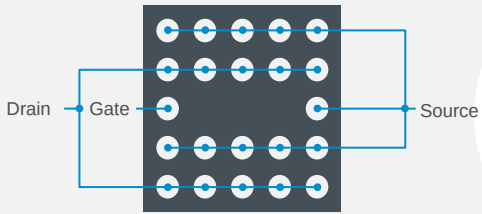
When used for bidirectional protection



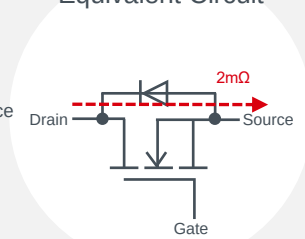
Equivalent Circuit



When used as a single MOSFET



Equivalent Circuit



Terminal settings allow operation as a single ultra-compact, ultra-low ON-resistance (2mΩ) MOSFET, contributing to greater miniaturization and energy efficiency in devices equipped with MOSFETs

■ Application Examples

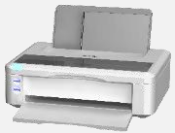
Suitable for applications requiring improved power savings in a compact size

- For use as a bidirectional protection MOSFET

  Optimized for fast-charging and battery protection circuits

- For use as a single MOSFET

  Ideal for load switches



Key Features of ROHM's Ultra-Compact Low ON-Resistance 30V Nch MOSFET

Part No.	Polarity [ch]	Configuration	Drain-Source Voltage V_{DDS}/V_{DSS} [V]	Gate-Source Voltage V_{GSS}[V]	Drain Current I_D[A]	Permissible Loss P_D[W]	$R_{DD(on)}/R_{DS(on)}$ [mΩ] V_{DS}=5.0V	Package [mm]
New **AW2K21**	N	Common Source/ Single	30	−0.2 to +10	20	1.6	2.0	WLCSP2020 2.0×2.0×0.55

Click on the icon to access the product page and the icon to view the datasheet on ROHM's website.

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