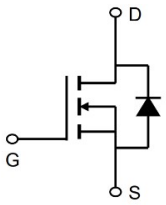
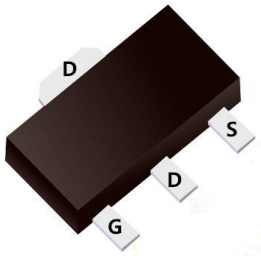
100V N-CHANNEL ENHANCEMENT MODE MOSFET

MAIN CHARACTERISTICS

I_D	5A
V_{DSS}	100V
R_{DSON}-typ(@V_{GS}=10V)	< 110mΩ(Type:88 mΩ)





SOT-89

Pb lead-free ROHS

Application

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

Product Specification Classification

Part Number	Package	Marking	Pack
YFW5N10SI	SOT-89	5N10SI	3000PCS/Tape

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Symbols	Value	Units
Drain-Source Voltage	V_{DS}	100	V
Gate - Source Voltage	V_{GS}	±20	V
Continuous Drain Current, V_{GS} @ 10V[1] @T_A=25 ℃	I_D	5	A
Continuous Drain Current, V_{GS} @ 10V[1] @T_A=70 ℃	I_D	3.6	A
Pulsed Drain Current[2]	I_{DM}	15	A
Total Power Dissipation[3] @T_A=25 ℃	P_D	3.5	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]	$R_{\theta JA}$	85	°C/W
Thermal Resistance Junction-Case[1]	$R_{\theta JC}$	40	°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}	100	-	-	V
BVDSS Temperature Coefficient	Reference to 25℃ , ID=1mA	$\Delta BV_{DSS/\Delta TJ}$	-	0.122	-	V/°C
Static Drain-Source On-Resistance [2]	V_{GS}=10V, I_D=3A	$R_{DS(ON)}$	-	88	110	mΩ
	V_{GS}=4.5V, I_D=2A		-	95	125	
Gate -Threshold Voltage	V_{DS}=V_{GS}, I_D=250uA	$V_{GS(th)}$	1.2	1.6	2.5	V
V_{GS}(th) Temperature Coefficient		$\Delta V_{GS(th)}$	-	-4.84	-	mV/°C
Drain-Source Leakage Current	V_{DS}=100V , V_{GS}=0V , T_J=25℃	I_{DSS}	-	-	10	μA
	V_{DS}=100V , V_{GS}=0V , T_J=55℃		-	-	100	
Gate –Source Leakage Current	V_{GS}=±20V, V_{DS}=0V	I_{GSS}	-	-	±100	nA
Forward Transconductance	V_{DS}=5V , I_D=2A	g_{fs}	-	10.2	-	S
Gate Resistance	V_{DS}=0V , V_{GS}=0V , f=1MHz	R_g	-	2.3	4.6	Ω
Total Gate Charge(10V)	V_{DS}=60V V_{GS}=10V I_D=2A	Q_g	-	25.5	-	nC
Gate-Source Charge		Q_{gs}	-	4.2	-	
Gate-Drain Charge		Q_{gd}	-	4.3	-	
Turn-on delay time	V_{DD} =50V V_{GS}=10V I_D= 1A R_G=3.3Ω	$t_{d(on)}$	-	17.3	-	ns
Rise Time		T_r	-	2.8	-	
Turn-Off Delay Time		$t_{d(OFF)}$	-	50	-	
Fall Time		t_f	-	2.8	-	
Input Capacitance	V_{DS}=15V V_{GS}=0V f=1.0MHz	C_{iss}	-	677	-	pF
Output Capacitance		C_{oss}	-	46	-	
Reverse Transfer Capacitance		C_{rss}	-	32	-	
Continuous Source Current [1,4]	V_G=V_D=0V , Force Current	I_S	-	-	2	A
Pulsed Source Current [2,4]		I_{SM}	-	-	4	A
Diode Forward Voltage [2]	V_{GS}=0V , I_S=1A , T_J=25℃	V_{SD}	-	-	1.2	V

Note :
1、The data tested by surface mounted on a 1 inch 2 FR-4 board with 2OZ copper.
2、The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%
3、The power dissipation is limited by 150℃ 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

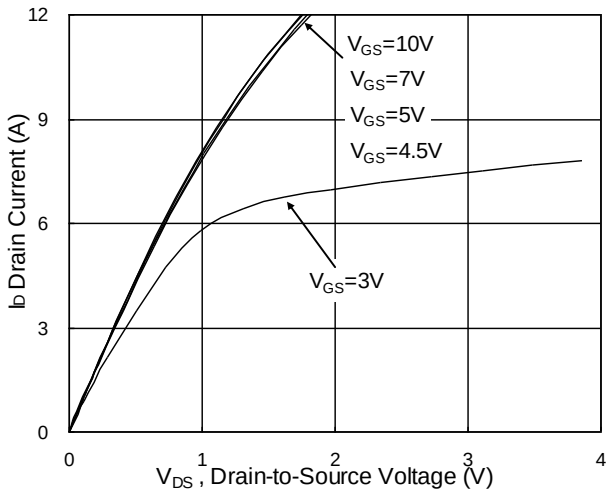


Fig.1 Typical Output Characteristics

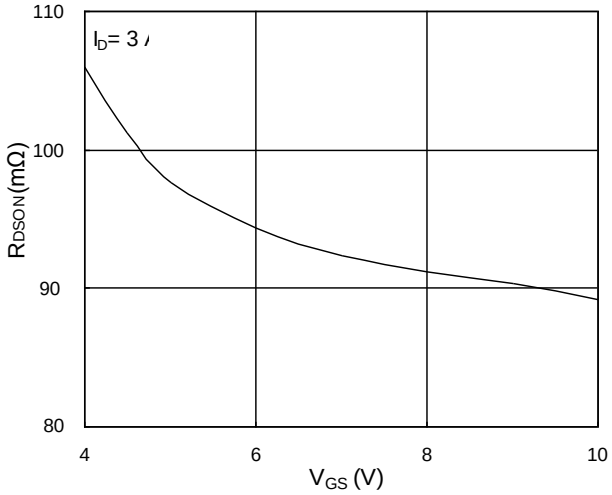


Fig.2 On-Resistance vs. Gate-Source

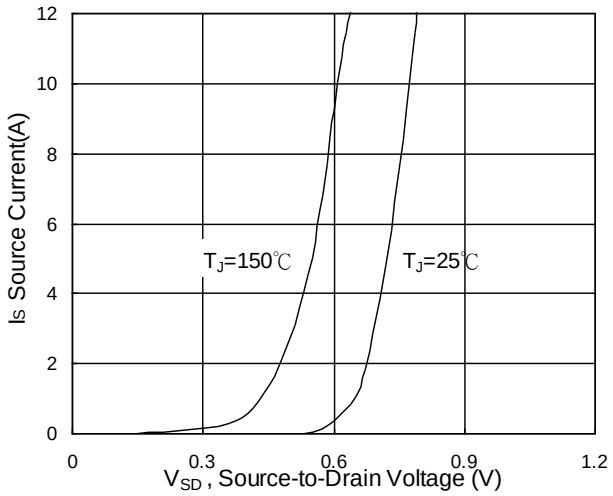


Fig.3 Forward Characteristics Of Reverse

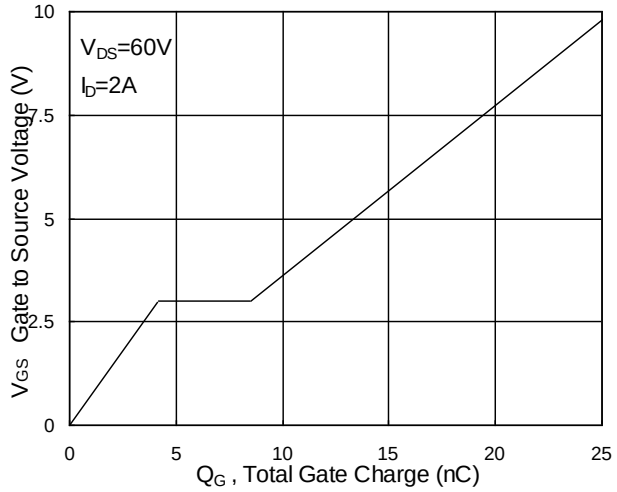


Fig.4 Gate-Charge Characteristics

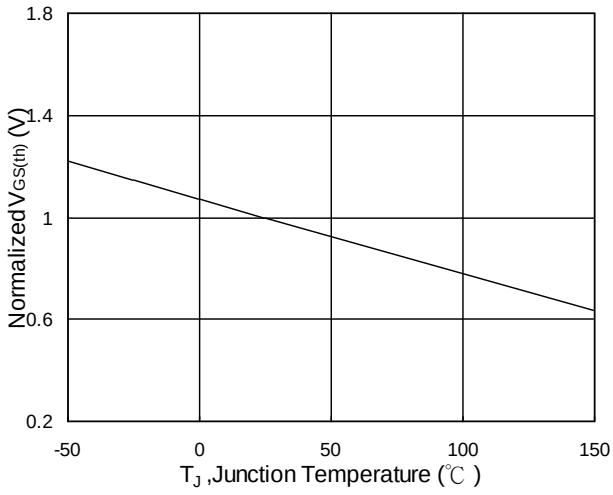


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

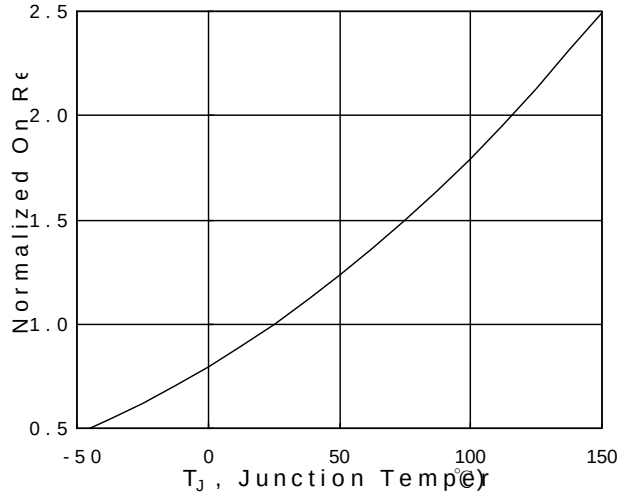


Fig.6 Normalized R_{DSON} vs. T_J

Ratings and Characteristic Curves

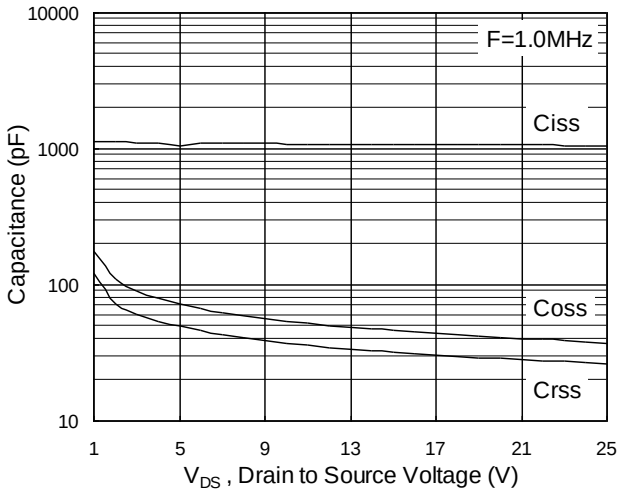


Fig.7 Capacitance

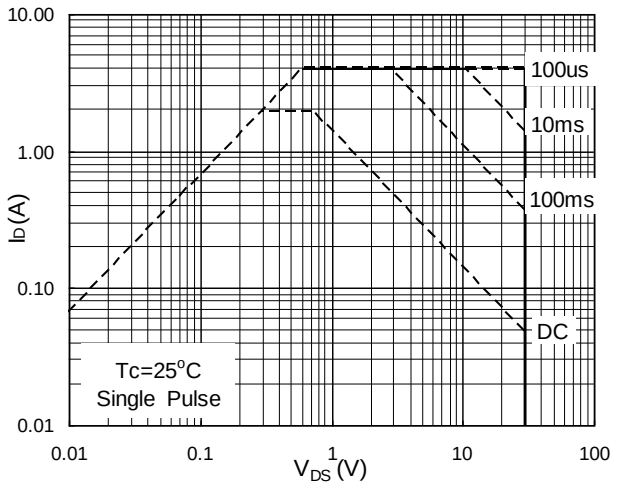


Fig.8 Safe Operating Area

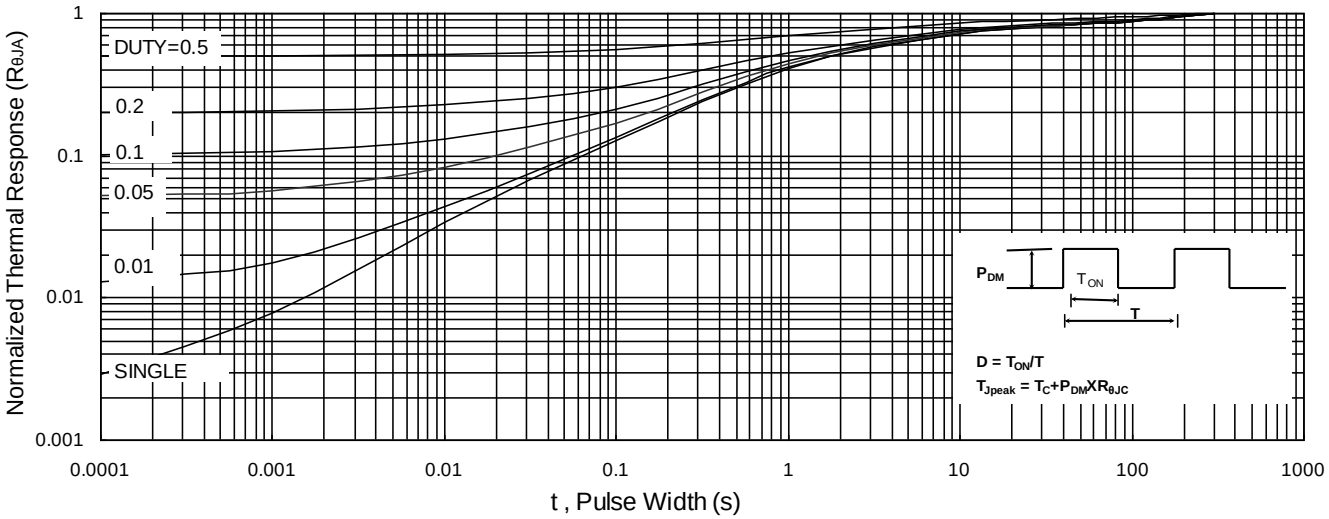


Fig.9 Normalized Maximum Transient Thermal Impedance

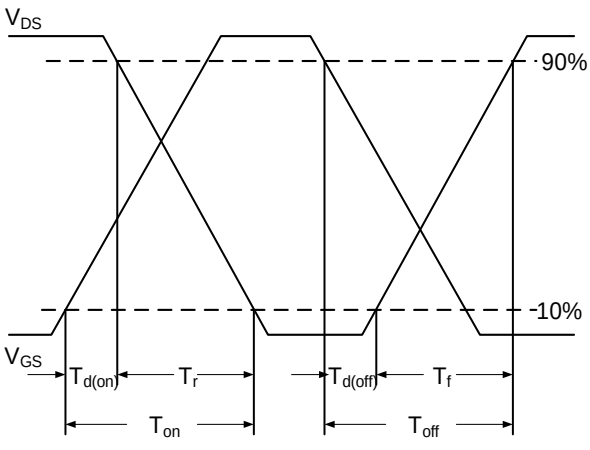


Fig.10 Switching Time Waveform

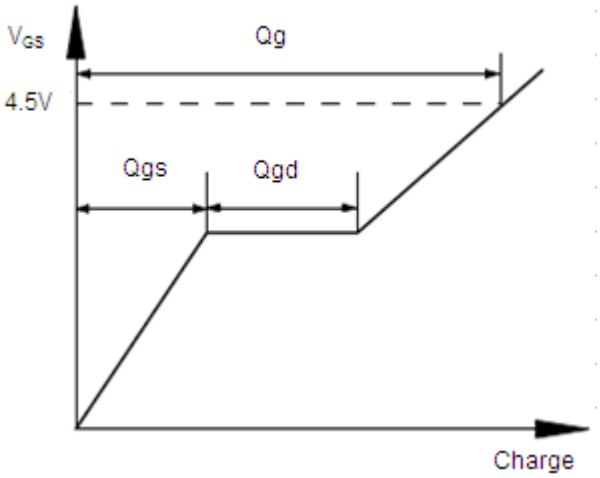
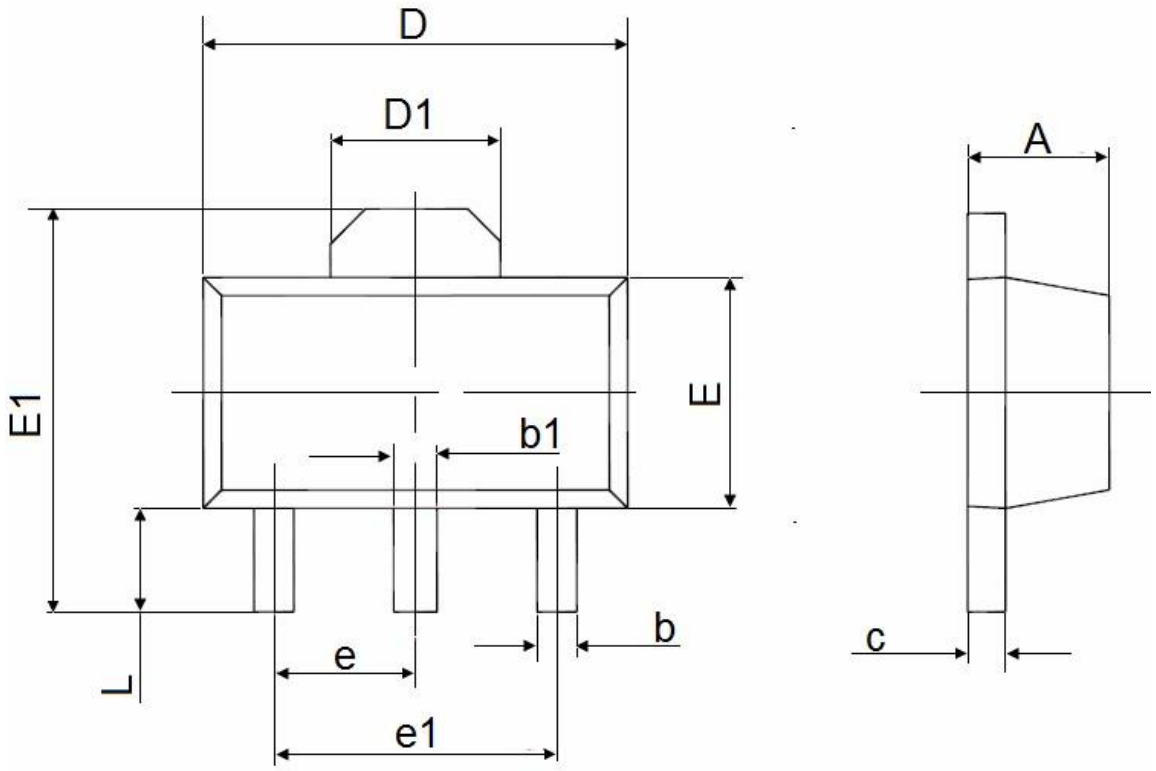


Fig.11 Gate Charge Waveform

Package Outline Dimensions Millimeters

SOT-89



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.400	1.600	0.055	0.063
b	0.320	0.520	0.013	0.020
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	2.300	2.600	0.091	0.102
E1	3.940	4.250	0.155	0.167
e	1.500 TYP.		0.060 TYP.	
e1	3.000 TYP.		0.118 TYP.	
L	0.900	1.200	0.035	0.047