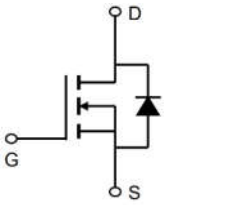
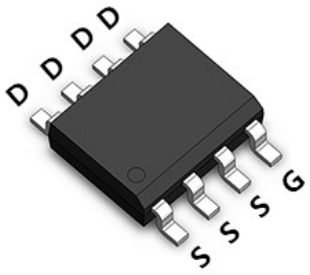
30V N-CHANNEL ENHANCEMENT MODE MOSFET

MAIN CHARACTERISTICS

I_D	40A
V_{DSS}	30V
R_{DSON}-typ(@V_{GS}=10V)	< 9mΩ(Type:7.5 mΩ)





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Application

- Battery protection
- Load switch
- Uninterruptible power supply

Product Specification Classification

Part Number	Package	Marking	Pack
YFW40N03S	SOP-8	YFW 40N03S XXXXX	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_A=25℃	I_D	40	A
Continuous Drain Current, V_{GS} @ 10V[1]@T_A=70℃	I_D	8.2	A
Pulsed Drain Current[2]	I_{DM}	82	A
Single Pulse Avalanche Energy[3]	E_{AS}	61	mJ
Avalanche Current	I_{AS}	35	A
Total Power Dissipation[4] @T_A=25℃	P_D	1.5	W
Storage Temperature Range	T_{STG}	-55 to +150	°C
Operating Junction Temperature Range	T_J	-55 to +150	°C
Thermal Resistance, Junction-to-Ambient [1]	$R_{\theta JA}$	85	°C/W
Thermal Resistance Junction-Case[1]	$R_{\theta JC}$	36	°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=250uA	BV_{DSS}	30	-	-	V
BVDSS Temperature Coefficient	Reference to 25℃ , I_D=1mA	$\Delta BV_{DSS/\Delta TJ}$	-	0.027	-	V/°C
Static Drain-Source On-Resistance[2]	V_{GS}=10V, I_D=10A	$R_{DS(ON)}$	-	7.5	9	mΩ
	V_{GS}=4.5V, I_D=8A		-	11	14	
Gate -Threshold Voltage	V_{DS}=V_{GS}, I_D=250uA	$V_{GS(th)}$	1.2	1.5	2.5	V
$V_{GS(th)}$ Temperature Coefficient		$\Delta V_{GS(th)}$	-	-5.8	-	mV/°C
Drain -Source Leakage Current	V_{DS}=24V , V_{GS}=0V , T_J=25℃	I_{DSS}	-	-	1	μA
	V_{DS}=24V , V_{GS}=0V , T_J=55℃		-	-	5	
Gate-Source Leakage Current	V_{GS}=±20V, V_{DS}=0V	I_{GSS}	-	-	±100	nA
Forward Transconductance	V_{DS}=5V, I_D=10A	g_{FS}	-	5.8	-	S
Gate Resistance	V_{DS}=0V , V_{GS}=0V , f=1MHz	R_g	-	2.2	3.8	
Total Gate Charge(4.5V)	V_{DS}=15V V_{GS}=4.5V I_D=10A	Q_g	-	12.6	17.6	nC
Gate-Source Charge		Q_{gs}	-	4.2	5.9	
Gate-Drain Charge		Q_{gd}	-	5.1	7.1	
Turn-on delay time	V_{DD}=15V V_{GS}=10V R_G=3.3 I_D=10A	$t_{d(on)}$	-	6.2	12.4	ns
Rise Time		T_r	-	59	106	
Turn-Off Delay Time		$t_{d(OFF)}$	-	27.6	55	
Fall Time		t_f	-	8.4	16.8	
Input Capacitance	V_{DS}=15V V_{GS}=0V f=1.0MHz	C_{iss}	-	1317	1845	pF
Output Capacitance		C_{oss}	-	163	228.2	
Reverse Transfer Capacitance		C_{rss}	-	131	183.4	
Continuous Source Current[1,5]	V_G=V_D=0V , Force Current	I_S	-	-	10.3	A
Pulsed Source Current[2,5]		I_{SM}	-	-	42	A
Diode Forward Voltage [2]	V_{GS}=0V , I_S=1A , T_J=25℃	V_{SD}	-	-	1.2	V
Reverse Recovery Time	I_F=10A , dI/dt=100A/μs , T_J=25℃	t_{rr}	-	12.5	-	nS
Reverse Recovery Charge		Q_{rr}	-	5	-	nC

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 ≦ 300us , duty cycle ≦ 2%
3 .The EAS data shows Max. rating . The test condition is VDD=25V,VGS=10V,L=0.1mH,IAS=35A
4.The power dissipation is limited by 150℃ junction temperature
5.The data is theoretically the same as ID and IDM , in real applications , should be limited by total power dissipation.

Ratings and Characteristic Curves

Typical Characteristics

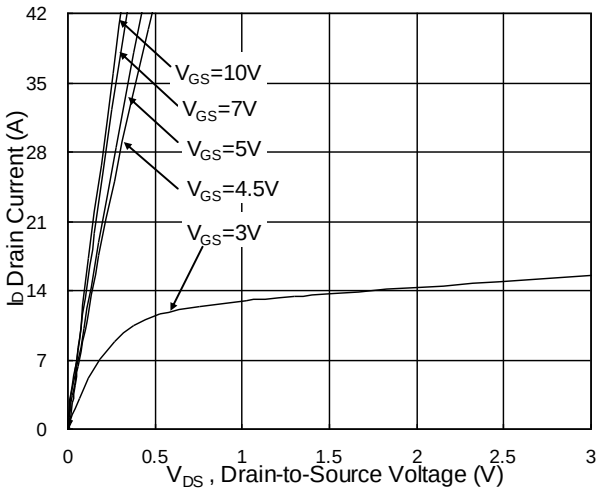

Fig.1 Typical Output Characteristics

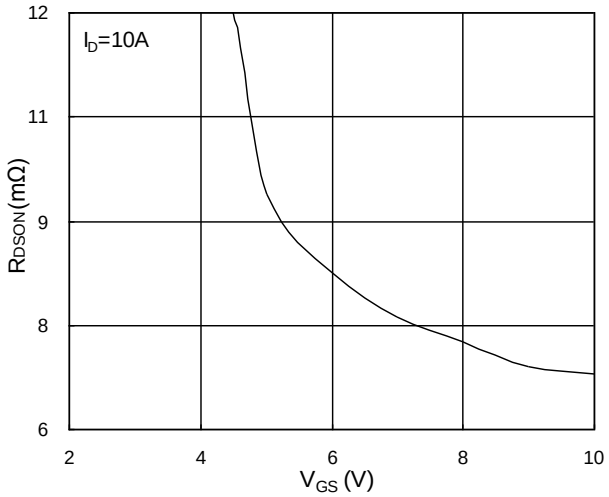

Fig.2 On-Resistance vs. Gate-Source

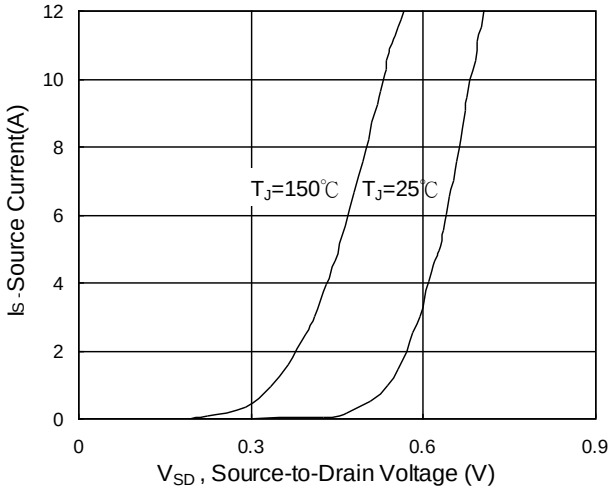

Fig.3 Forward Characteristics of reverse

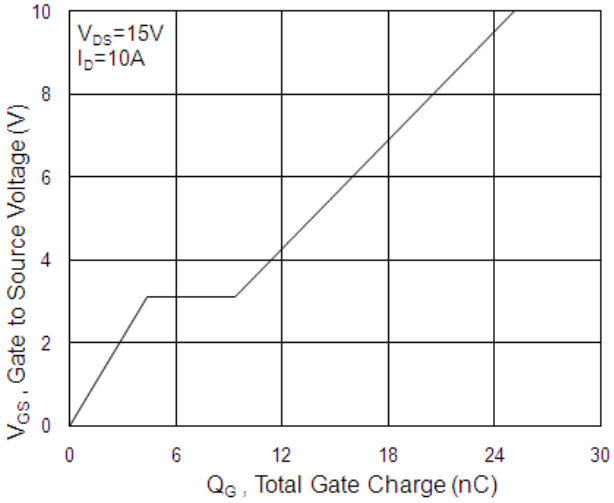

Fig.4 Gate-Charge Characteristics

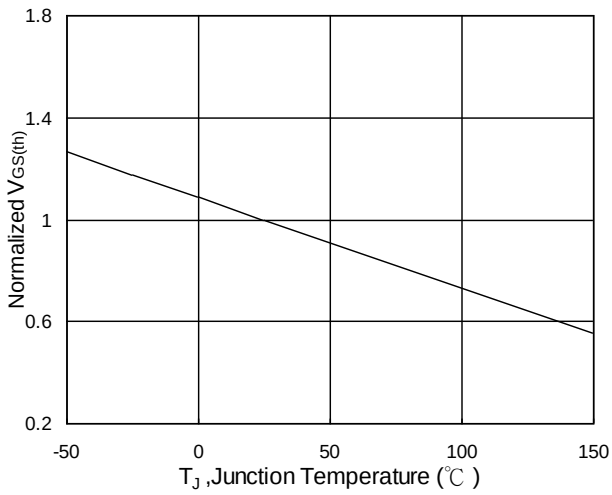

Fig.5 Normalized $V_{GS(th)}$ vs. T_J

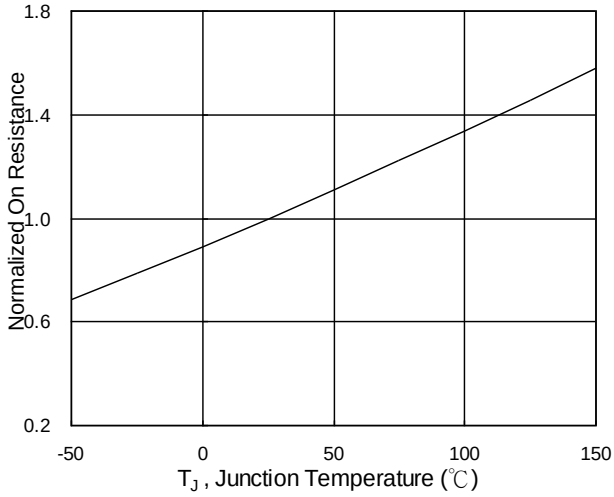

Fig.6 Normalized R_{DSON} vs. T_J

Ratings and Characteristic Curves

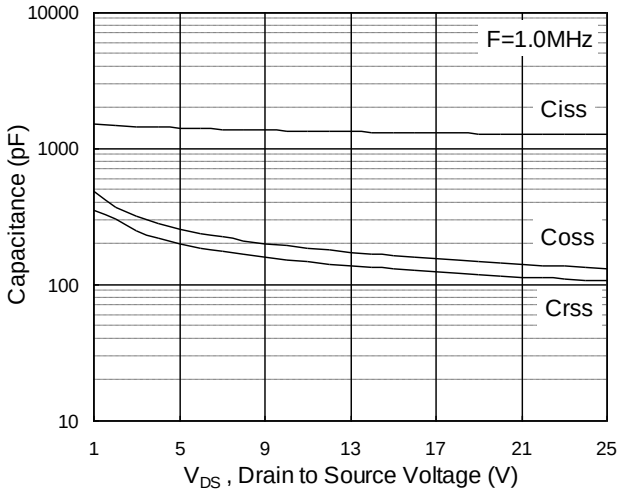

Fig.7 Capacitance

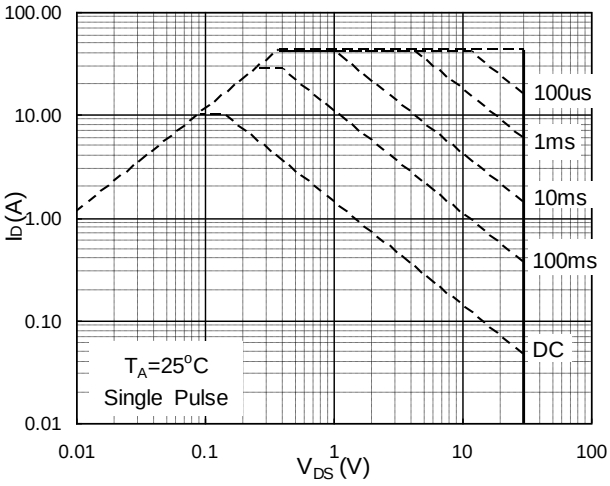

Fig.8 Safe Operating Area

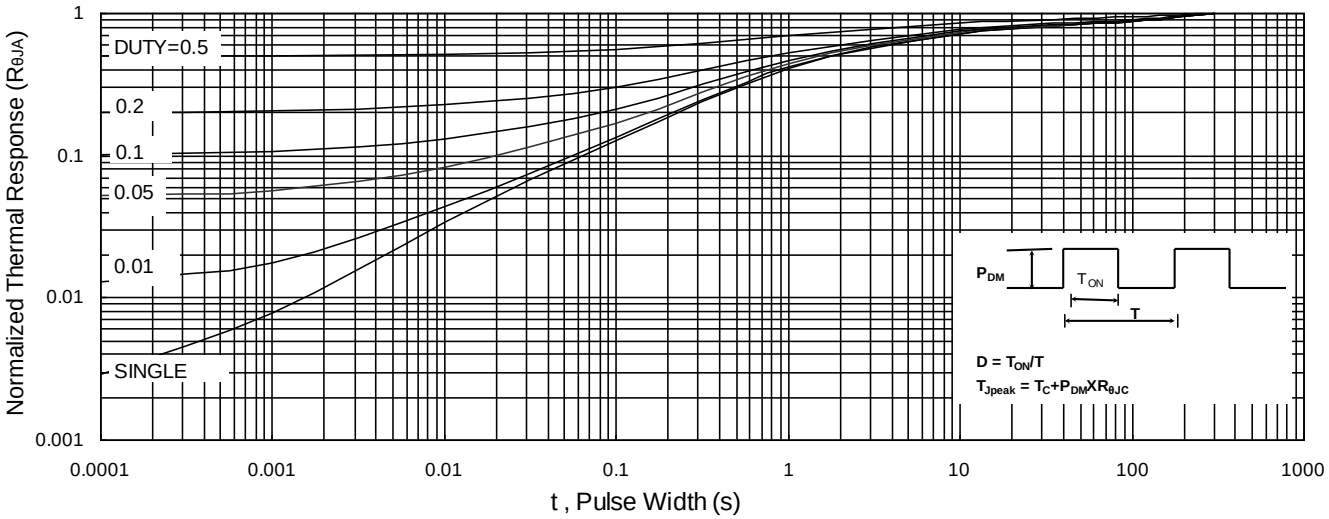

Fig.9 Normalized Maximum Transient Thermal Impedance

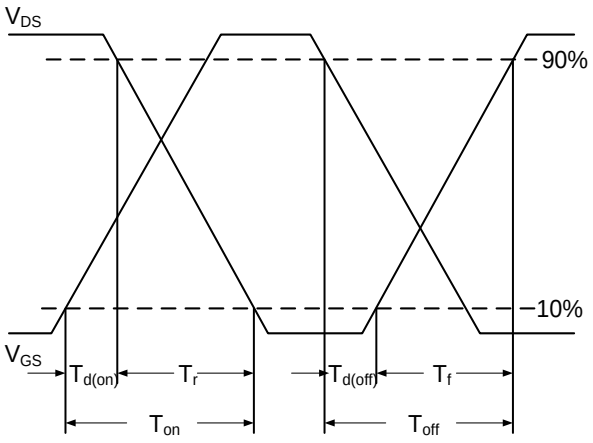

Fig.10 Switching Time Waveform

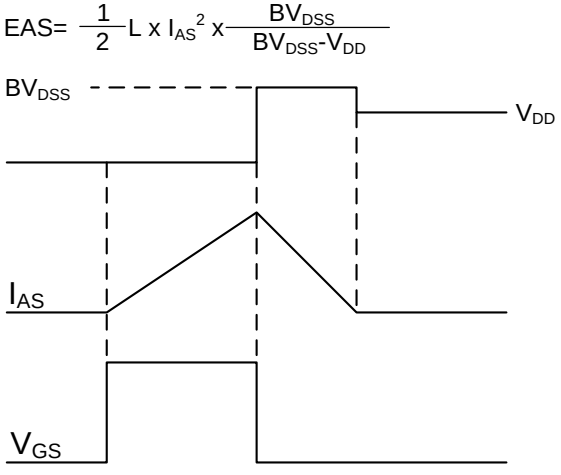

Fig.11 Unclamped Inductive Switching Waveform

Package Outline Dimensions Millimeters

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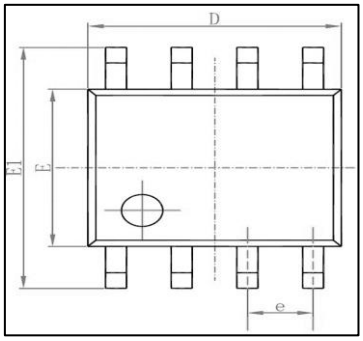
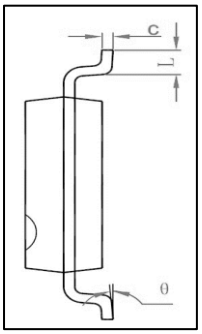
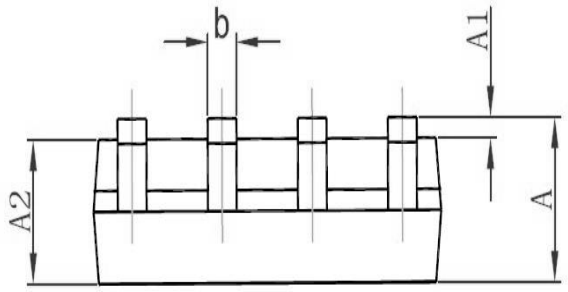
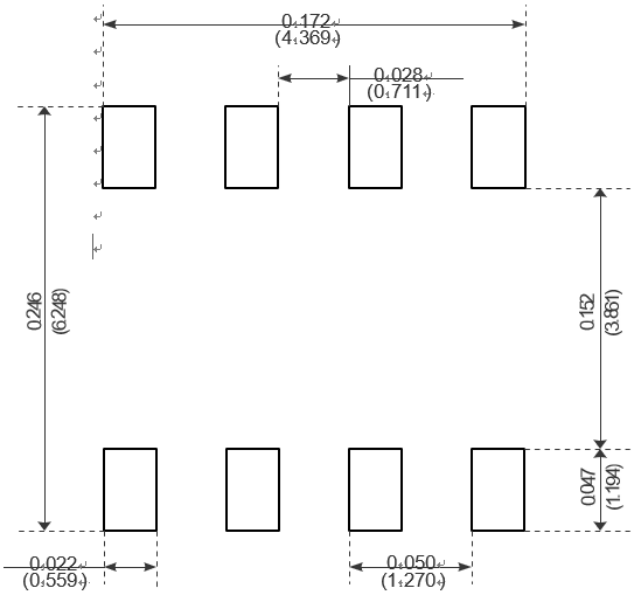






Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270 (BSC)		0.050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



Recommended Minimum Pads