

60V N-CHANNEL ENHANCEMENT MODE MOSFET

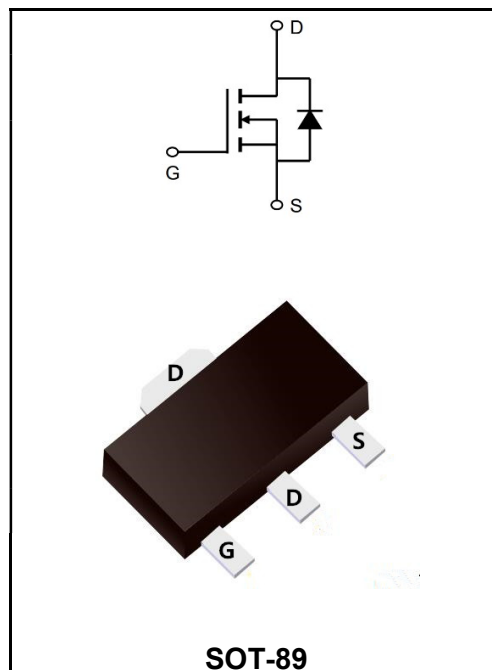
MAIN CHARACTERISTICS

I_D	5.8A
V_{DSS}	60V
$R_{DS(on)-typ}(@V_{GS}=10V)$	< 80mΩ (Type: 65 mΩ)



Application

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



Product Specification Classification

Part Number	Package	Marking	Pack
YFW5N06SI	SOT-89	YFW 5N06SI XXXXX	3000PCS/Tape

Maximum Ratings at $T_c=25^\circ\text{C}$ unless otherwise specified

Characteristics	Symbols	Value	Units
Drain-Source Voltage	V_{DS}	60	V
Gate - Source Voltage	V_{GS}	± 20	V
Continuous Drain Current, $V_{GS} @ 10V^1$ @ $T_c=25^\circ\text{C}$	I_D	5.8	A
Continuous Drain Current, $V_{GS} @ 10V^1$ @ $T_c=100^\circ\text{C}$	I_D	2.3	A
Pulsed Drain Current ²	I_{DM}	15	A
Single Pulse Avalanche Energy ³	E_{AS}	6.2	mJ
Avalanche Current	I_{AS}	10	A
Total Power Dissipation ⁴ @ $T_c=25^\circ\text{C}$	P_D	1.5	W
Storage Temperature Range	T_{STG}	-55 to +150	$^\circ\text{C}$
Operating Junction Temperature Range	T_J	-55 to +150	$^\circ\text{C}$
Thermal Resistance Junction-Ambient ¹	$R_{\theta JA}$	85	$^\circ\text{C/W}$
Thermal Resistance Junction-Case ¹	$R_{\theta JC}$	25	$^\circ\text{C/W}$

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}	60	64	-	V
BVDSS Temperature Coefficient	Reference to 25°C, $I_D=1mA$	$\Delta BV_{DSS}/\Delta T_J$	-	0.044	-	V/°C
Static Drain-Source On-Resistance ²	$V_{GS}=10V, I_D=10A$	$R_{DS(ON)}$	-	65	80	mΩ
	$V_{GS}=4.5V, I_D=5A$		-	75	90	
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		$\Delta V_{GS(th)}$	-	-4.8	-	mV/°C
Drain -Source Leakage Current	$V_{DS}=60V, V_{GS}=0V, T_J=25^\circ C$	I_{DSS}	-	-	1	μA
	$V_{DS}=60V, V_{GS}=0V, T_J=55^\circ C$		-	-	5	
Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	I_{GSS}	-	-	±100	nA
Total Gate Charge(10V)	$V_{DS}=30V$ $V_{GS}=10V$ $I_D=3A$	Q_g	-	51	-	nC
Gate-Source Charge		Q_{gs}	-	1.2	-	
Gate-Drain Charge		Q_{gd}	-	1.5	-	
Turn-on delay time	$V_{DD}=30V$ $V_{GS}=10V$ $R_G=1.0\Omega$ $I_D=1.5A$	$t_{d(on)}$	-	13	-	ns
Rise Time		T_r	-	51	-	
Turn-Off Delay Time		$t_{d(OFF)}$	-	15.2	-	
Fall Time		t_f	-	10.3	-	
Input Capacitance	$V_{DS}=30V$ $V_{GS}=0V$ $f=1.0MHz$	C_{iss}	-	330	-	pF
Output Capacitance		C_{oss}	-	65	-	
Reverse Transfer Capacitance		C_{rss}	-	46	-	
Continuous Source Current ^{1,5}	$V_G=V_D=0V$, Force Current	I_S	-	-	3	A
Pulsed Source Current ^{2,5}		I_{SM}	-	-	10	A
Diode Forward Voltage ²	$V_{GS}=0V, I_S=1A, T_J=25^\circ C$	V_{SD}	-	-	1.2	V
Reverse Recovery Time	$I_F=15A, dI/dt=100A/\mu s$, $T_J=25^\circ C$	t_{rr}	-	12.2	-	ns
Reverse Recovery Charge		Q_{rr}	-	7.3	-	nC

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 $\leq 300\mu s$, duty cycle $\leq 2\%$
- 3、The EAS data shows Max. rating . The test condition is $V_{DD}=25V, V_{GS}=10V, L=0.1mH, I_{AS}=10A$
- 4、The power dissipation is limited by 150°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

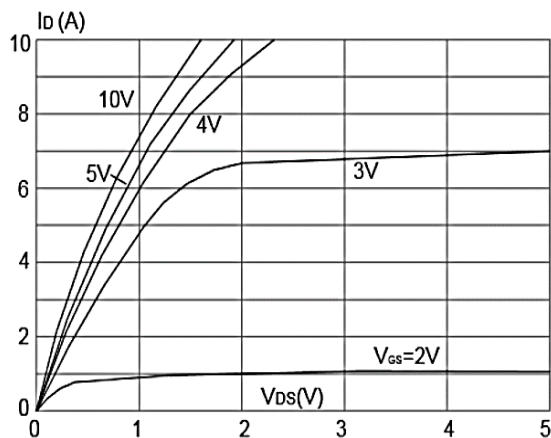


Figure1: Output Characteristics

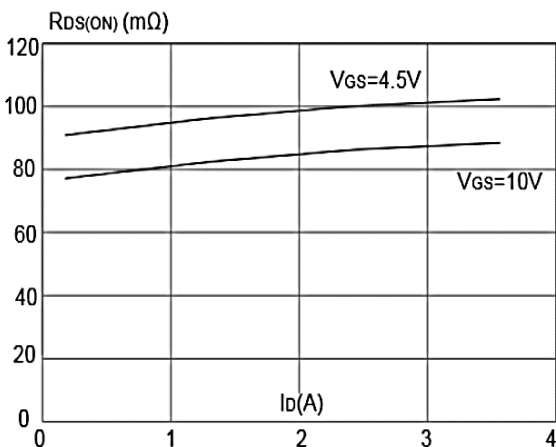


Figure 3: On-resistance vs. Drain Current

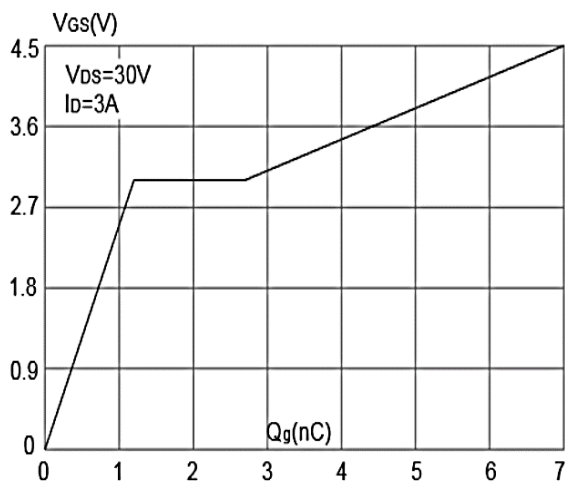


Figure 5: Gate Charge Characteristics

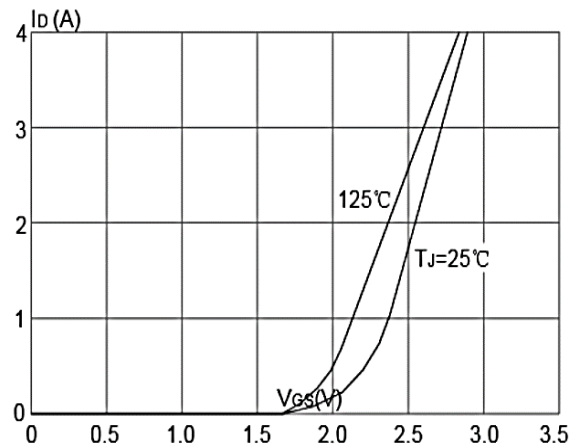


Figure 2: Typical Transfer Characteristics

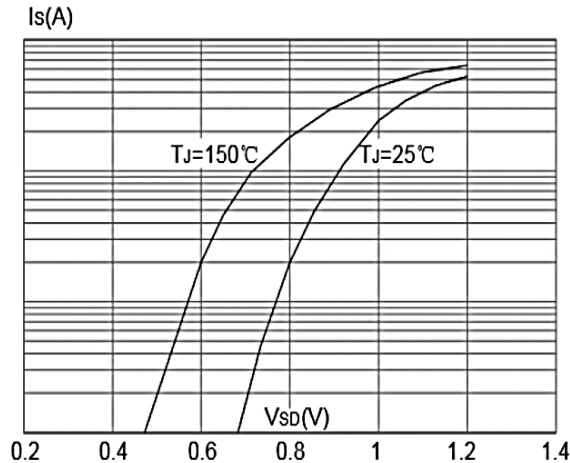


Figure 4: Body Diode Characteristics

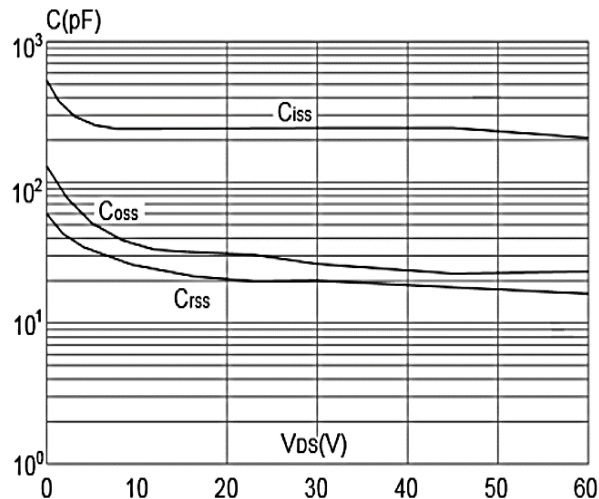


Figure 6: Capacitance Characteristics

Ratings and Characteristic Curves

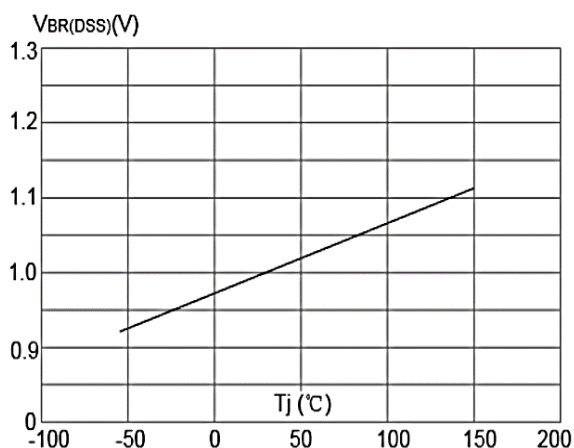


Figure 7: Normalized Breakdown Voltage vs Junction Temperature

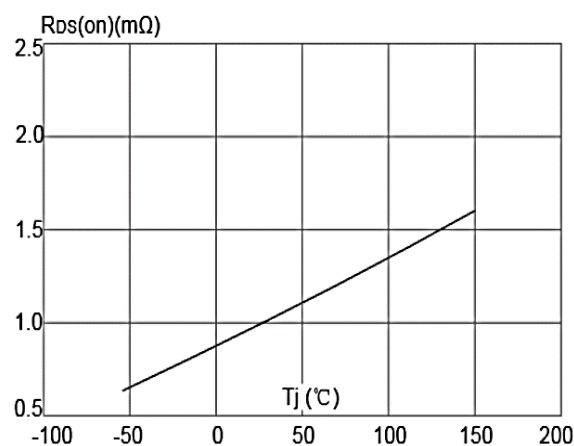


Figure 8: Normalized on Resistance vs. Junction Temperature

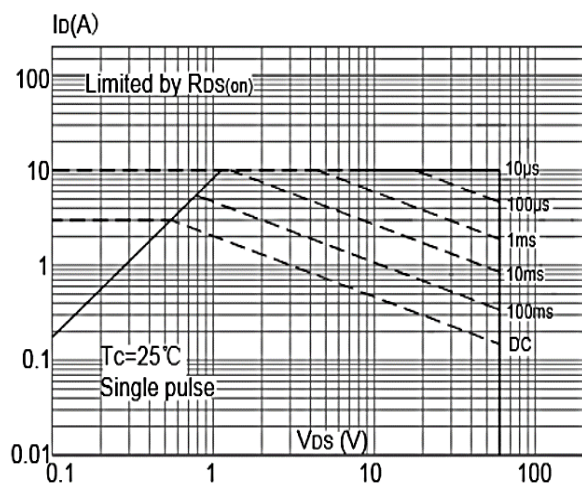


Figure 9: Maximum Safe Operating Area

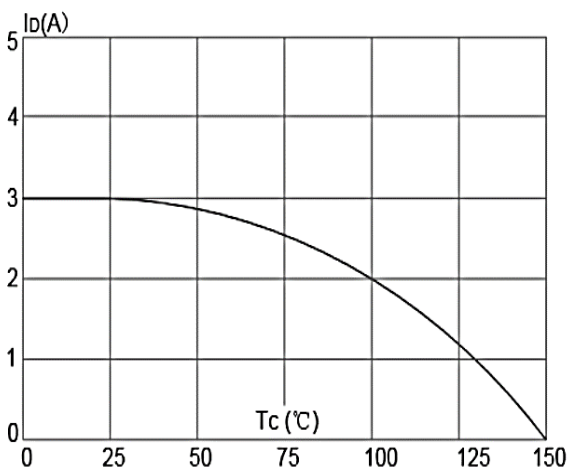


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

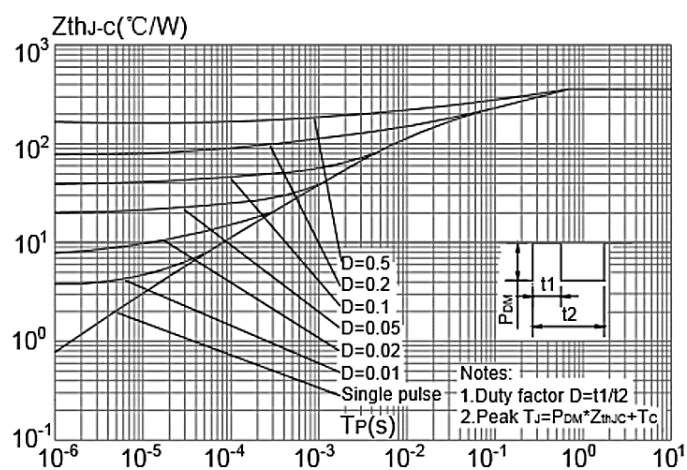
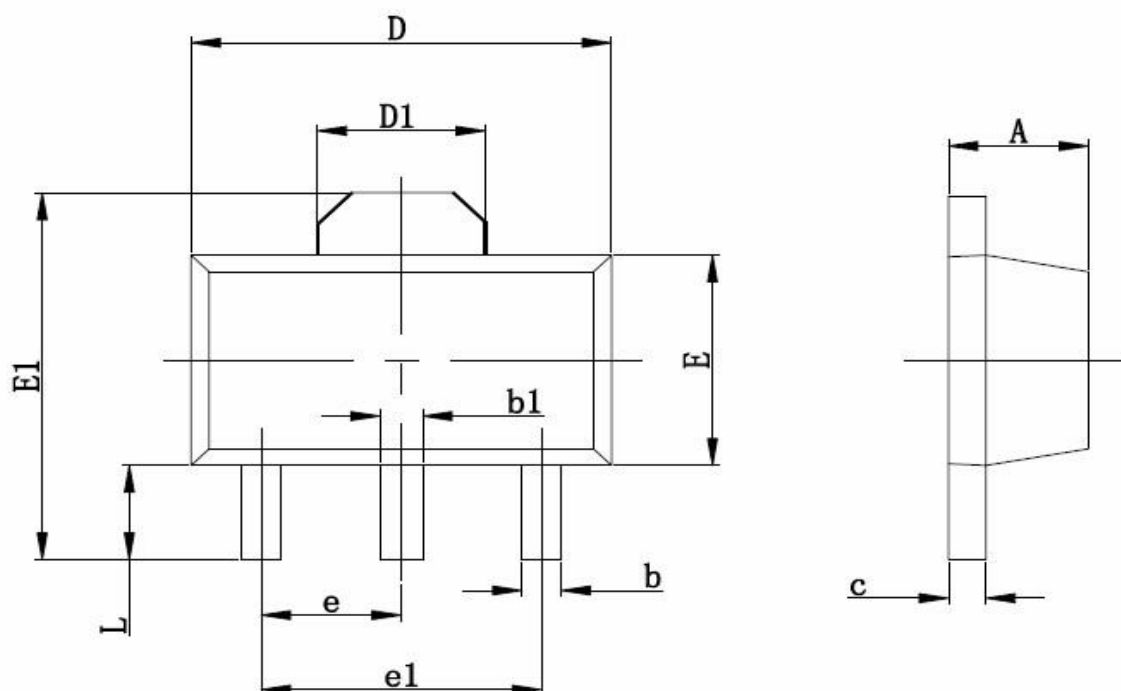


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambien

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