

30V N+N-CHANNEL ENHANCEMENT MODE MOSFET

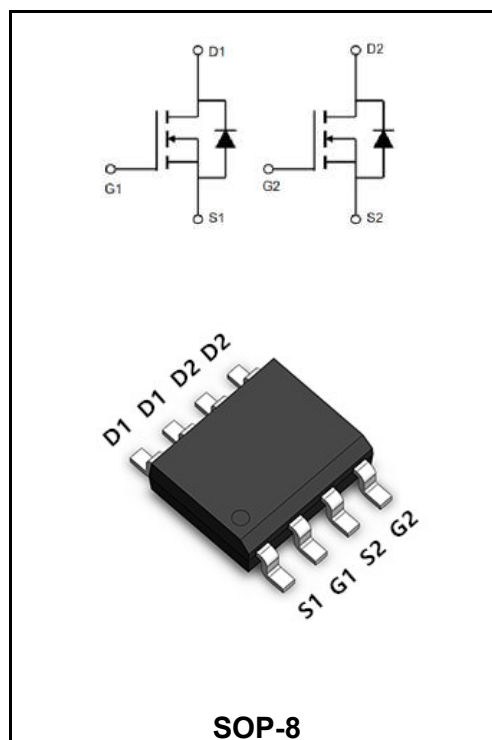
MAIN CHARACTERISTICS

I_D	10A
V_{DSS}	30V
$R_{DS(on)-typ}(@V_{GS}=10V)$	$< 12m\Omega$ (Type: 9 m Ω)



Application

- ◆ Lithium battery protection
- ◆ Wireless impact
- ◆ Mobile phone fast charging



Product Specification Classification

Part Number	Package	Marking	Pack
YFW10H03S	SOP-8	S3214 HT4001T	3000PCS/Tape

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Symbols	Value	Units
Drain-Source Voltage	V_{DS}	30	V
Gate - Source Voltage	V_{GS}	± 20	V
Continuous Drain Current, $V_{GS} @ 10V^1 @ T_C=25^\circ C$	I_D	10	A
Continuous Drain Current, $V_{GS} @ 10V^1 @ T_C=100^\circ C$	I_D	8.2	A
Continuous Drain Current, $V_{GS} @ 10V^1 @ T_A=25^\circ C$	I_D	9.5	A
Continuous Drain Current, $V_{GS} @ 10V^1 @ T_A=70^\circ C$	I_D	7.6	A
Pulsed Drain Current ²	I_{DM}	75	A
Single Pulse Avalanche Energy ³	E_{AS}	24.2	mJ
Avalanche Current	I_{AS}	22	A
Total Power Dissipation ⁴ @ $T_C=25^\circ C$	P_D	26	W
Total Power Dissipation ⁴ @ $T_A=25^\circ C$	P_D	1.67	W
Storage Temperature Range	T_{STG}	-55 to +150	$^\circ C$
Operating Junction Temperature Range	T_J	-55 to +150	$^\circ C$
Thermal Resistance Junction-ambient ¹	$R_{\theta JA}$	75	$^\circ C/W$
Thermal Resistance Junction-Case ¹	$R_{\theta JC}$	4.8	$^\circ C/W$

Maximum Ratings at Tc=25°C unless otherwise specified

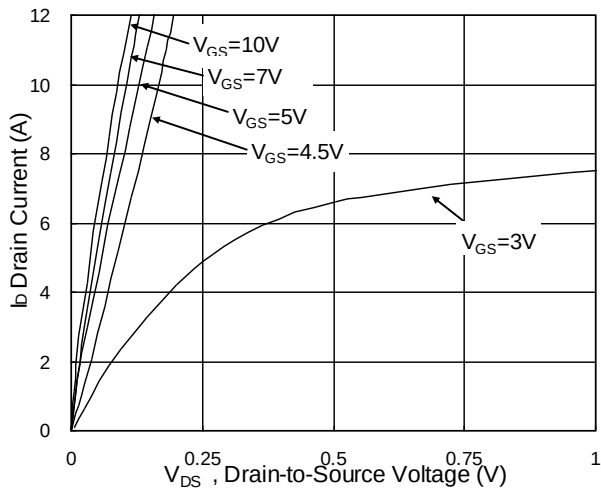
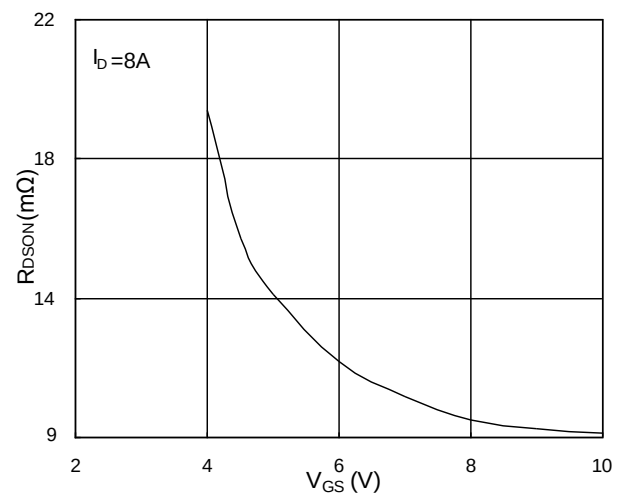
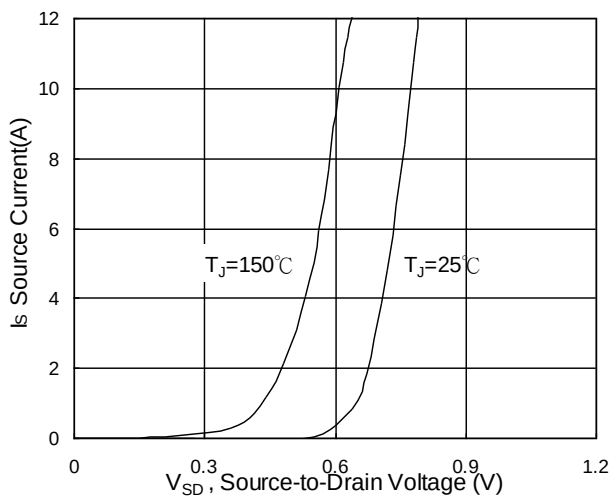
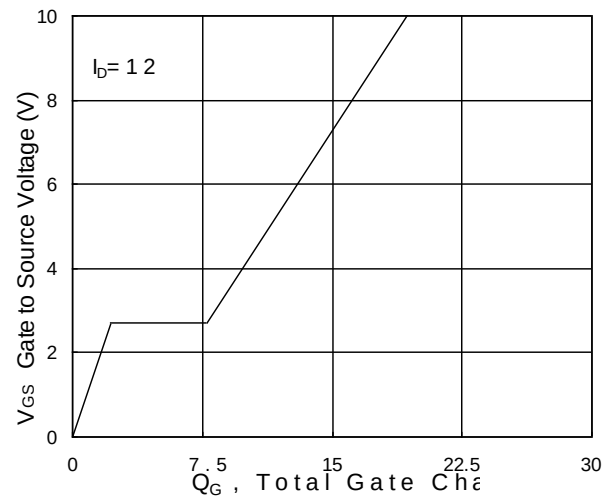
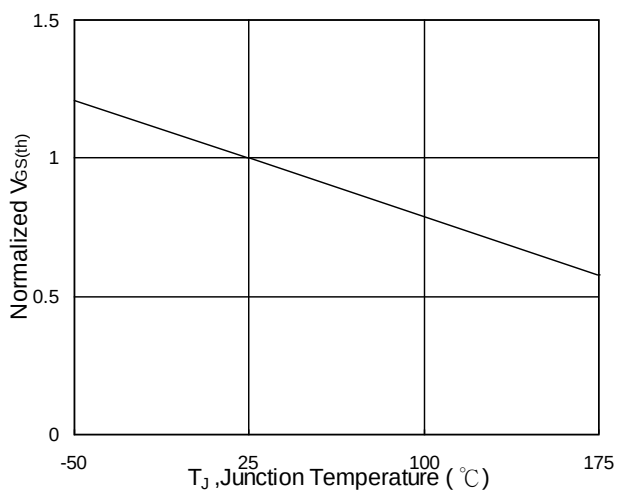
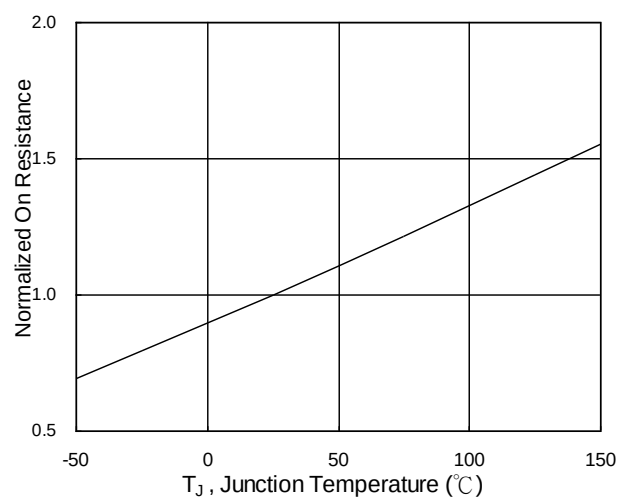
Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	$B_{V_{DS}}$	30	33	-	V
BVDSS Temperature Coefficient	Reference to 25°C, $I_D=1mA$	$\Delta B_{V_{DS}}/\Delta T_J$	-	0.023	-	V/°C
Static Drain-Source On-Resistance ²	$V_{GS}=10V, I_D=8A$	$R_{DS(ON)}$	-	9	12	mΩ
	$V_{GS}=4.5V, I_D=6A$		-	14	18	mΩ
Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	$V_{GS(th)}$	1.0	1.6	2.5	V
$V_{GS(th)}$ Temperature Coefficient		$\Delta V_{GS(th)}$	-	-5.08	-	mV/°C
Drain-Source Leakage Current	$V_{DS}=24V, V_{GS}=0V, T_J=25^\circ C$	I_{DSS}	-	-	1	uA
	$V_{DS}=24V, V_{GS}=0V, T_J=55^\circ C$		-	-	5	
Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	I_{GSS}	-	-	±100	nA
Forward Transconductance	$V_{DS}=5V, I_D=15A$	g_{fs}	-	24.4	-	S
Gate Resistance	$V_{DS}=0V, V_{GS}=0V, f=1MHz$	R_g	-	1.8	-	Ω
Total Gate Charge (4.5V)	$V_{DS}=15V$ $V_{GS}=4.5V$ $I_D=12A$	Q_g	-	9.82	-	nC
Gate-Source Charge		Q_{gs}	-	2.24	-	nC
Gate-Drain Charge		Q_{gd}	-	5.54	-	nC
Turn-on delay time	$V_{DD}=15V$ $V_{GS}=10V$ $R_G=1.5$ $I_D=20A$	$t_{d(on)}$	-	6.4	-	ns
Rise Time		T_r	-	39	-	ns
Turn-Off Delay Time		$t_{d(OFF)}$	-	21	-	ns
Fall Time		t_f	-	4.7	-	ns
Input Capacitance	$V_{DS}=15V$ $V_{GS}=0V$ $f=1.0MHz$	C_{iss}	-	896	-	pF
Output Capacitance		C_{oss}	-	126	-	pF
Reverse Transfer Capacitance		C_{rss}	-	108	-	pF
Continuous Source Current ^{1,5}	$V_G=V_D=0V$, Force Current	I_S	-	-	37	A
Pulsed Source Current ^{2,5}		I_{SM}	-	-	75	A
Diode Forward Voltage ²	$V_{GS}=0V, I_S=1A, T_J=25^\circ C$	V_{SD}	-	-	1	V

Note :

- 1、The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
- 2、The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
- 3、The EAS data shows Max. rating . The test condition is $V_{DD}=25V, V_{GS}=10V, L=0.1mH, I_{AS}=8A$
- 4、The power dissipation is limited by 175°C junction temperature
- 5、The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

Ratings and Characteristic Curves

Typical Characteristics



Ratings and Characteristic Curves

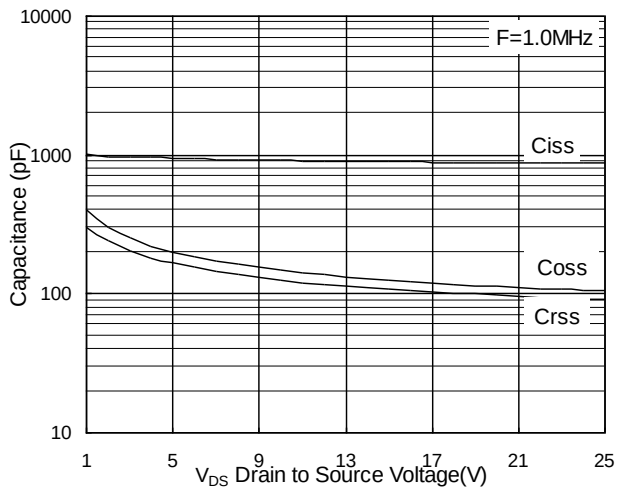


Fig.7 Capacitance

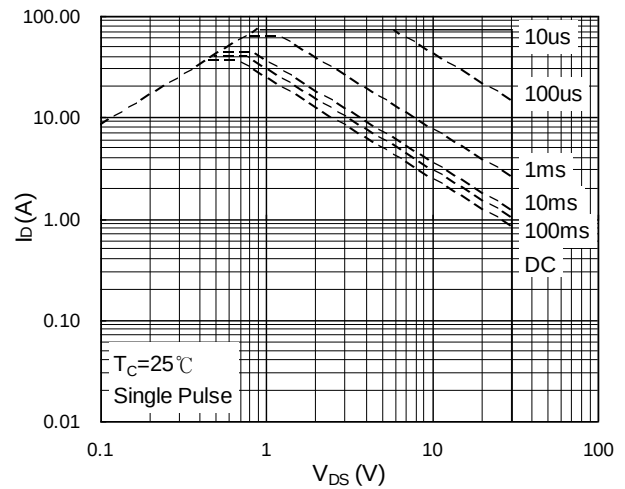


Fig.8 Safe Operating Area

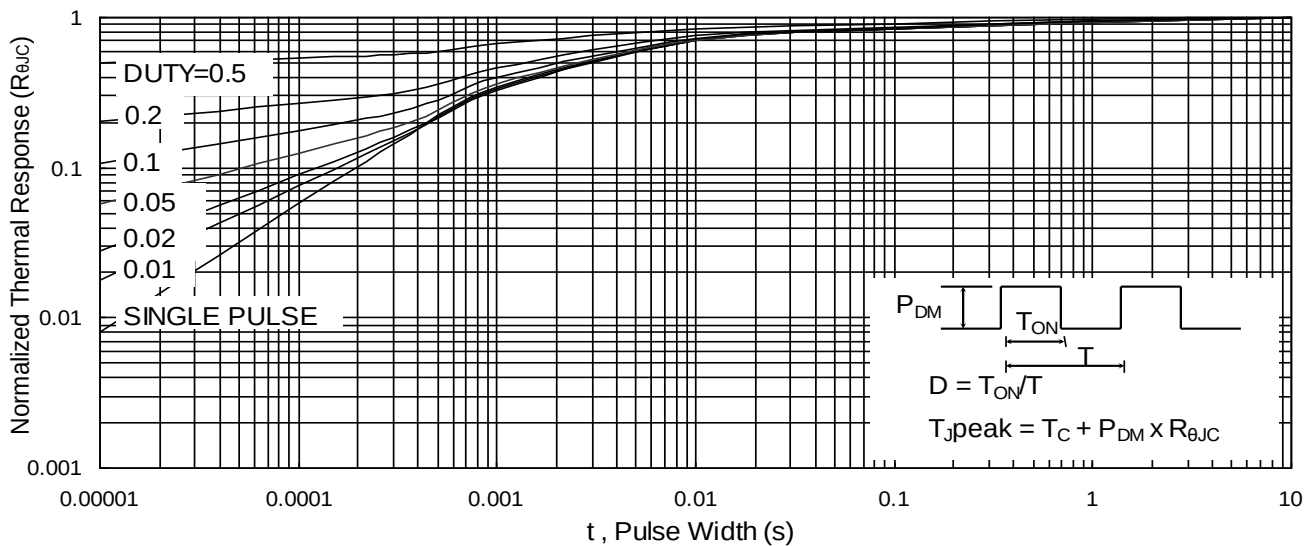


Fig.9 Normalized Maximum Transient Thermal Impedance

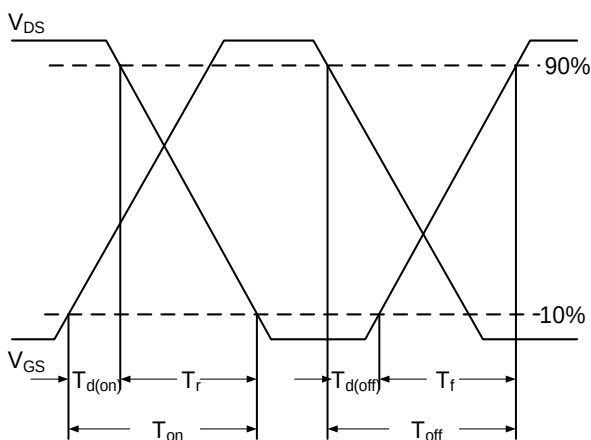


Fig.10 Switching Time Waveform

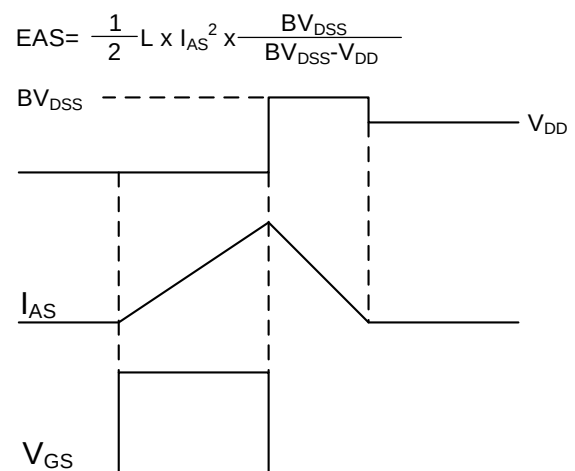
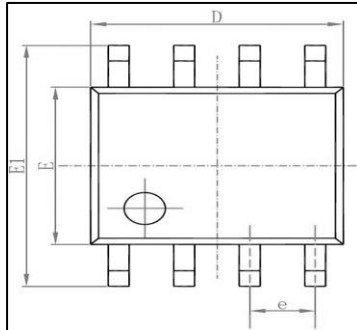
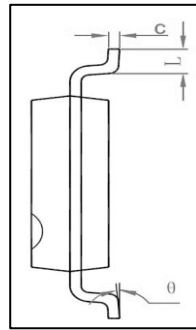
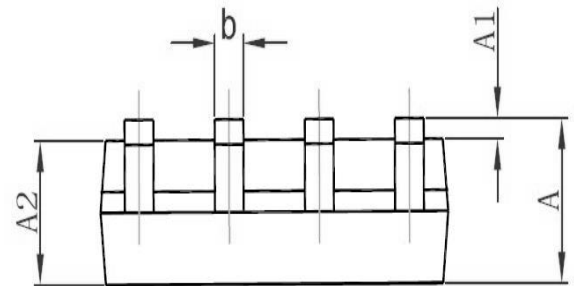
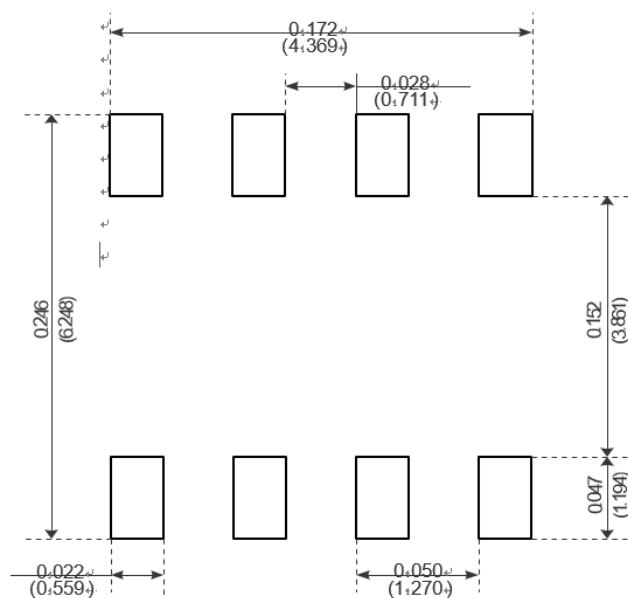


Fig.11 Unclamped Inductive Waveform

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