AP2904EC4

Halogen-Free Product

Advanced Power Electronics Corp.

DUAL N-CHANNEL ENHANCEMENT MODE POWER MOSFET

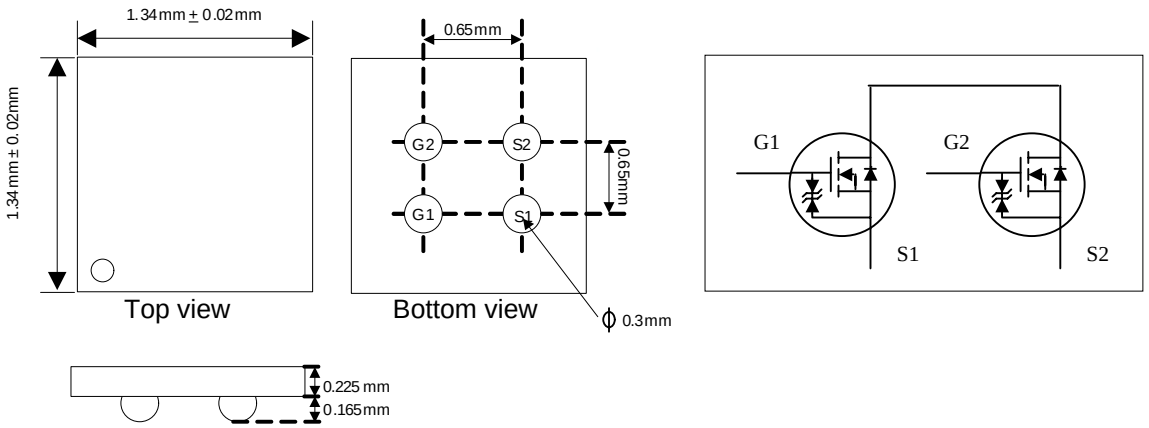
- **Capable of 2.5V Gate Drive**
- **Ultra-small Package Outline**
- **Protection Diode Built-in**
- **RoHS Compliant & Halogen-Free**

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

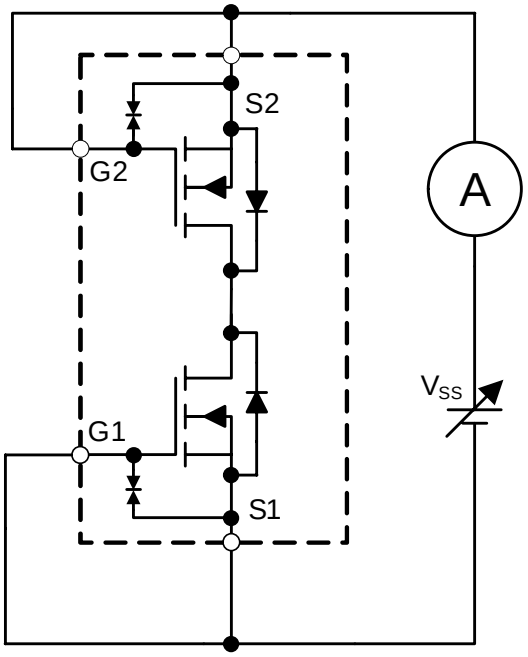
Notes:

1.Pulse width limited by Max. junction temperature.

2.Pulse test

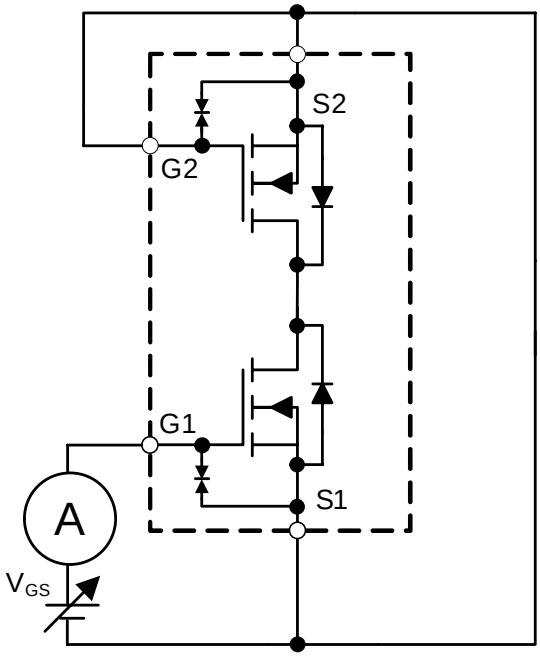
3.Surface mounted on 1 in^2 2oz copper pad of FR4 board, t ≤ 5s

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



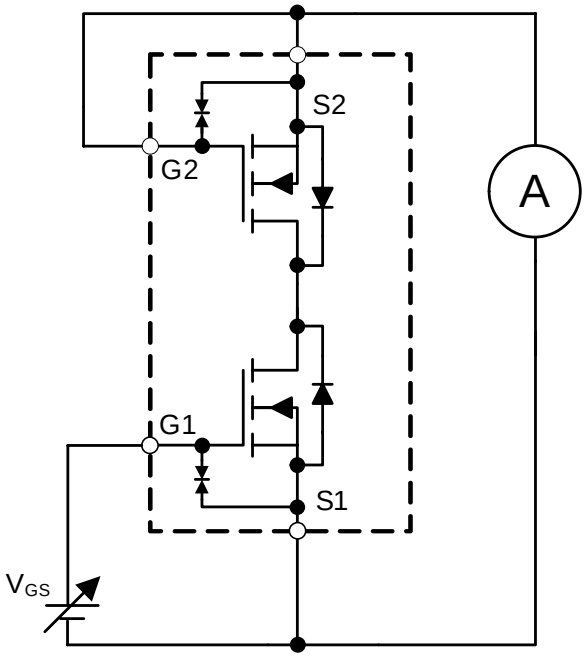
TEST CIRCUIT : I_{SSS}

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

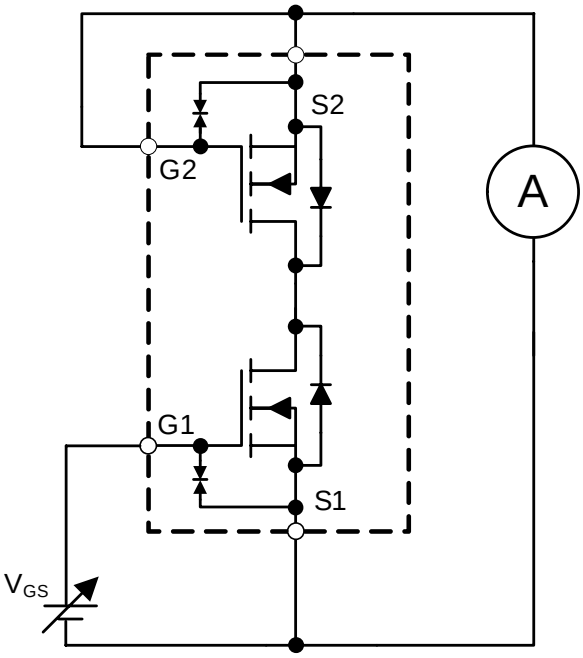


TEST CIRCUIT : I_{GSS}

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

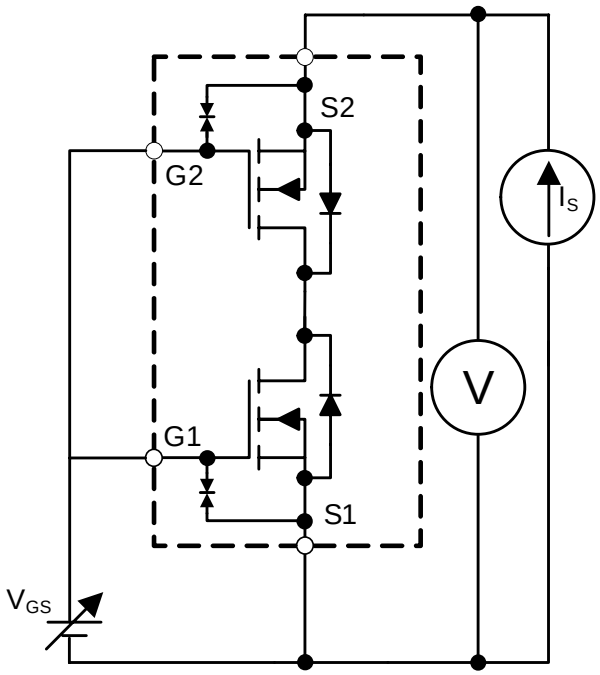


TEST CIRCUIT : V_{GS}(off)



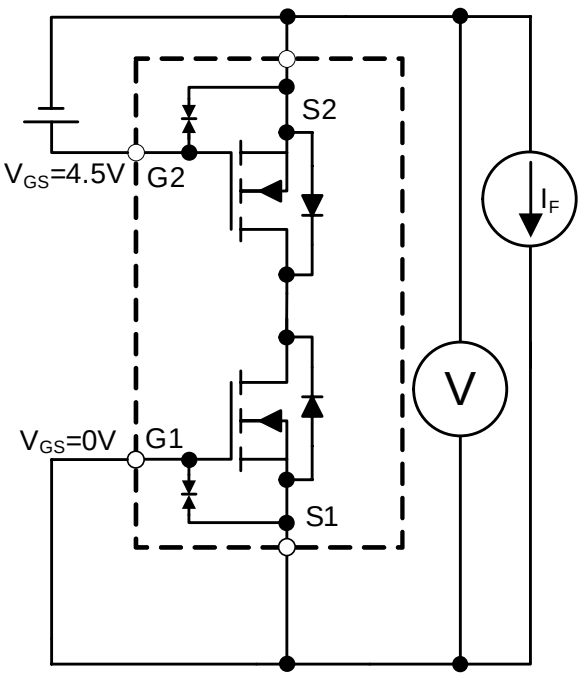
TEST CIRCUIT : ｜yfs｜

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



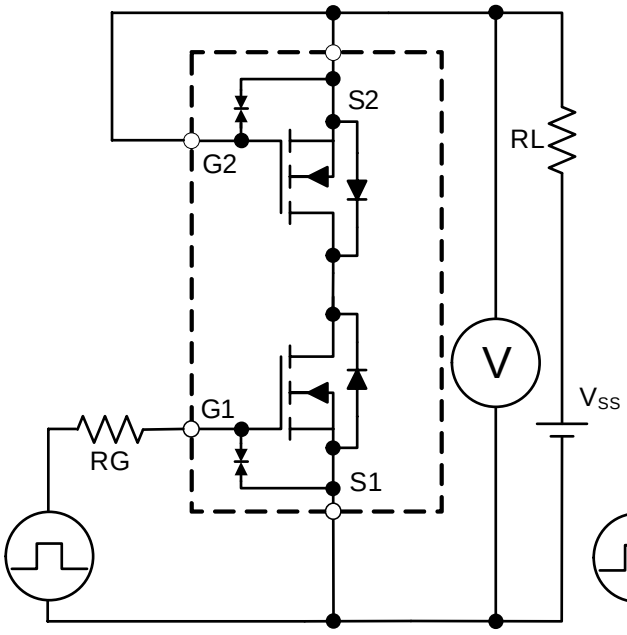
TEST CIRCUIT : $R_{SS(ON)}$

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



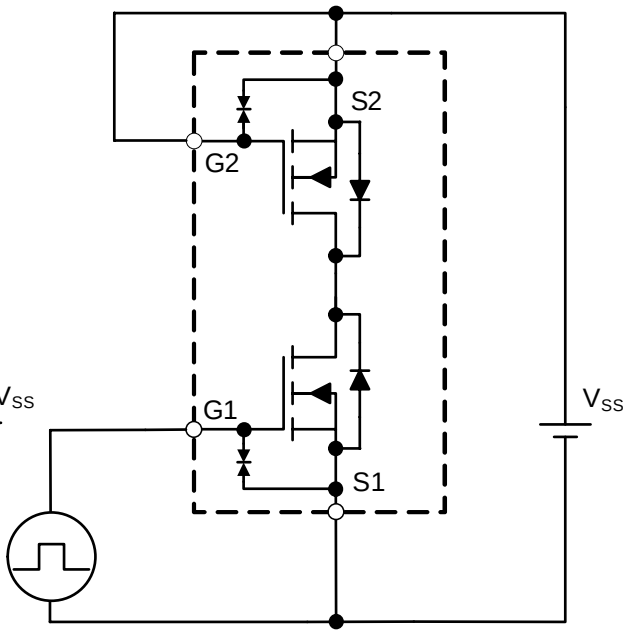
TEST CIRCUIT : $V_{F(S-S)}$

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

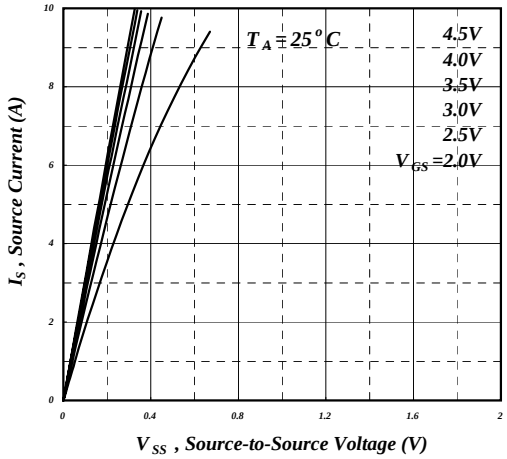


Fig 1. Typical Output Characteristics

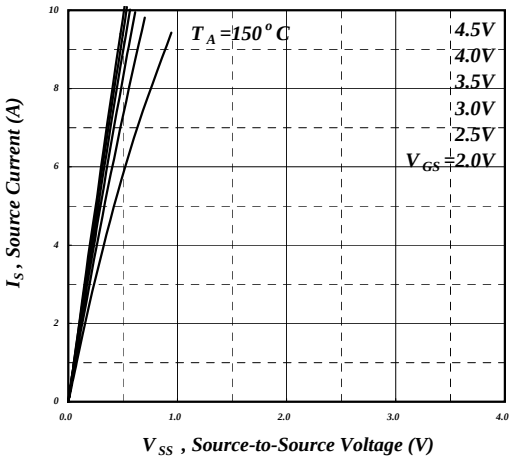


Fig 2. Typical Output Characteristics

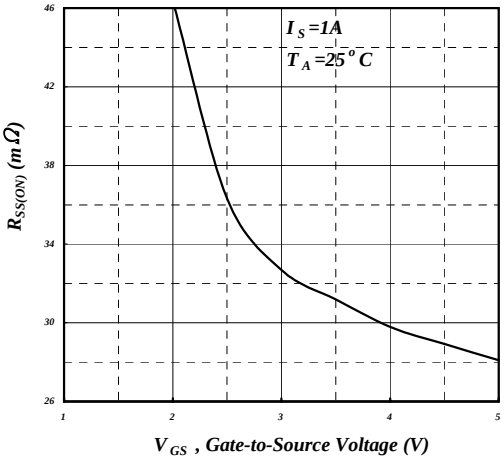


Fig 3. Static Source-to-Source On-Resistance v.s. Gate Voltage

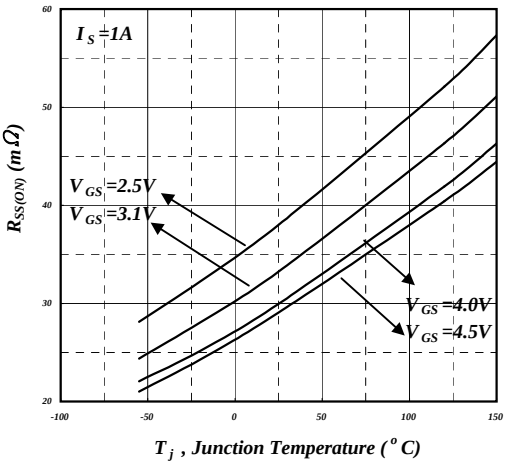


Fig 4. Typ. Source-to-Source on State Resistance v.s. Junction Temperature

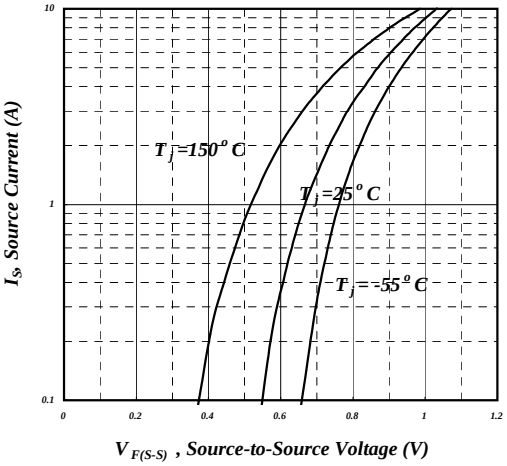


Fig 5. Forward Characteristic of Reverse Diode

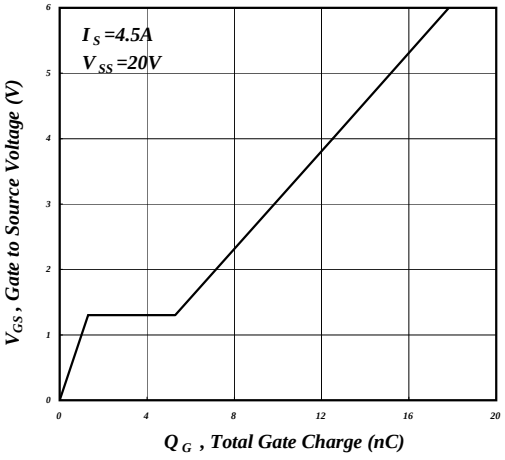


Fig 6. Gate Charge Characteristics

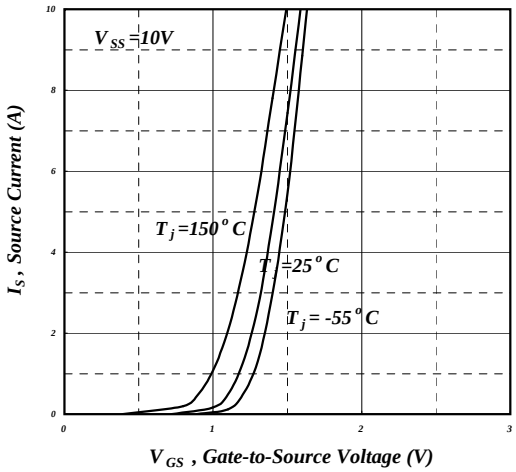


Fig 7. Transfer Characteristics

MARKING INFORMATION