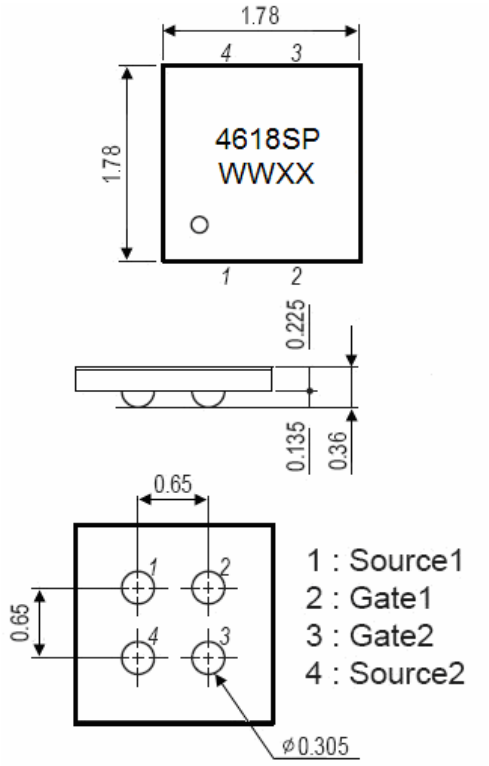
NCE Common-Drain Dual N-Channel Enhancement Mode Field Effect Transistor

Description

The NCE4618SP uses advanced trench technology to provide excellent $R_{SS(ON)}$, low gate charge and operation with gate voltages as low as 2.5V while retaining a 12V $V_{GS(MAX)}$ rating. It is ESD protected. This device is suitable for use as a unidirectional or bi-directional load switch, facilitated by its common-drain configuration.

Package Dimensions

Unit : mm



General Features

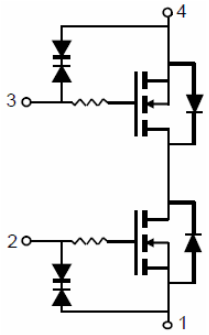
- V_{SSS} =24V,I_S =6A
- 2.5V drive
- Common-drain type
- 2KV HBM

Package Information

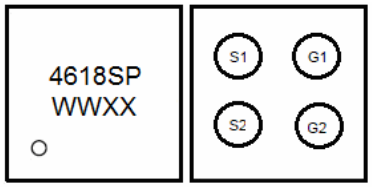
- Minimum Packing Quantity : 5,000 pcs./reel

Application

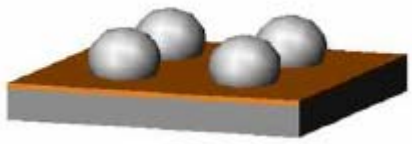
- Lithium-ion battery charging and discharging switch



Equivalent Circuit



Marking and pin assignment



CSP top view

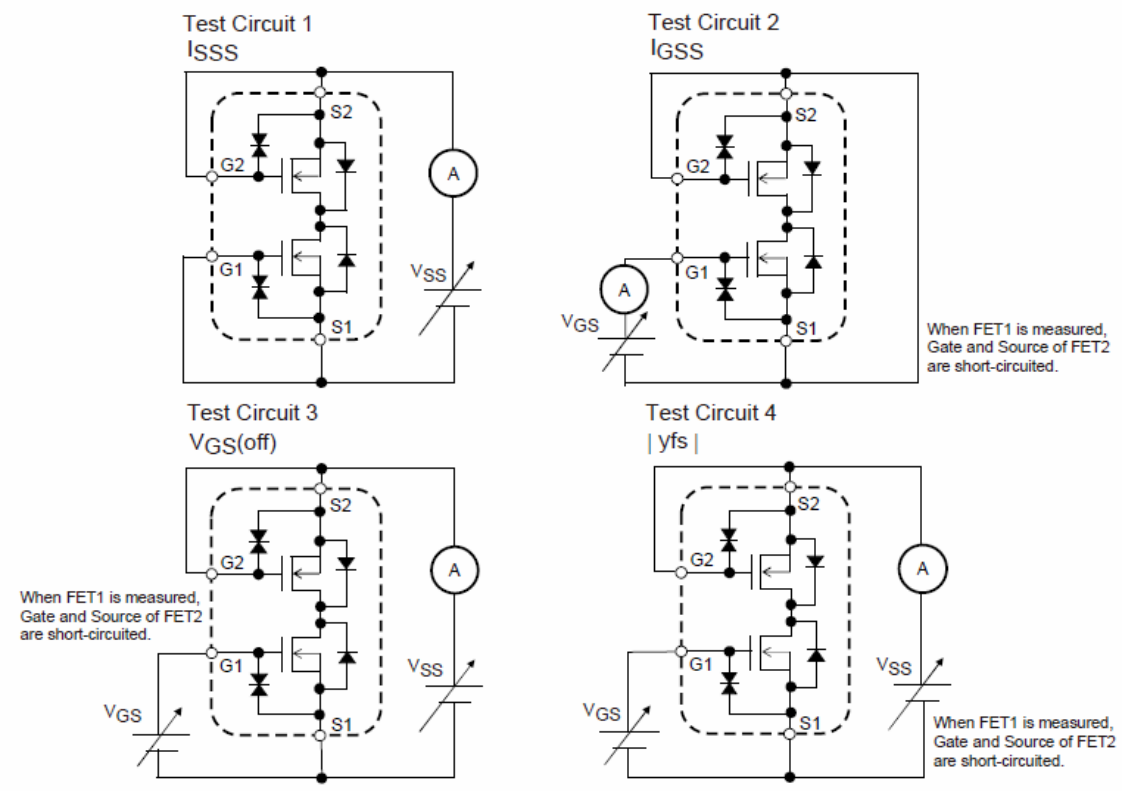
Absolute Maximum Ratings (T_A =25℃unless otherwise noted)

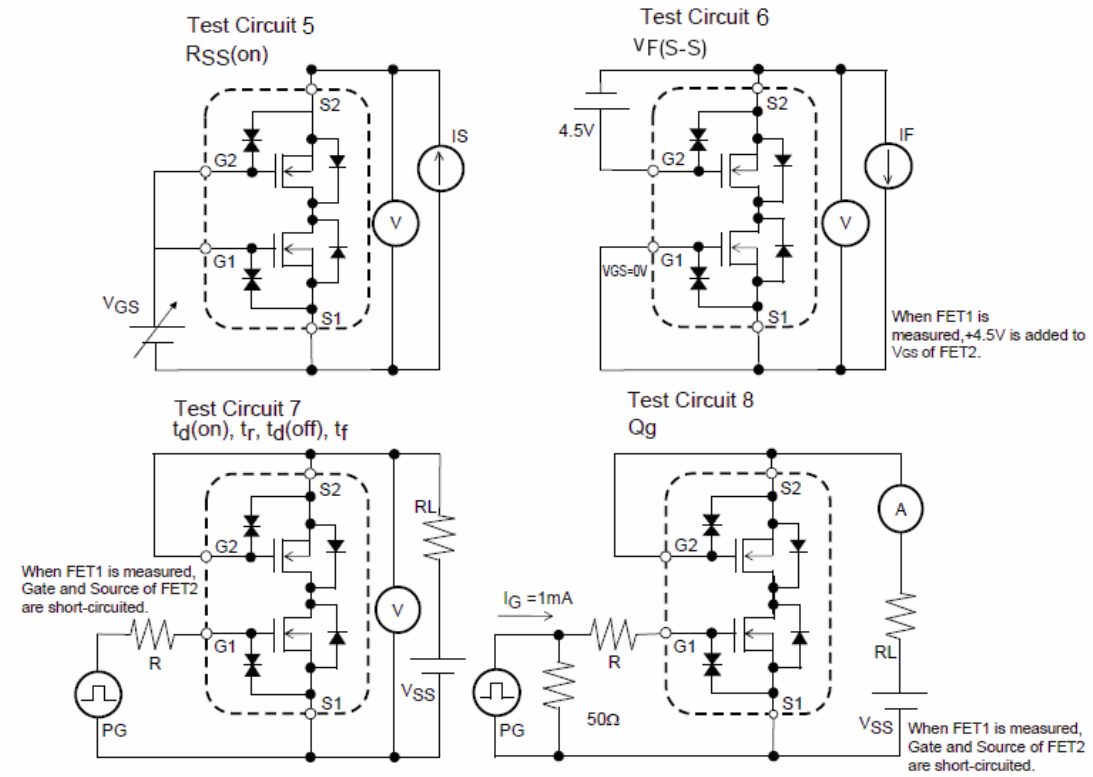
Symbol	Parameter	Limit	Unit
V_{SSS}	Source to Source Voltage	24	V
V_{GSS}	Gate-Source Voltage	±12	V
I_S	Source Current(DC)	6	A
I_{SP}	Source Current (Pulse)	60	A
P_T	Total Dissipation	1.6	W
Tch	Channel Temperature	150	℃
T_{STG}	Storage Temperature	-55 To 150	℃

Electrical Characteristics (T_A=25℃unless otherwise noted)

Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Parameters						
BV_{SSS}	Source to Source Breakdown Voltage	I_S=1mA, V_{GS}=0V, Test Circuit 1	24	-	-	V
I_{SSS}	Zero- Gate Voltage Source Current	VSS=20V, VGS=0V, Test Circuit 1	-	-	1	μA
I_{GSS}	Gate to Source Leakage Current	VSS=0V, VGS= ±8V, Test Circuit 2	-	-	±1	μA
$V_{GS(off)}$	Cutoff Voltage	VSS=10V, I_S=1mA, Test Circuit 3	0.5	0.83	1.3	V
$\|yg_{FS}\|$	Forward Transfer Admittance	V_{SS}=10V,I_S=3A, Test Circuit 4	6.5	-	-	S
$R_{SS(on)}$	Static Source to Source On-Resistance	V_{GS}=4.5V,I_S=3A, Test Circuit 5		18.3	21.5	mΩ
		V_{GS}=4.0V,I_S=3A, Test Circuit 5		19	22.5	mΩ
		V_{GS}=3.7V,I_S=3A, Test Circuit 5		19.3	24	mΩ
		V_{GS}=3.1V,I_S=3A, Test Circuit 5		20.3	27	mΩ
		V_{GS}=2.5V,I_S=3A, Test Circuit 5		23.0	32	mΩ
$t_{d(on)}$	Turn-on Delay Time	V_{SS}=10V,I_S=3A V_{GS}=4.5V Test Circuit 7	-	15	-	nS
t_r	Turn-on Rise Time		-	50	-	nS
$t_{d(off)}$	Turn-Off Delay Time		-	40	-	nS
t_f	Turn-Off Fall Time		-	55	-	nS
Q_g	Total Gate Charge	V_{SS}=10V,I_S=6A,V_{GS}=4.5V Test Circuit 8	-	25.4	-	nC
$V_{F(S-S)}$	Diode Forward Voltage	V_{GS}=0V,I_S=6A	-	-	1.2	V

Test Circuit





Typical Electrical and Thermal Characteristics (Curves)

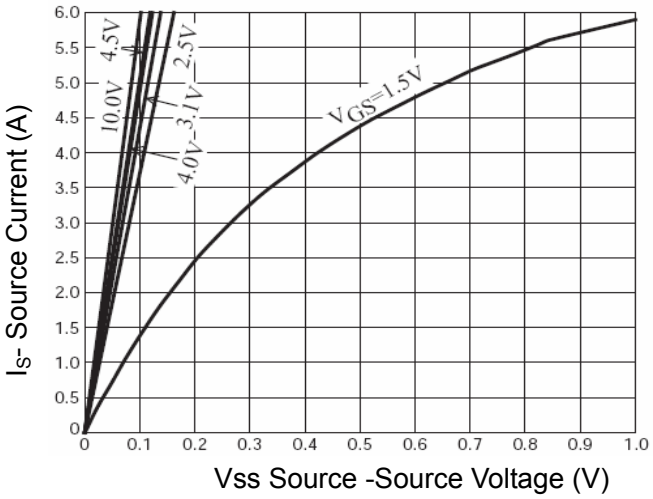


Figure 1 On-Region Characteristics

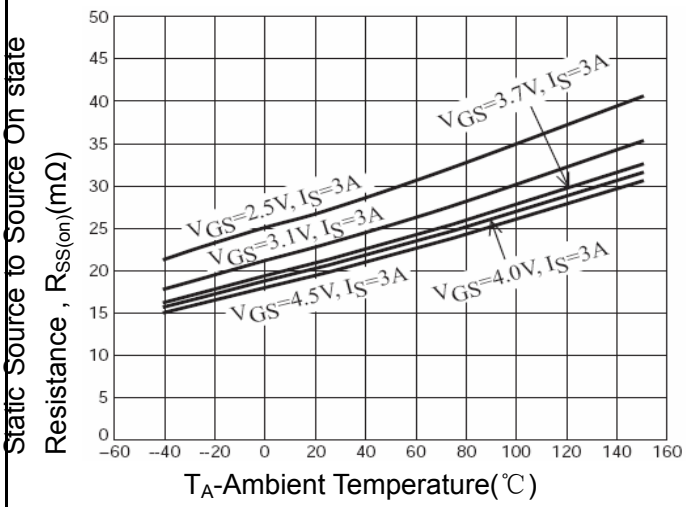


Figure 4 Rss(on)- Ambient Temperature

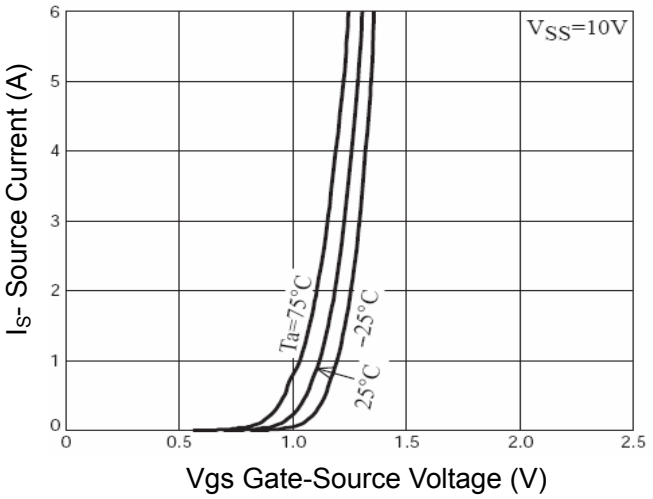


Figure 2 Transfer Characteristics

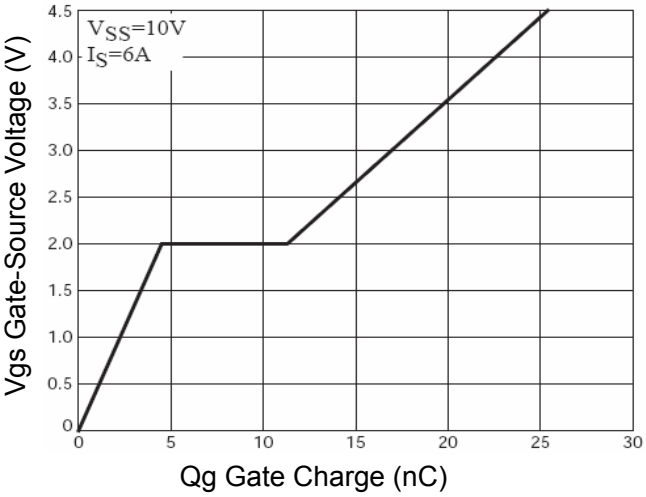


Figure 5 Gate Charge

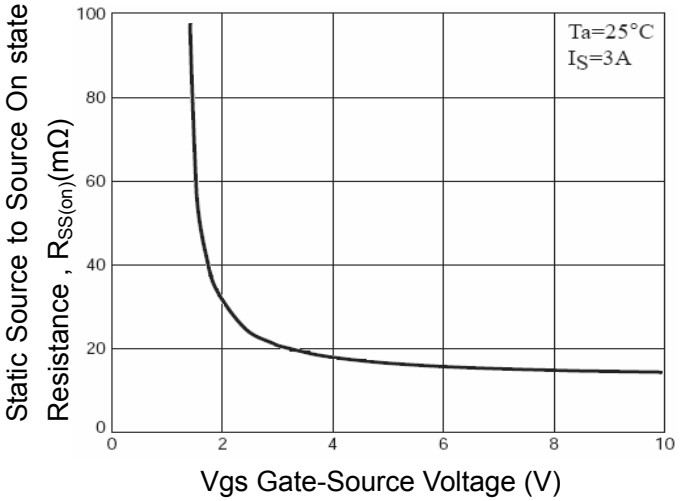


Figure3 On-Resistance-Gate-Source Voltage

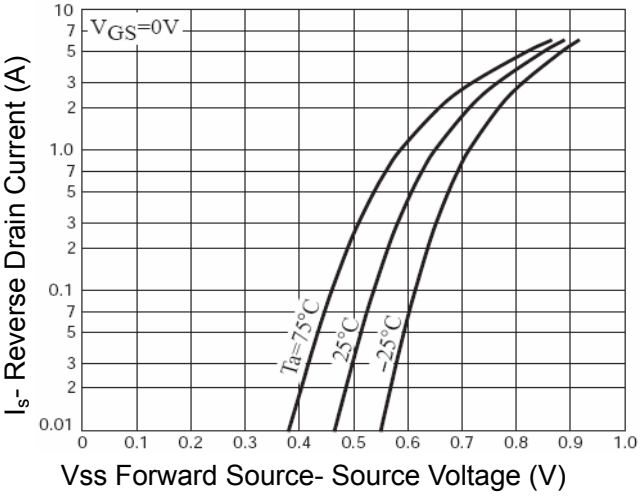


Figure 6 Body-Diode Characteristics

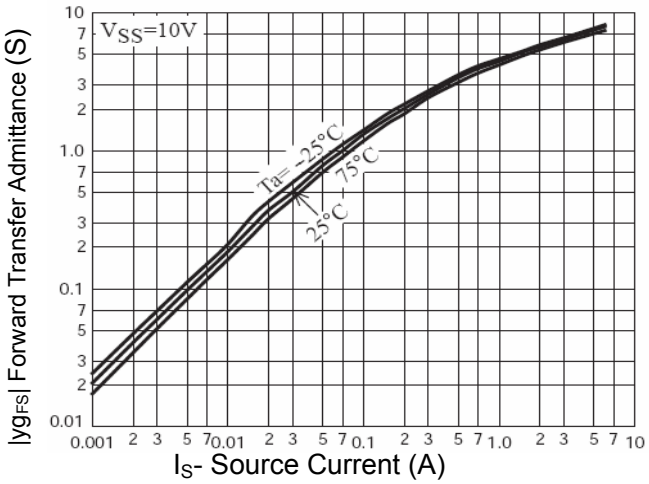


Figure7 |yfs|-- I_S

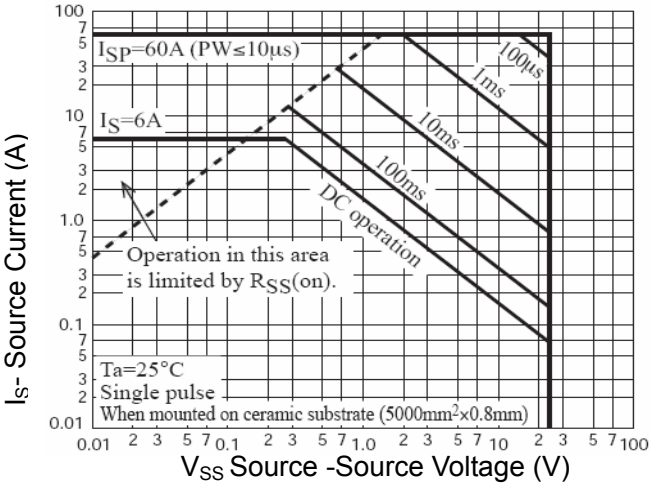


Figure 8 Safe Operation Area

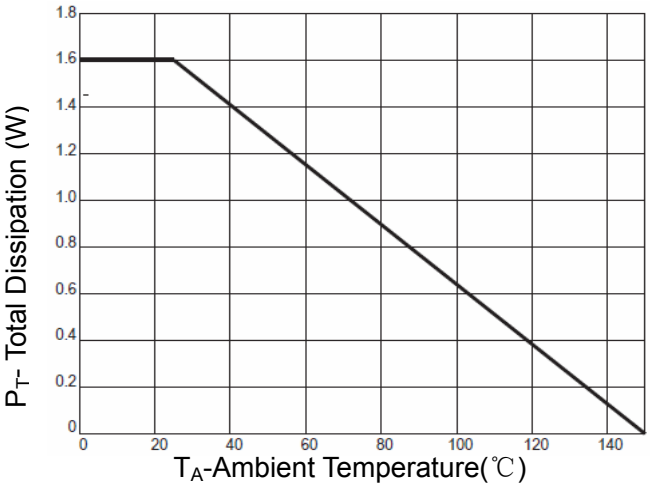


Figure 9 P_T Dissipation De-rating

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