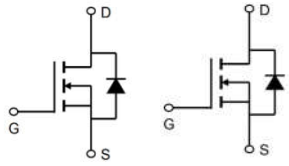
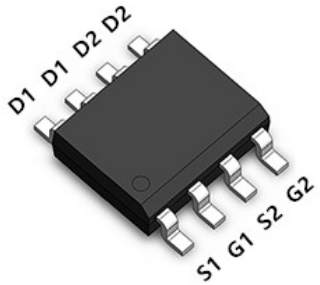
60V N+N-CHANNEL ENHANCEMENT MODE MOSFET

MAIN CHARACTERISTICS

I_D	7.2A
V_{DSS}	60V
R_{DSON}-typ(@V_{GS}=10V)	< 35mΩ(Type:28 mΩ)





SOP-8

Pb lead-free ROHS

Application

- Battery protection
- Load switch
- Uninterruptible power supply

Product Specification Classification

Part Number	Package	Marking	Pack
YFW6946S	SOP-8	YFW 6946S XXXXX	3000PCS/Tape

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Symbols	Value	Units
Drain-Source Voltage	VDS	60	V
Gate - Source Voltage	VGS	±20	V
Continuous Drain Current, V_{GS} @ 10V[1] @T_A=25℃	I_D	7.2	A
Continuous Drain Current, V_{GS} @ 10V[1] @T_A=70℃	I_D	4.8	A
Pulsed Drain Current[2]	I_{DM}	14.6	A
Single Pulse Avalanche Energy[3]	E_{AS}	21.5	mJ
Avalanche Current	I_{AS}	20.6	A
Total Power Dissipation[4] @T_A=25℃	P_D	1.2	W
Storage Temperature Range	T_{STG}	-55 to +150	°C
Operating Junction Temperature Range	T_J	-55 to +150	°C
Thermal Resistance Junction-ambient [1]	$R_{\theta JA}$	62.5	°C/W
Thermal Resistance Junction-Case[1]	$R_{\theta JC}$	36	°C/W

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Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250uA	**V(BR)DSS**	60	65	-	**V**
Zero Gate Voltage Drain Current	V_{DS}=60V, V_{GS}=0V	**I_{DSS}**	-	-	1.0	**μA**
Gate to Body Leakage Current	V_{GS}=±20V, V_{DS}=0V	**I_{GSS}**	-	-	±100	**nA**
Gate -Threshold Voltage	V_{DS}=V_{GS}, I_D=250uA	**$V_{GS(th)}$**	1.0	1.6	2.5	**V**
Static Drain-Source On-Resistance note3	V_{GS}=10V, I_D=10A	**$R_{DS(ON)}$**	-	28	35	**mΩ**
	V_{GS}=4.5V, I_D=5A		-	33	45	**mΩ**
Input Capacitance	V_{DS}=25V V_{GS}=0V f=1.0MHz	**C_{iss}**	-	1148	-	**pF**
Output Capacitance		**C_{oss}**	-	58.5	-	
Reverse Transfer Capacitance		**C_{rss}**	-	49.4	-	
Total Gate Charge	V_{DS}=30V I_D=10A V_{GS}=10V	**Q_g**	-	20.3	-	**nC**
Gate-Source Charge		**Q_{gs}**	-	3.7	-	
Gate-Drain(“Miller”) Charge		**Q_{gd}**	-	5.3	-	
Turn-on delay time	V_{DS} =30V I_D= 20A R_{GEN} = 1.8Ω V_{GS}=10V	**$t_{d(on)}$**	-	7.6	-	**ns**
Turn-on Rise Time		**T_r**	-	20	-	
Turn-Off Delay Time		**$t_{d(OFF)}$**	-	15	-	
Turn-Off Fall Time		**t_f**	-	24	-	
Maximum Continuous Drain to Source Diode Forward Current		**I_S**	-	-	20	**A**
Maximum Pulsed Drain to Source Diode Forward Current		**I_{SM}**	-	-	80	**A**
Drain to Source Diode Forward Voltage	V_{GS}=0V , I_S=20A	**V_{SD}**	-	-	1.2	**V**
Body Diode Reverse Recovery Time	I_F=20A,dI/dt=100A/μs	**t_{rr}**	-	29	-	**ns**
Body Diode Reverse Recovery Charge		**Q_{rr}**	-	43	-	**nC**

Notes:
1、 Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2、 EAS condition : T J =25℃, V DD =30V, V G =10V, L=0.5mH, Rg=25Ω, I AS =8.5A
3、 Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

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Ratings and Characteristic Curves

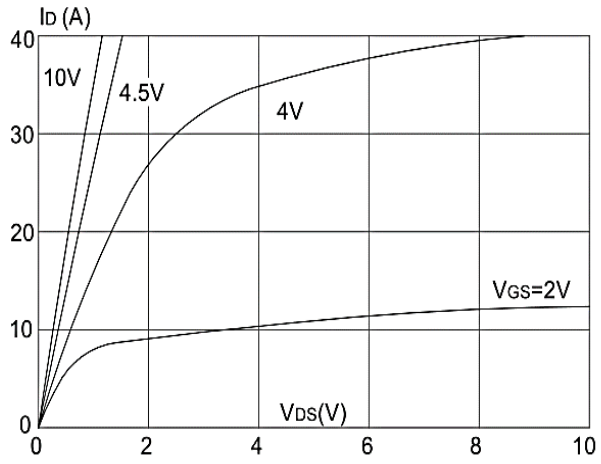

Figure1: Output Characteristics

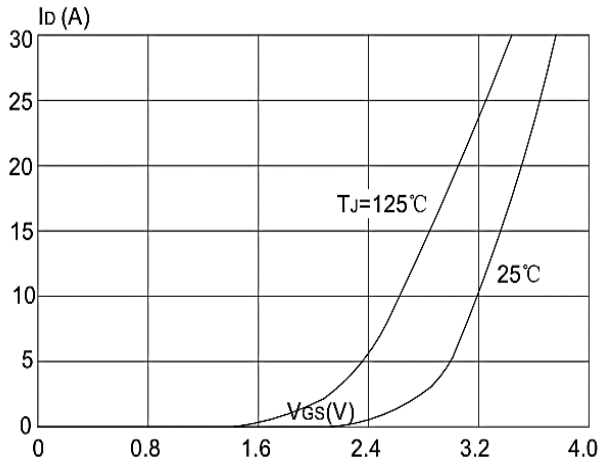

Figure 2: Typical Transfer Characteristics

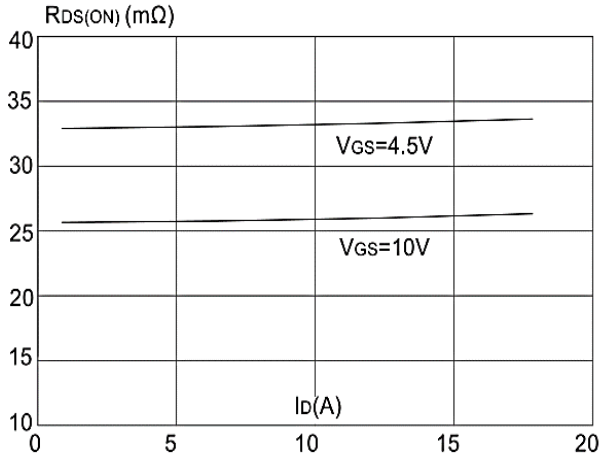

Figure 3:On-resistance vs. Drain Current

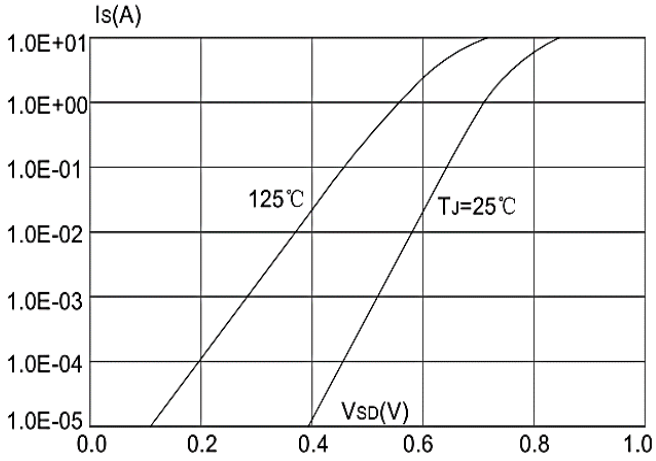

Figure 4: Body Diode Characteristics

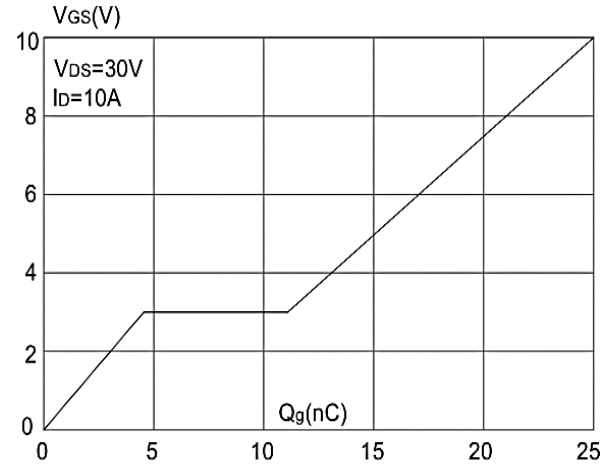

Figure 5: Gate Charge Characteristics

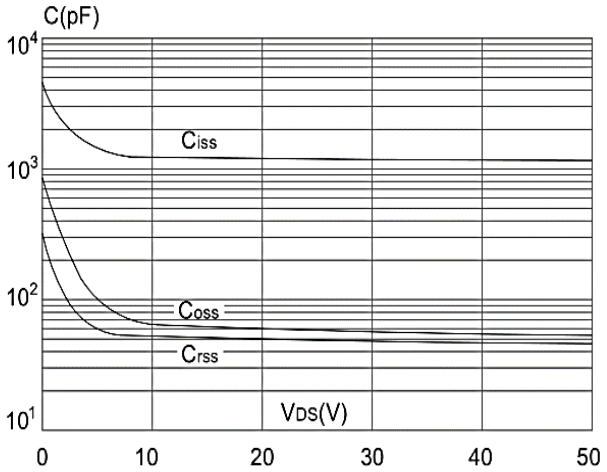

Figure 6: Capacitance Characteristics

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Ratings and Characteristic Curves

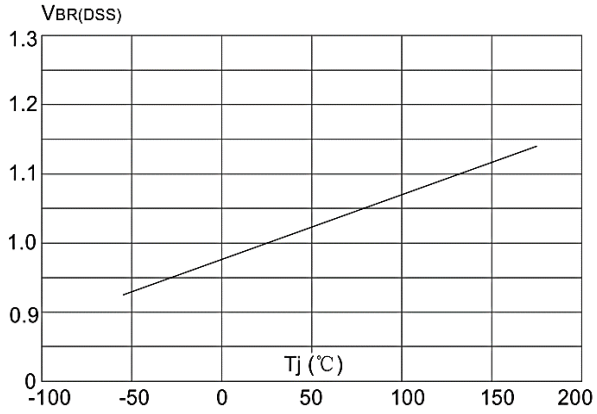

Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

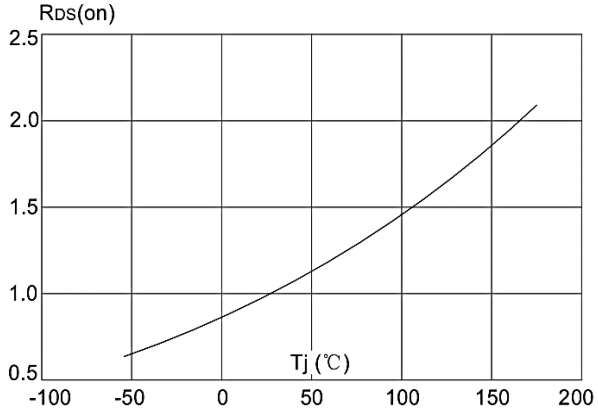

Figure 8: Normalized on Resistance vs Junction Temperature

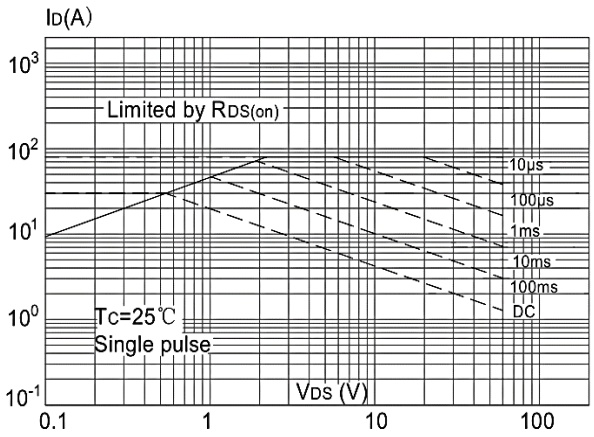

Figure 9: Maximum Safe Operating Area vs. Case Temperature

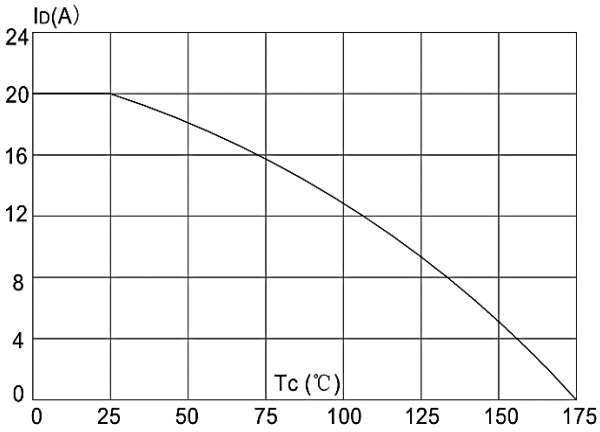

Figure 10: Maximum Continuous Drain Current

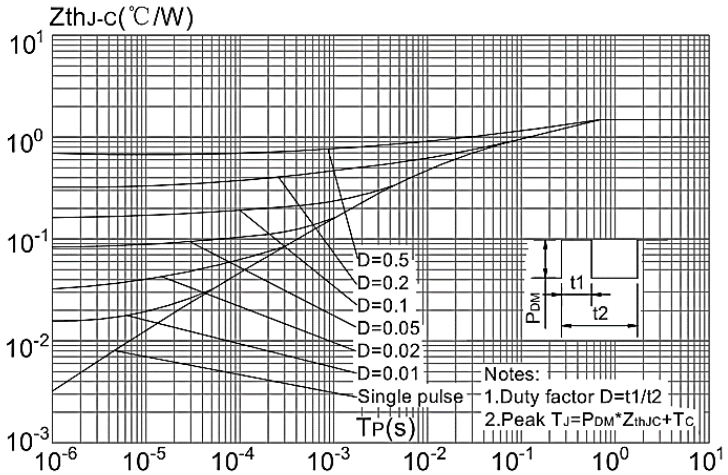

Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case

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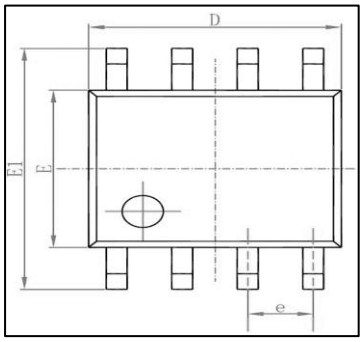
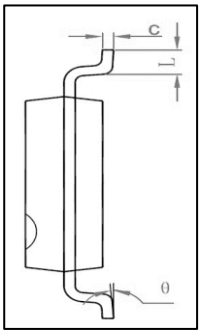
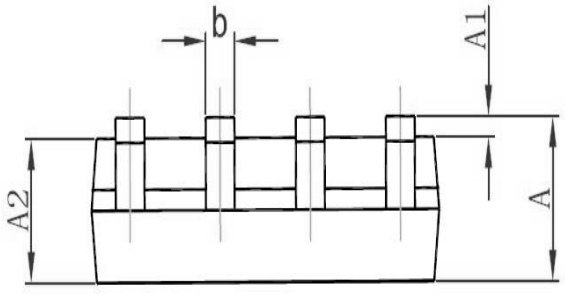
Package Outline Dimensions Millimeters

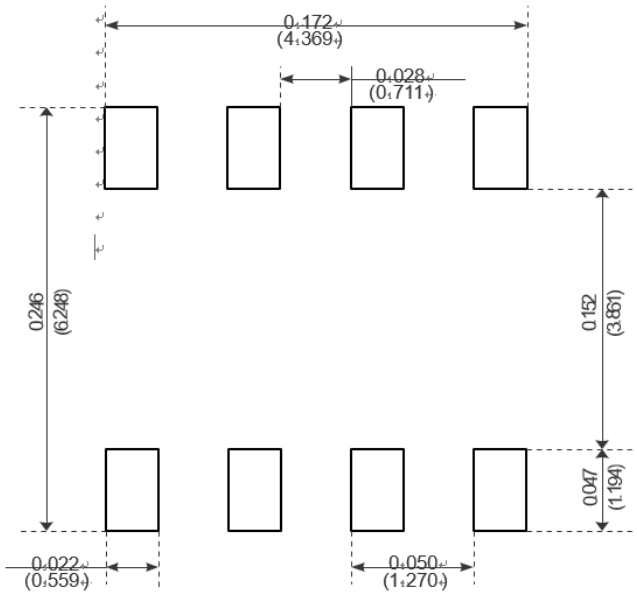
SOP-8







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
θ	0°	8°	0°	8°



Recommended Minimum Pads

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