AP2904EC4

Halogen-Free Product

Advanced Power Electronics Corp.

DUAL N-CHANNEL ENHANCEMENT MODE POWER MOSFET

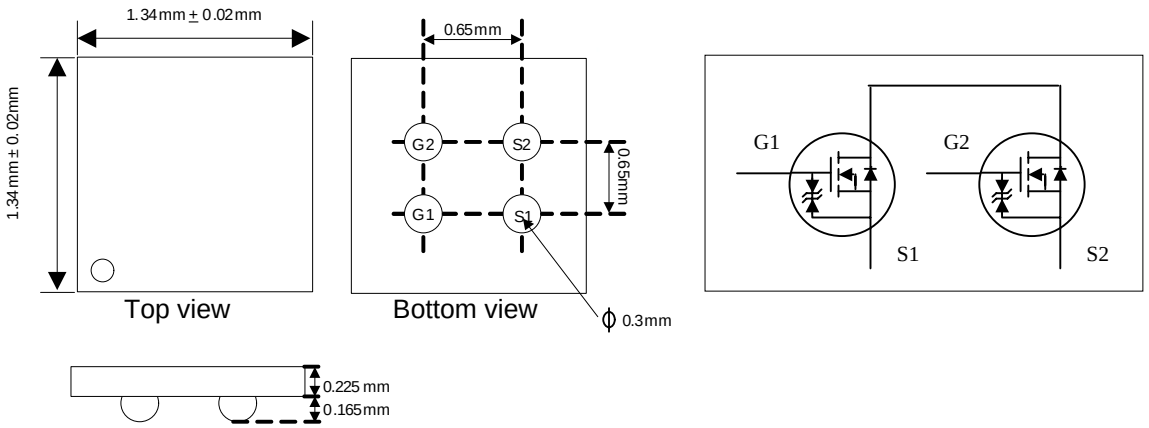
- **Capable of 2.5V Gate Drive**
- **Ultra-small Package Outline**
- **Protection Diode Built-in**
- **RoHS Compliant & Halogen-Free**

V_{SSS}	24V
$R_{SS(ON)}$	38mΩ
I_S	6A

Description

AP2904 series are from Advanced Power innovated design and silicon process technology to achieve the lowest possible on-resistance and fast switching performance. It provides the designer with an extreme efficient device for the load switch, charge switch, battery switch for portable application.

WLCSP 4 ball



Absolute Maximum Ratings@T_j=25°C(unless otherwise specified)

Symbol	Parameter	Rating	Units
V_{SSS}		24	V
V_{GSS}		±12	V
I_S	Source Current[3]	6	A
I_{SM}	Pulsed Source Current[1]	45	A
P_D@T_A=25℃	Total Power Dissipation[3]	1.25	W
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Junction Temperature	-55 to 150	℃

Electrical Characteristics@T_j=25°C(unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
$V(BR)_{SSS}$	Source-Source Breakdown Voltage	V_{GS}=0V, I_S=250uA	24	-	-	V
$R_{SS(ON)}$	Static Source-Source On-Resistance[2]	V_{GS}=4.5V, I_S=1A	23	29	38	mΩ
		V_{GS}=4V, I_S=1A	24	30	39	mΩ
		V_{GS}=3.1V, I_S=1A	26	33	44	mΩ
		V_{GS}=2.5V, I_S=1A	30	37	49	mΩ
$V_{GS(off)}$	Cutoff Voltage	V_{SS}=10V, I_S=1mA	0.4	-	1.3	V
｜yfs｜	Forward Transfer Admittance	V_{SS}=5V, I_S=2.25A	-	15	-	S
I_{SSS}	Zero Gate Voltage Source Current	V_{SS}=20V, V_{GS}=0V	-	-	10	uA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±12V, V_{SS}=0V	-	-	±30	uA
$t_{d(on)}$	Turn-on Delay Time	V_{SS}=20V	-	1	-	us
t_r	Rise Time	I_S=2.25A	-	5	-	us
$t_{d(off)}$	Turn-off Delay Time	V_{GS}=4V	-	12	-	us
t_f	Fall Time		-	8	-	us
Q_g	Total Gate Charge	V_{SS}=20V, V_{GS}=4V, I_S=4.5A	-	13	-	nC
$V_{F(S-S)}$	Forward Source-Source Voltage[2]	I_S=1.5A, V_{GS}=0V	-	-	1.2	V

Notes:

1.Pulse width limited by Max. junction temperature.

2.Pulse test

3.Surface mounted on 1 in^2 2oz copper pad of FR4 board, t ≤ 5s

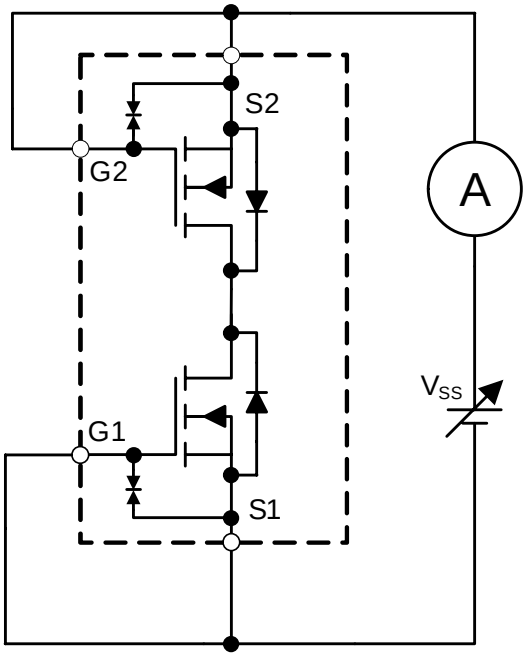
THIS PRODUCT IS SENSITIVE TO ELECTROSTATIC DISCHARGE, PLEASE HANDLE WITH CAUTION.

USE OF THIS PRODUCT AS A CRITICAL COMPONENT IN LIFE SUPPORT OR OTHER SIMILAR SYSTEMS IS NOT AUTHORIZED.

APEC DOES NOT ASSUME ANY LIABILITY ARISING OUT OF THE APPLICATION OR USE OF ANY PRODUCT OR CIRCUIT DESCRIBED HEREIN; NEITHER DOES IT CONVEY ANY LICENSE UNDER ITS PATENT RIGHTS, NOR THE RIGHTS OF OTHERS.

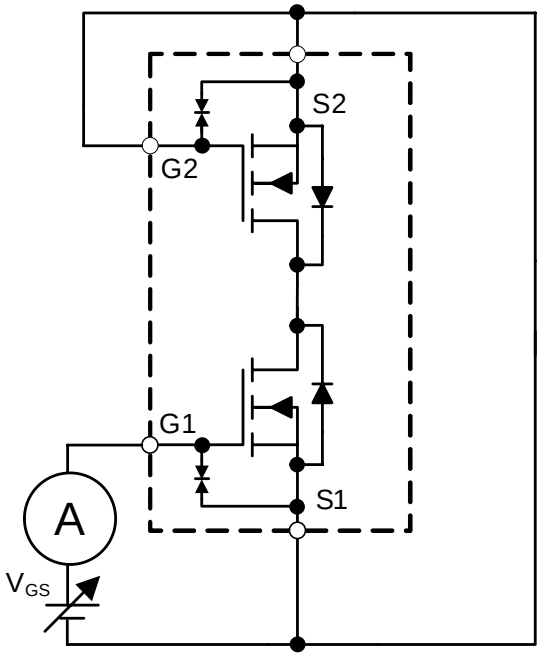
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Test Circuits are Example of Measuring Channel-1 (unless otherwise specified)



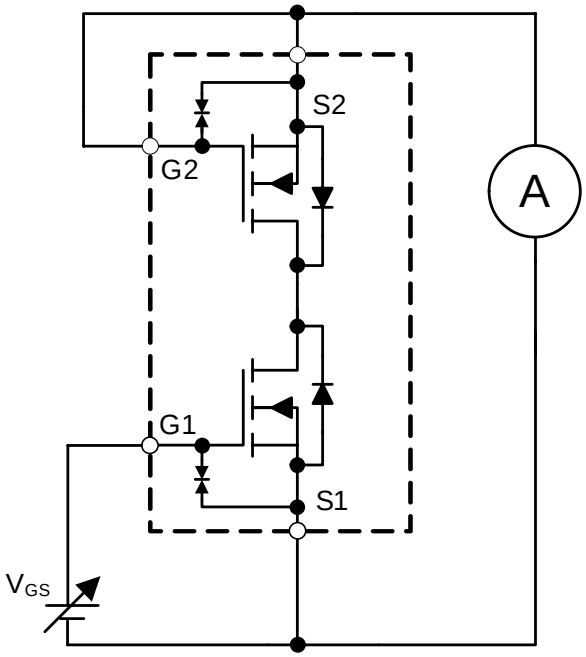
TEST CIRCUIT : I_{SSS}

When Ch-1 is measured, Gate and Source of Ch-2 are short-circuitd.

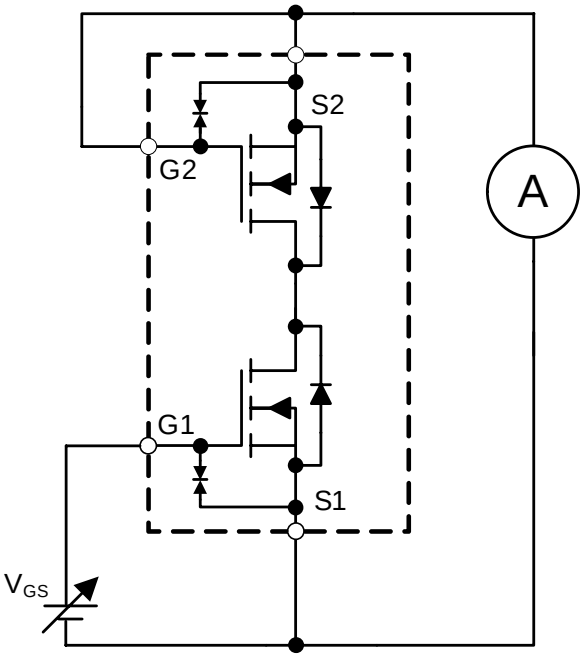


TEST CIRCUIT : I_{GSS}

When Ch-1 is measured, Gate and Source of Ch-2 are short-circuitd.

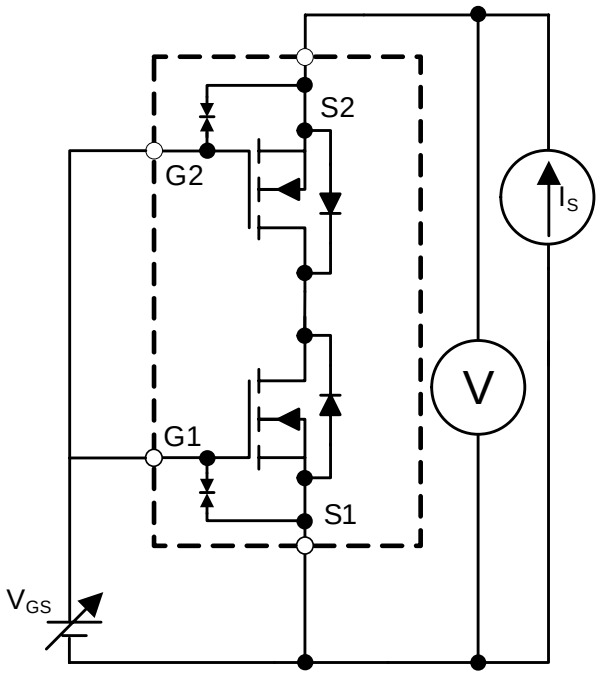


TEST CIRCUIT : V_{GS}(off)



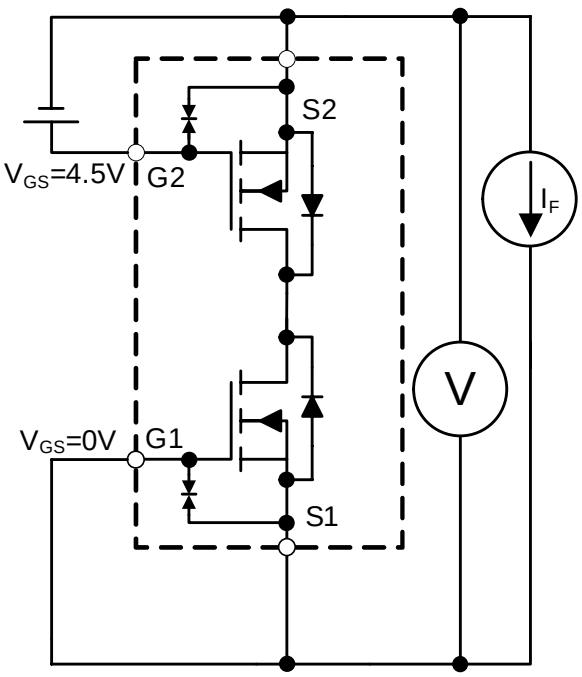
TEST CIRCUIT : ｜yfs｜

Test Circuits are Example of Measuring Channel-1(unless otherwise specified)



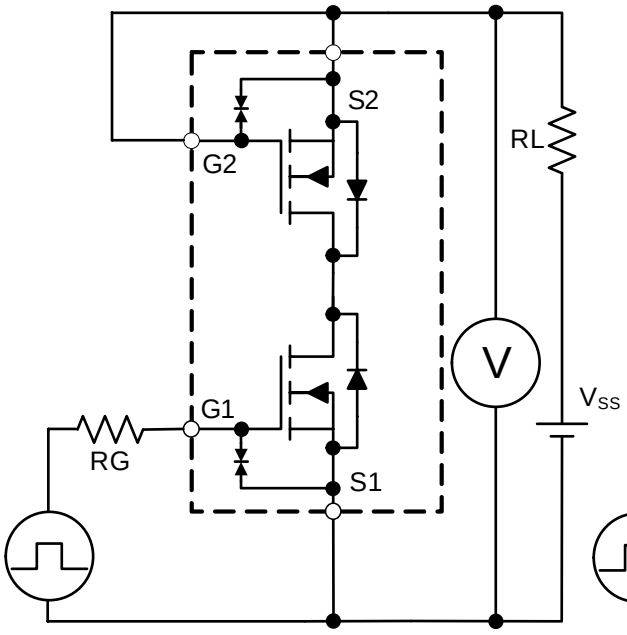
TEST CIRCUIT : $R_{SS(ON)}$

When Ch-1 is measured, +4.5V is added to V_{GS} of Ch-2



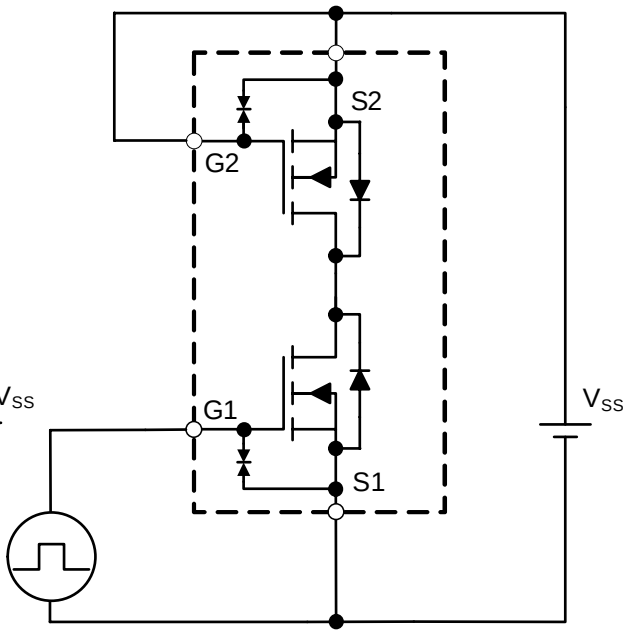
TEST CIRCUIT : $V_{F(S-S)}$

When Ch-1 is measured, Gate and Source of Ch-2 are short-circuitd.



TEST CIRCUIT : Switching Time

When Ch-1 is measured, Gate and Source of Ch-2 are short-circuitd.



TEST CIRCUIT : Gate Charge

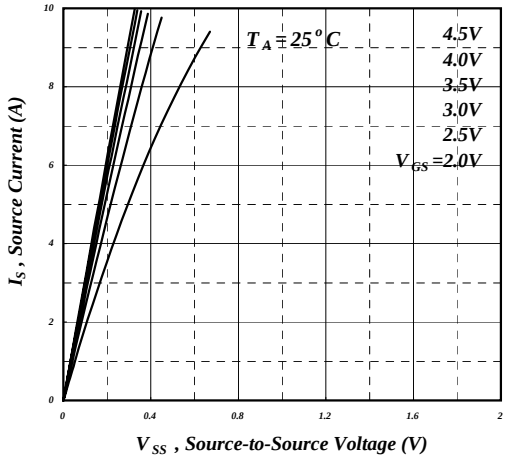


Fig 1. Typical Output Characteristics

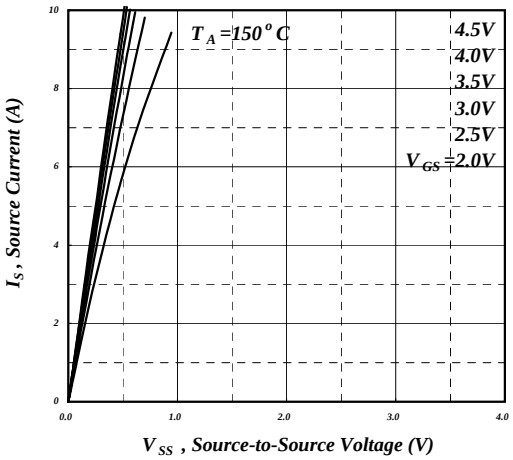


Fig 2. Typical Output Characteristics

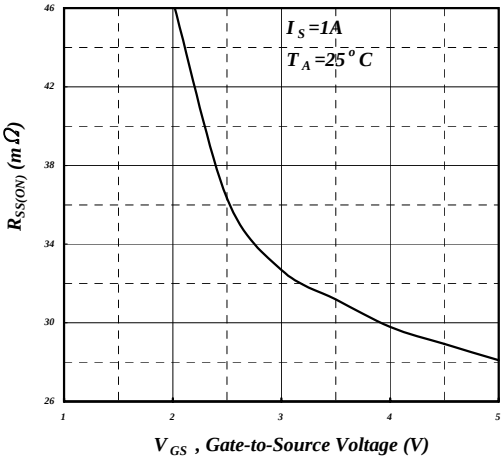


Fig 3. Static Source-to-Source On-Resistance v.s. Gate Voltage

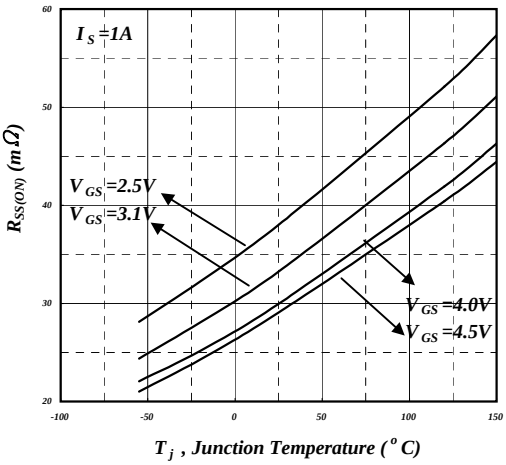


Fig 4. Typ. Source-to-Source on State Resistance v.s. Junction Temperature

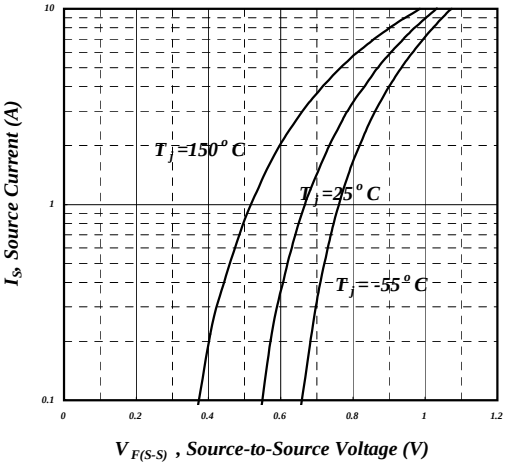


Fig 5. Forward Characteristic of Reverse Diode

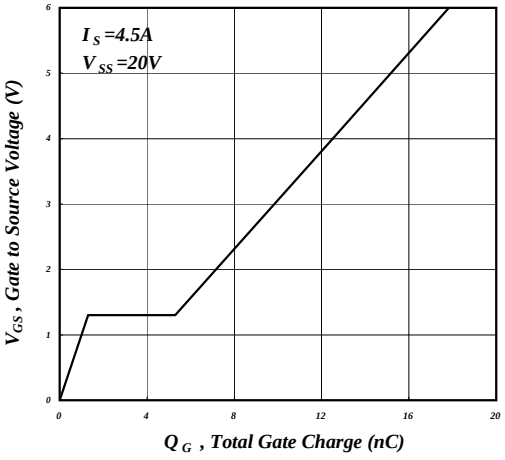


Fig 6. Gate Charge Characteristics

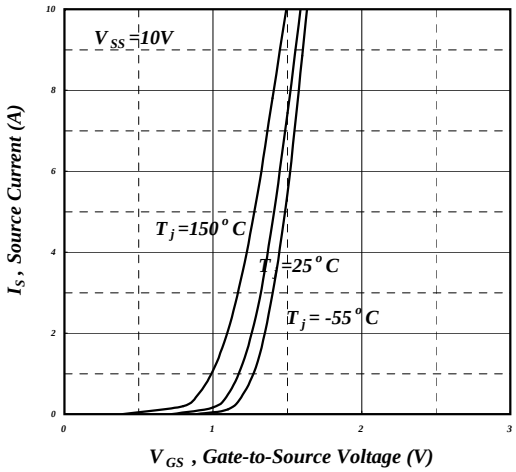


Fig 7. Transfer Characteristics

MARKING INFORMATION

