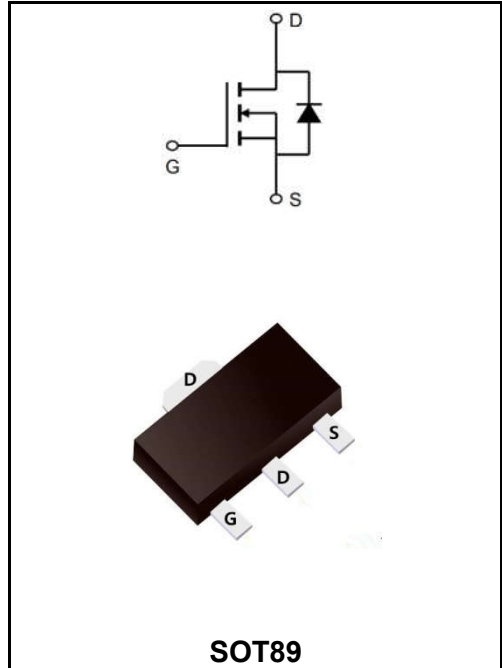


30V N-CHANNEL ENHANCEMENT MODE MOSFET

MAIN CHARACTERISTICS

I_D	6A
V_{DSS}	30V
R_{DS(on)-typ(@V_{GS}=4.5V)}	< 35mΩ(Type:29 mΩ)



Application

- ◆ Battery protection
- ◆ Load switch
- ◆ Uninterruptible power supply

Product Specification Classification

Part Number	Package	Marking	Pack
YFW6N03SI	SOT89	YFW HD36	1000PCS/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}	±12	V
Continuous Drain Current, V _{GS} @ 10V ¹ @T _A =25°C	I_D	6	A
Continuous Drain Current, V _{GS} @ 10V ¹ @T _A =70°C	I_D	4.7	A
Pulsed Drain Current ²	I_{DM}	30	A
Total Power Dissipation ³ @T _A =25°C	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_{θJA}	85	°C/W
Thermal Resistance Junction-Case ¹	R_{θJC}	30	°C/W

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	BV_{DSS}	30	-	-	V
BVDSS Temperature Coefficient	Reference to 25°C, $I_D=1mA$	$\Delta BV_{DSS}/\Delta T_J$	-	0.021	-	V/°C
Static Drain-Source On-Resistance ²	$V_{GS}=4.5V, I_D=5A$	$R_{DS(ON)}$	-	29	35	mΩ
	$V_{GS}=2.5V, I_D=4A$		-	36	40	
Gate -Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	$V_{GS(th)}$	0.5	0.9	1.5	V
VGS(th) Temperature Coefficient		$\Delta V_{GS(th)}$	-	-5	-	mV/°C
Gate -Source Leakage Current	$V_{DS}=24V, V_{GS}=0V, T_J=25^\circ C$	I_{DSS}	-	-	1	μA
	$V_{DS}=24V, V_{GS}=0V, T_J=55^\circ C$		-	-	5	
Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	I_{GSS}	-	-	±100	nA
Forward Transconductance	$V_{DS}=5V, I_D=5A$	g_{FS}	-	7	-	S
Gate Resistance	$V_{DS}=0V, V_{GS}=0V, f=1MHz$	R_g	-	2.5	5	Ω
Total Gate Charge(4.5V)	$V_{DS}=15V$ $V_{GS}=4.5V$ $I_D=5A$	Q_g	-	6	8.4	nC
Gate-Source Charge		Q_{gs}	-	2.5	3.5	
Gate-Drain Charge		Q_{gd}	-	2.1	2.9	
Turn-on delay time	$V_{DD}=15V$ $V_{GS}=10V$ $R_G=3.3$ $I_D=5A$	$t_{d(on)}$	-	2.4	4.8	ns
Rise Time		T_r	-	7.8	14	
Turn-Off Delay Time		$t_{d(OFF)}$	-	22	44	
Fall Time		t_f	-	4	8	
Input Capacitance	$V_{DS}=15V$ $V_{GS}=0V$ $f=1.0MHz$	C_{iss}	-	572	800	pF
Output Capacitance		C_{oss}	-	81	112	
Reverse Transfer Capacitance		C_{rss}	-	65	91	
Continuous Source Current ^{1,4}	$V_G=V_D=0V, \text{ Force Current}$	I_S	-	-	5.8	A
Pulsed Source Current ^{2,4}		I_{SM}	-	-	30	A
Diode Forward Voltage ²	$V_{GS}=0V, I_S=3A, T_J=25^\circ C$	V_{SD}	-	-	1.2	V
Reverse Recovery Time	$I_F=5A, di/dt=100A/\mu s, T_J=25^\circ C$	t_{rr}	-	19	-	ns
Reverse Recovery Charge		Q_{rr}	-	1.04	-	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 $\leq 300\mu s$, duty cycle $\leq 2\%$
- 3.The power dissipation is limited by 150°C junction temperature
- 4 .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

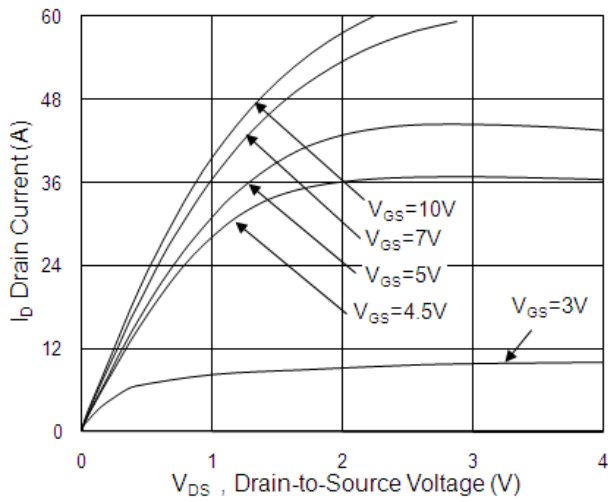


Fig.1 Typical Output Characteristics

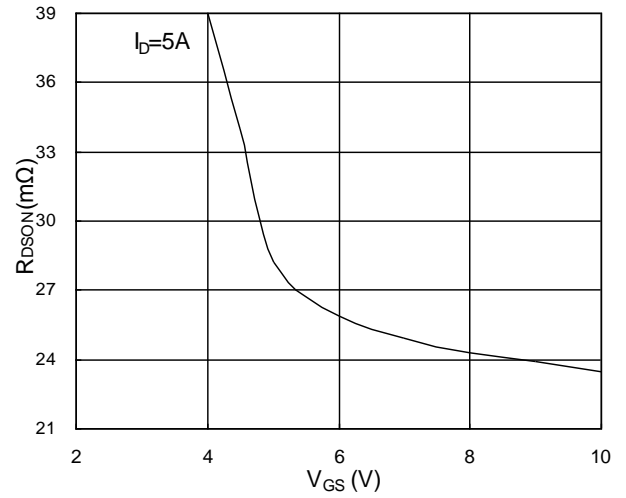


Fig.2 On-Resistance vs. G-S Voltage

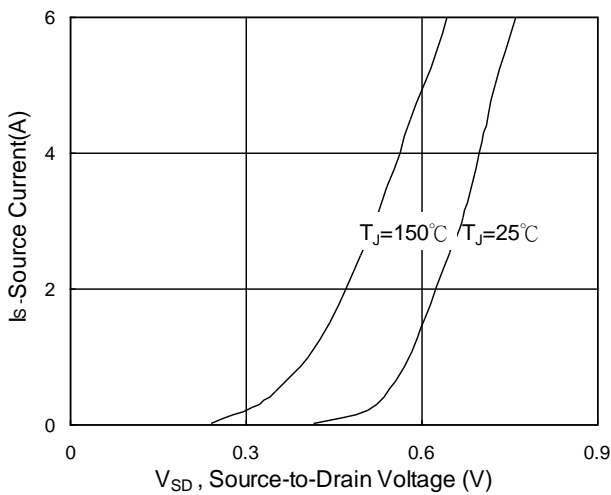


Fig.3 Forward Characteristics Of Reverse

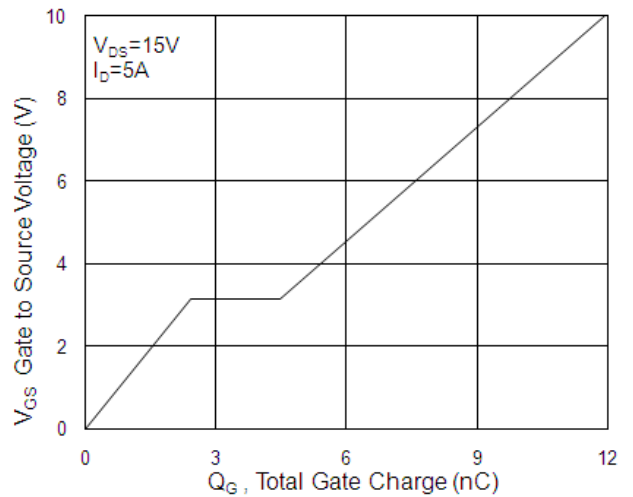


Fig.4 Gate-Charge Characteristics

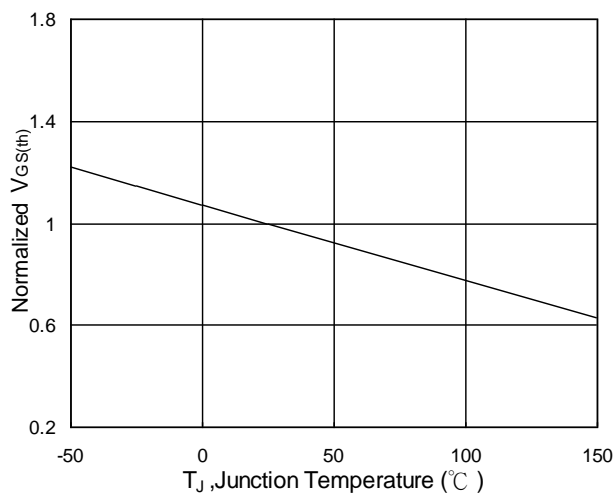


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

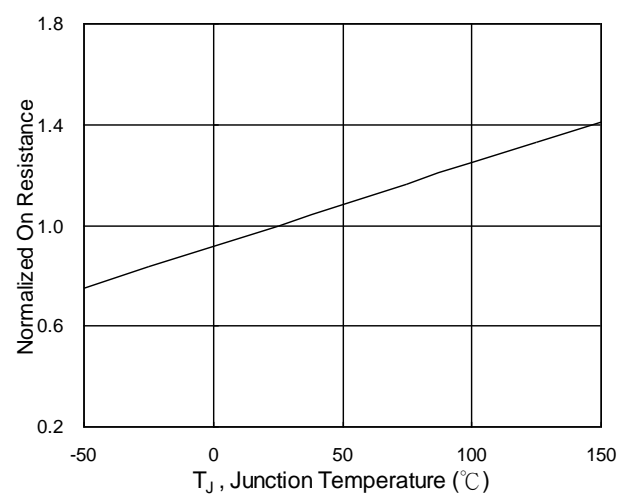


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

Ratings and Characteristic Curves

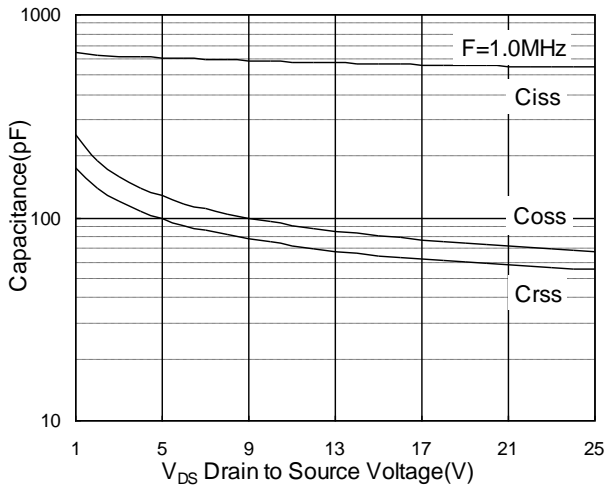


Fig.7 Capacitance

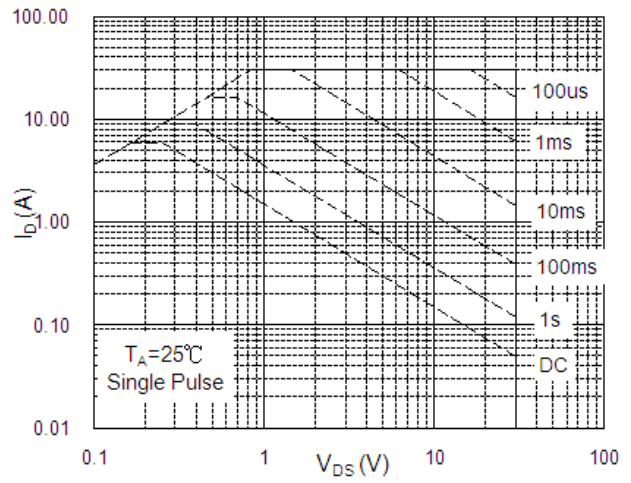


Fig.8 Safe Operating Area

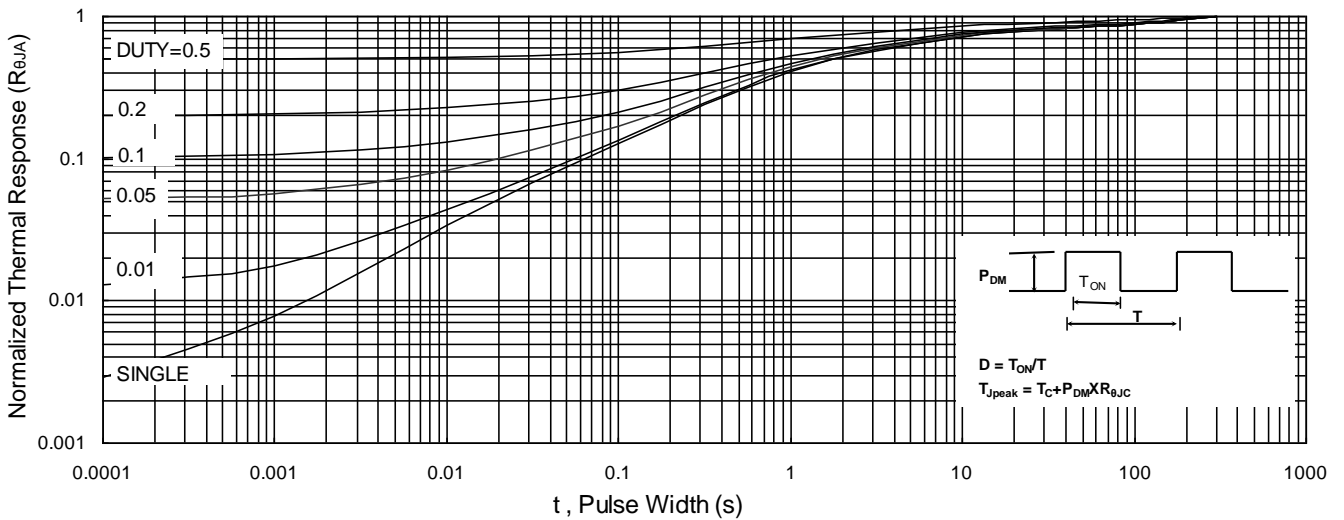


Fig.9 Normalized Maximum Transient Thermal Impedance

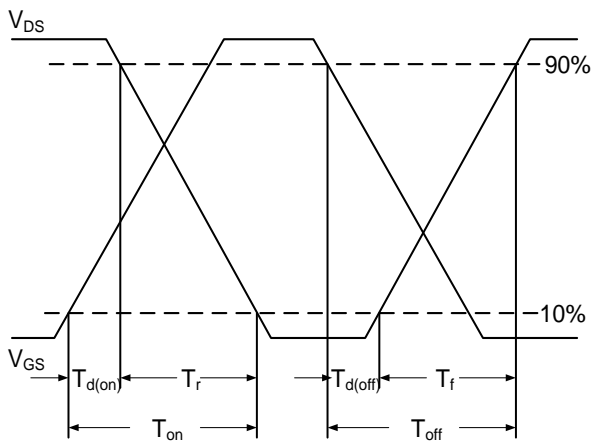


Fig.10 Switching Time Waveform

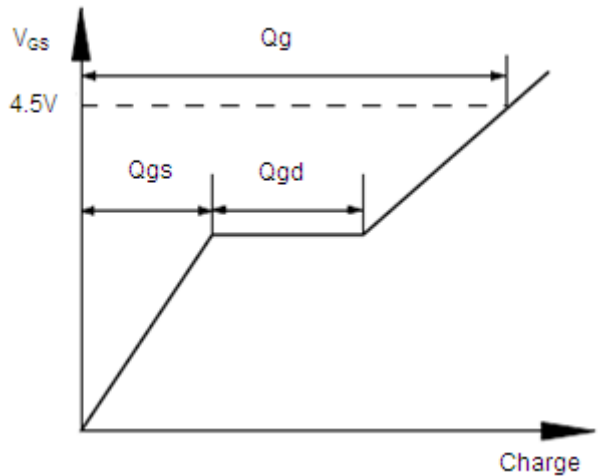
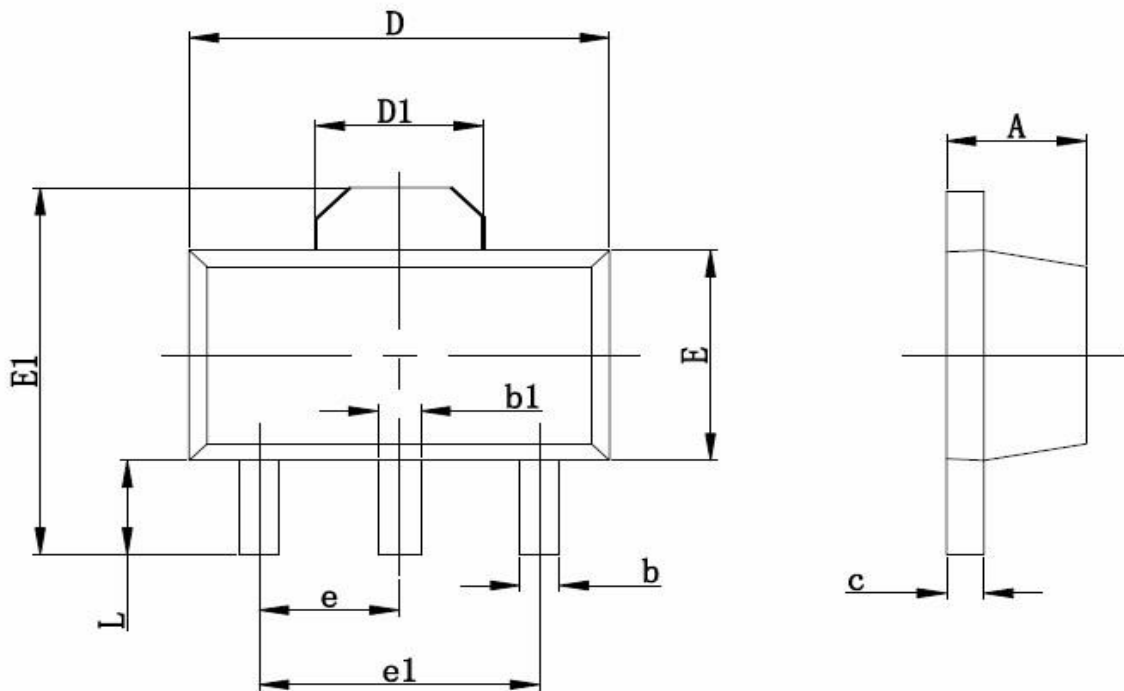


Fig.11 Gate Charge Waveform

SOT-89



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.400	1.600	0.055	0.063
b	0.350	0.520	0.013	0.197
b1	0.400	0.580	0.016	0.023
c	0.350	0.440	0.014	0.017
D	4.400	4.600	0.173	0.181
D1	1.550 REF		0.061 REF	
E	2.350	2.550	0.091	0.102
E1	3.940	4.250	0.155	0.167
e	1.500 TYP		0.060TYP	
e1	3.000 TYP		0.118TYP	
L	0.900	1.100	0.035	0.047