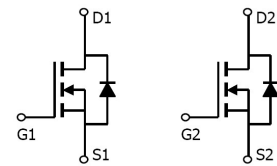


Feature

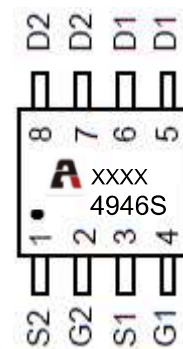
- 60V,5A
 $R_{DS(on)} < 35m\Omega @ V_{GS}=10V$
 $R_{DS(on)} < 42m\Omega @ V_{GS}=4.5V$
- Trench DMOS Power MOSFET
- Fast Switching
- Exceptional on-resistance and maximum DC current capability



Schematic diagram

Application

- DC/DC Converter
- Load Switch for Portable Devices
- Battery Switch



Marking and pin assignment

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity (PCS)
4946S	AP4946S	SOP-8	13 inch	-	4000

ABSOLUTE MAXIMUM RATINGS ($T_a=25^{\circ}C$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ($T_a = 25^{\circ}C$)	I_D	5	A
Continuous Drain Current ($T_a = 100^{\circ}C$)	I_D	3.5	A
Pulsed Drain Current ⁽¹⁾	I_{DM}	24	A
Power Dissipation	P_D	2	W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	62.5	$^{\circ}C/W$
Junction Temperature	T_J	150	$^{\circ}C$
Storage Temperature	T_{STG}	-55~ +150	$^{\circ}C$

MOSFET ELECTRICAL CHARACTERISTICS(T_a=25°C unless otherwise noted)

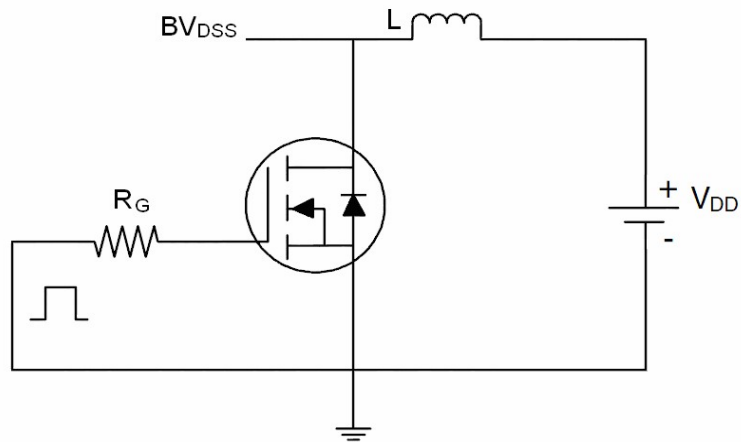
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D =250μA	60	-	-	V
Zero gate voltage drain current	I _{DSS}	V _{DS} =60V, V _{GS} = 0V	-	-	1	μA
Gate-body leakage current	I _{GSS}	V _{GS} =±20V, V _{DS} = 0V	-	-	±100	nA
Gate threshold voltage ⁽²⁾	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1	1.6	2.5	V
Drain-source on-resistance ⁽²⁾	R _{DS(on)}	V _{GS} =10V, I _D =5A	-	30	35	mΩ
		V _{GS} =4.5V, I _D =3A	-	36	42	
Dynamic characteristics						
Input Capacitance	C _{iss}	V _{DS} =30V, V _{GS} =0V, f =1MHz	-	979	-	pF
Output Capacitance	C _{oss}		-	120	-	
Reverse Transfer Capacitance	C _{rss}		-	100	-	
Switching characteristics						
Turn-on delay time	t _{d(on)}	V _{DD} =30V, R _L =1.5Ω V _{GS} =10V, R _G =3Ω	-	5.2	-	ns
Turn-on rise time	t _r		-	3	-	
Turn-off delay time	t _{d(off)}		-	17	-	
Turn-off fall time	t _f		-	2.5	-	
Total Gate Charge	Q _g	V _{DS} =30V, I _D =5A, V _{GS} =10V	-	22	-	nC
Gate-Source Charge	Q _{gs}		-	3.2	-	
Gate-Drain Charge	Q _{gd}		-	5.2	-	
Source-Drain Diode characteristics						
Diode Forward voltage ⁽²⁾	V _{DS}	V _{GS} =0V, I _S =5A	-	-	1.2	V
Diode Forward current ⁽³⁾	I _S		-	-	5	A

Notes:

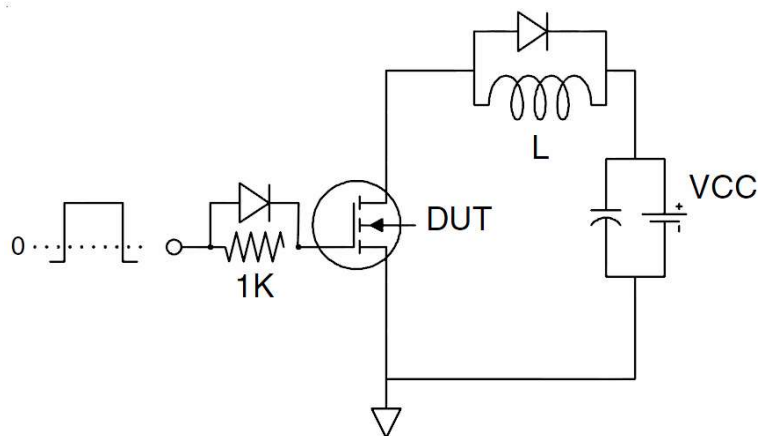
1. Repetitive Rating: pulse width limited by maximum junction temperature
2. Pulse Test: pulse width≤300μs, duty cycle≤2%
3. Surface Mounted on FR4 Board,t≤10 sec

Test Circuit

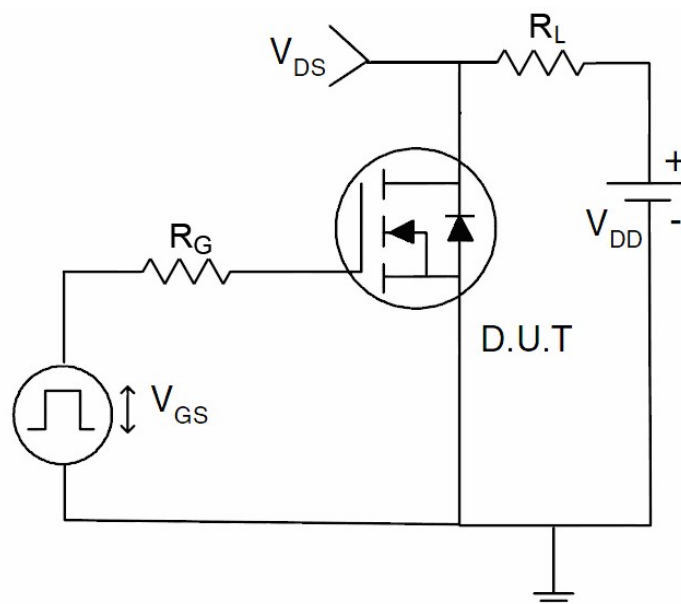
1) E_{AS} test Circuit



2) Gate charge test Circuit



3) Switch Time Test Circuit



Typical Electrical and Thermal Characteristics (Curves)

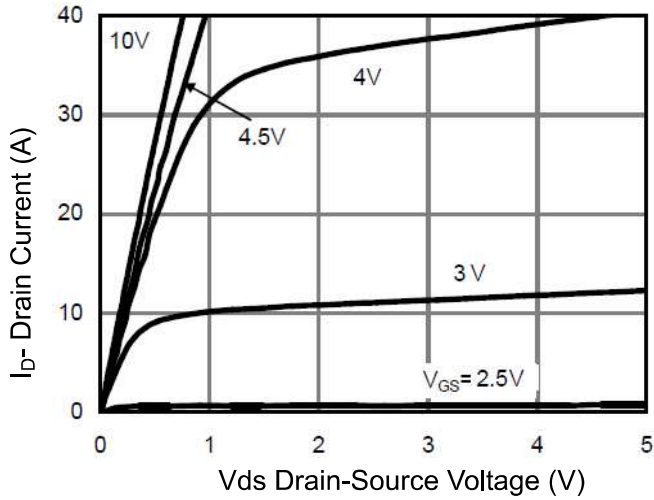


Figure 1 Output Characteristics

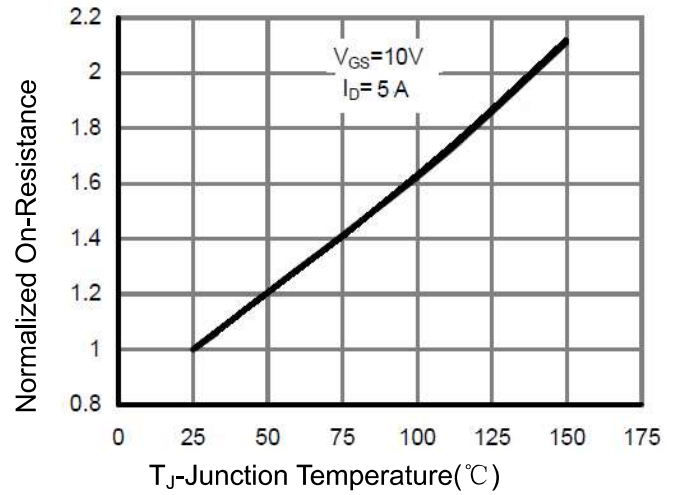


Figure 4 Rdson-Junction Temperature

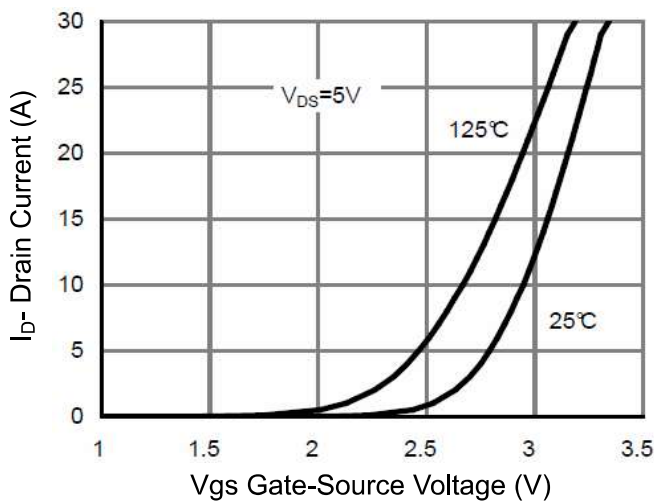


Figure 2 Transfer Characteristics

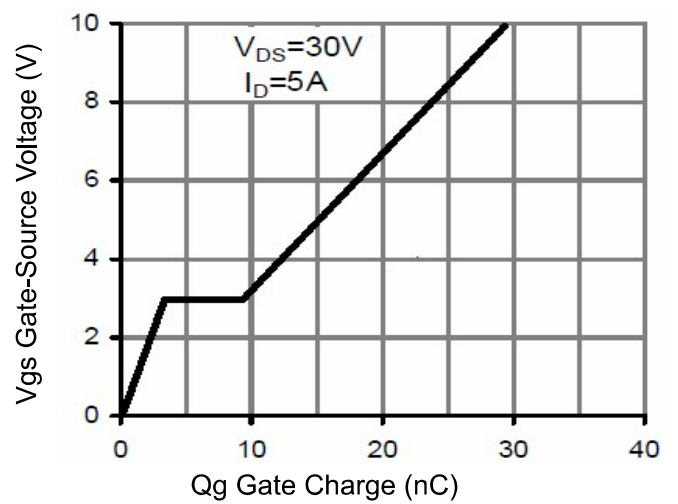


Figure 5 Gate Charge

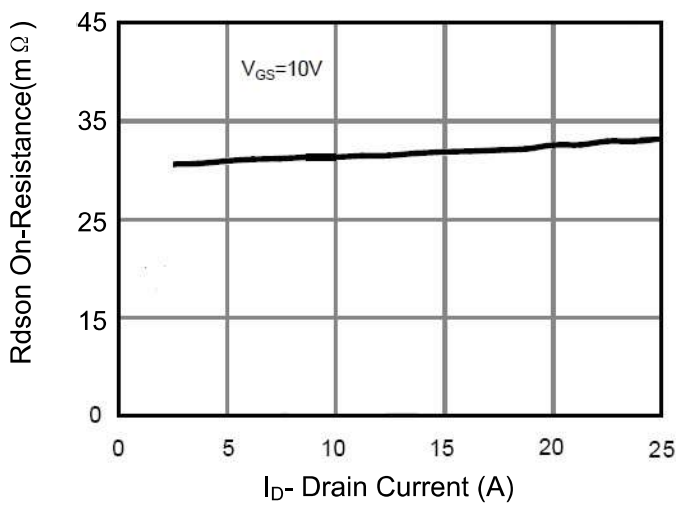


Figure 3 Rdson- Drain Current

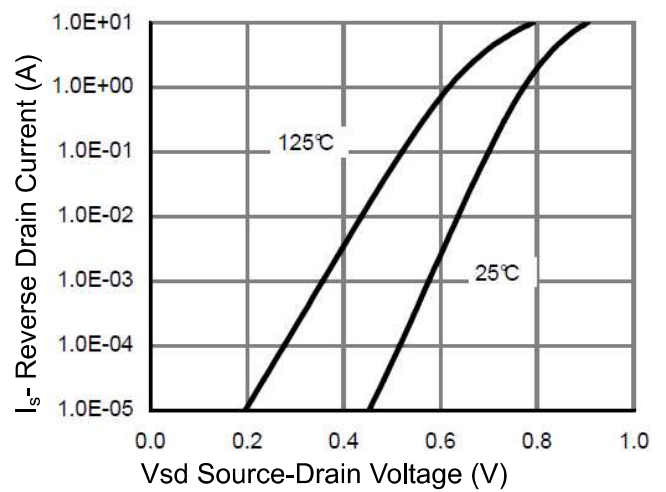


Figure 6 Source- Drain Diode Forward

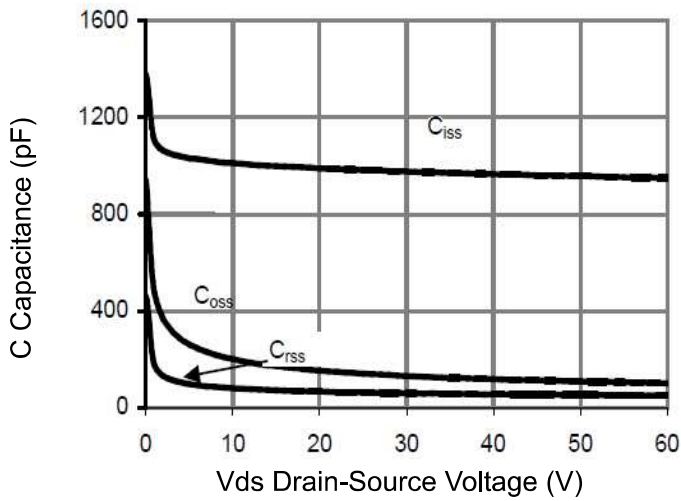


Figure 7 Capacitance vs Vds

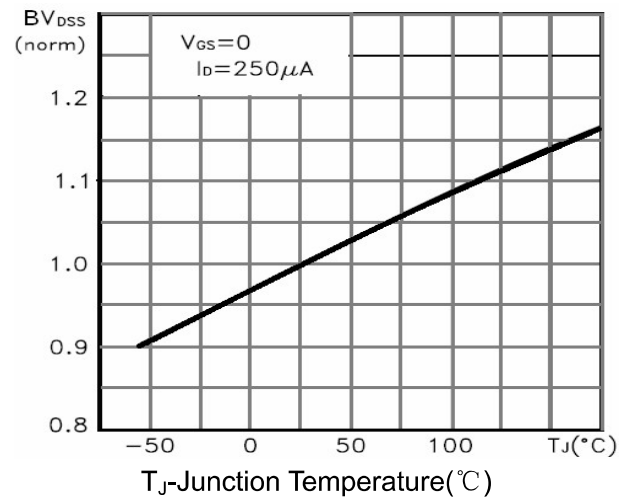


Figure 9 BV_{DSS} vs Junction Temperature

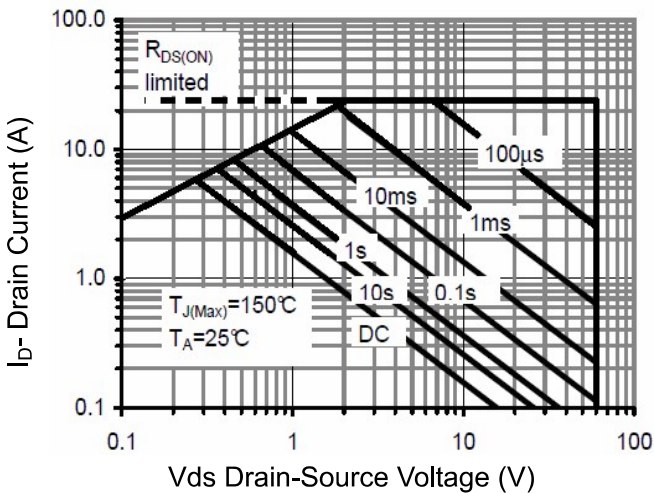


Figure 8 Safe Operation Area

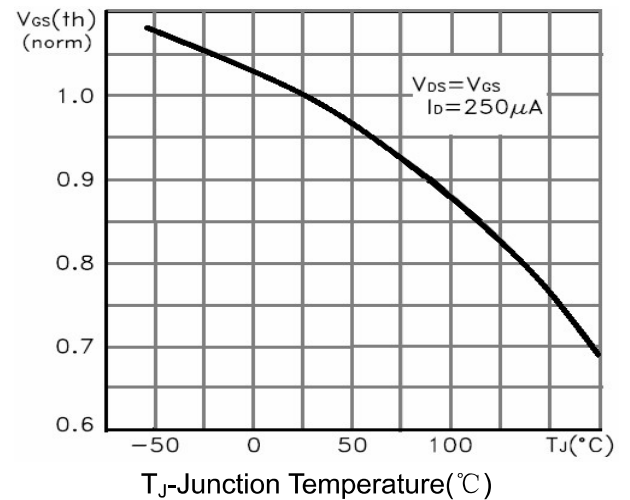


Figure 10 V_{GS(th)} vs Junction Temperature

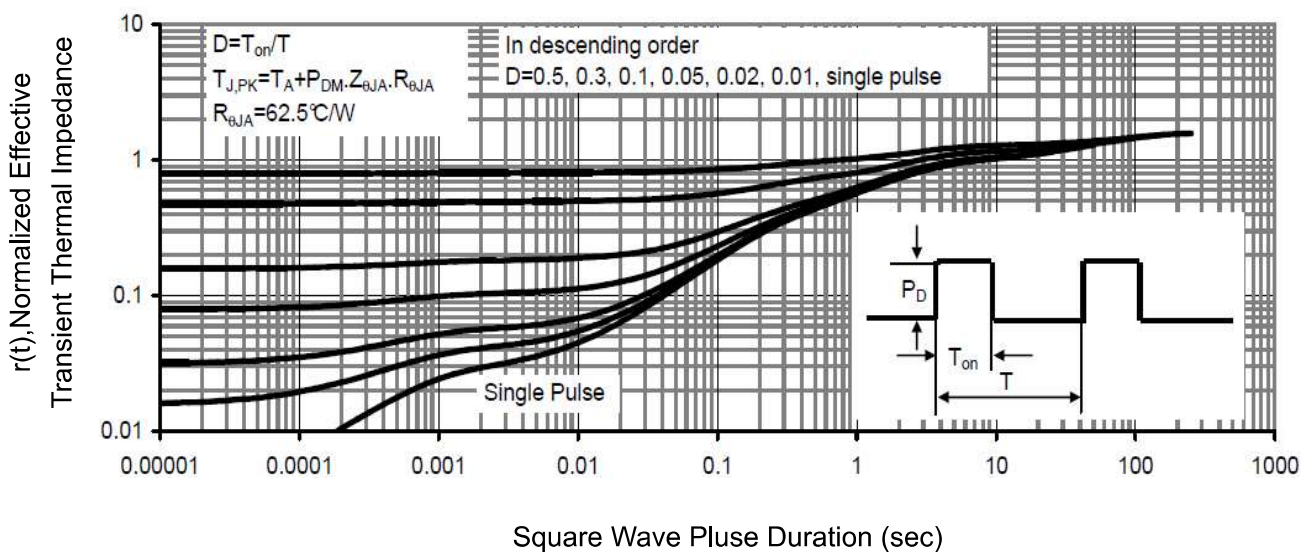
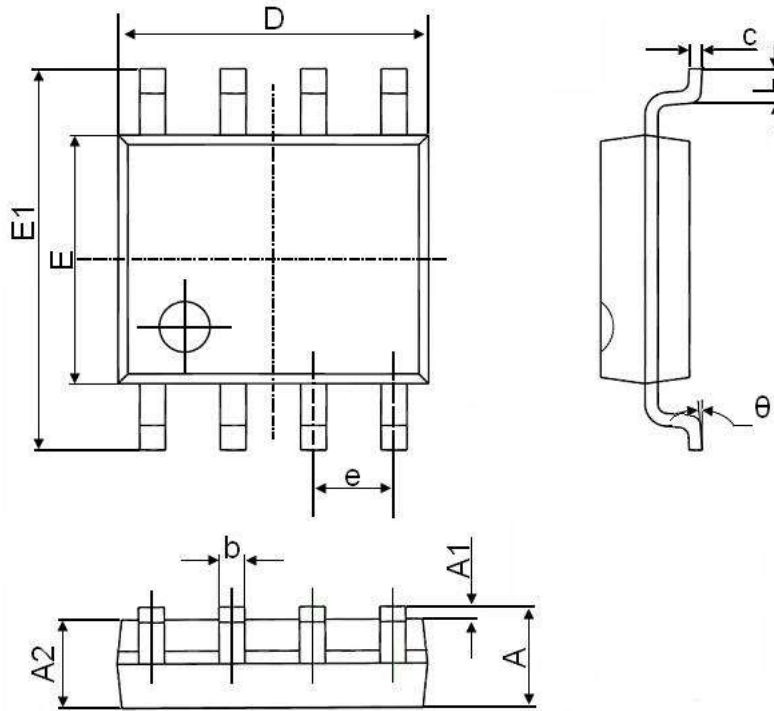


Figure 11 Normalized Maximum Transient Thermal Impedance

SOP-8 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270(BSC)		0.050(BSC)	
L	0.400	1.270	0.016	0.050
theta	0°	8°	0°	8°