

20V N-CHANNEL ENHANCEMENT MODE MOSFET

MAIN CHARACTERISTICS

I_D	6.5A
V_{DS}	20V
$R_{DS(on)-typ}(@V_{GS}=4.5V)$	< 33m Ω (Type: 21 m Ω)

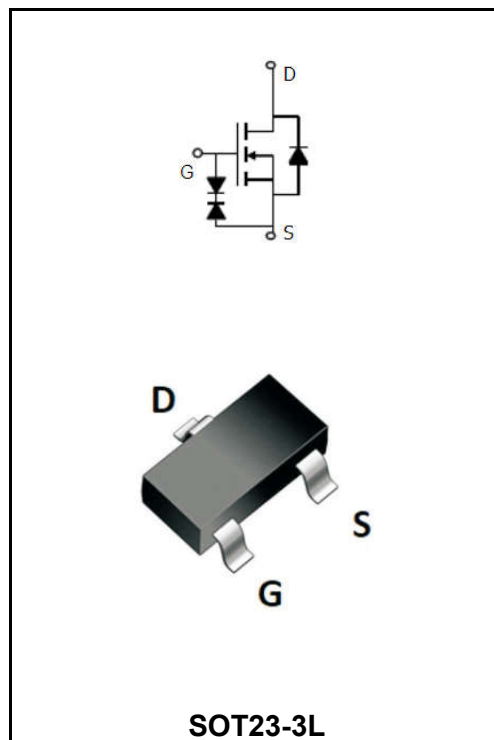
Features

◆ESD=2500HBM



Application

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



Product Specification Classification

Part Number	Package	Marking	Pack
YFW3416MI	SOT23-3L	3416	3000PCS/Tape

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Symbols	Value	Units
Drain-Source Voltage	V_{DS}	20	V
Gate - Source Voltage	V_{GS}	± 12	V
Drain Current-Continuous	I_D	6.5	A
Drain Current-Pulsed ^(Note 1)	I_{DM}	30	A
Maximum Power Dissipation	P_D	1.4	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C
Thermal Resistance, Junction-to-Ambient ^(Note 2)	$R_{\theta JA}$	89	°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}	20	-	-	V
Zero Gate Voltage Drain Current	$V_{DS}=20V, V_{GS}=0V$	I_{DSS}	-	-	1	μA
Gate-Body Leakage Current	$V_{GS}=\pm 10V, V_{DS}=0V$	I_{GSS}	-	-	± 10	μA
Gate -Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	$V_{GS(th)}$	0.45	0.7	1.0	V
Drain-Source On-State Resistance	$V_{GS}=4.5V, I_D=6.5A$	$R_{DS(on)}$	-	17	27	m Ω
	$V_{GS}=2.5V, I_D=5.5A$		-	21	33	
	$V_{GS}=1.8V, I_D=5A$		-	28	40	
Forward Transconductance	$V_{DS}=5V, I_D=6.5A$	g_{FS}	8	-	-	S
Input Capacitance	$V_{DS}=10V$ $V_{GS}=0V$ $f=1.0MHz$	C_{iss}	-	660	-	pF
Output Capacitance		C_{oss}	-	160	-	
Reverse Transfer Capacitance		C_{rss}	-	87	-	
Turn-on delay time	$V_{DD}=10V$ $R_L=1.5\Omega$ $V_{GS}=5V$ $R_{GEN}=3\Omega$	$t_{d(on)}$	-	0.5	-	ns
Turn-on Rise Time		T_r	-	1	-	
Turn-Off Delay Time		$t_{d(OFF)}$	-	12	-	
Turn-Off Fall Time		t_f	-	4	-	
Total Gate Charge	$V_{DS}=10V$ $I_D=6.5A$ $V_{GS}=4.5V$	Q_g	-	8	-	nC
Gate-Source Charge		Q_{gs}	-	2.5	-	
Gate-Drain Charge		Q_{gd}	-	3	-	
Diode Forward Voltage ^(Note 3)	$V_{GS}=0V, I_S=6.5A$	V_{SD}	-	-	1.2	V
Diode Forward Current ^(Note 2)		I_S	-	-	6.5	A

Notes:

Repetitive Rating: Pulse width limited by maximum junction temperature.

Surface Mounted on FR4 Board, $t \leq 10$ sec. Pulse Test:

Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.

Guaranteed by design, not subject to production

Ratings and Characteristic Curves

Typical Characteristics

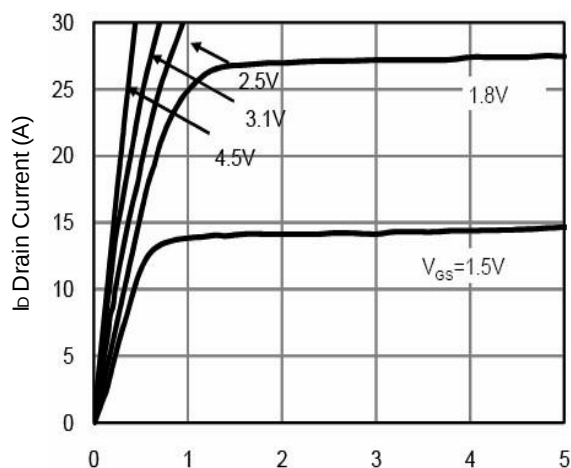


Fig.1 Typical Output Characteristics

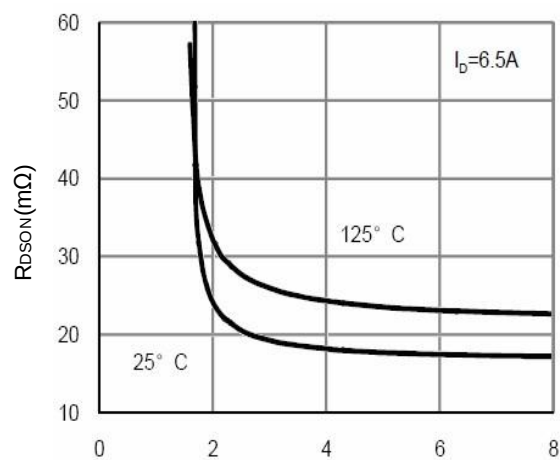


Fig.2 On-Resistance vs. Gate-Source

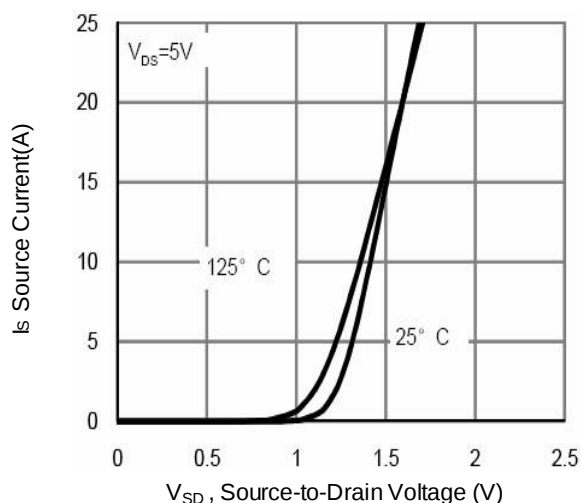


Fig.3 Forward Characteristics of Reverse

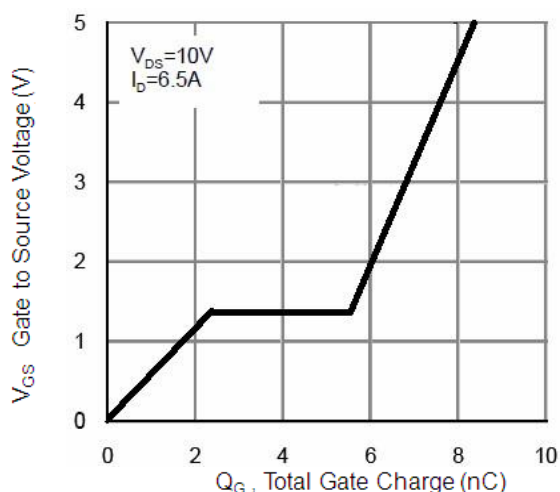


Fig.4 Gate-Charge Characteristics

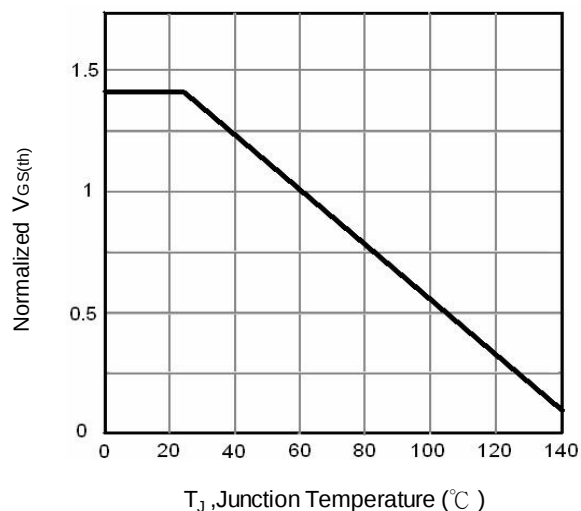


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

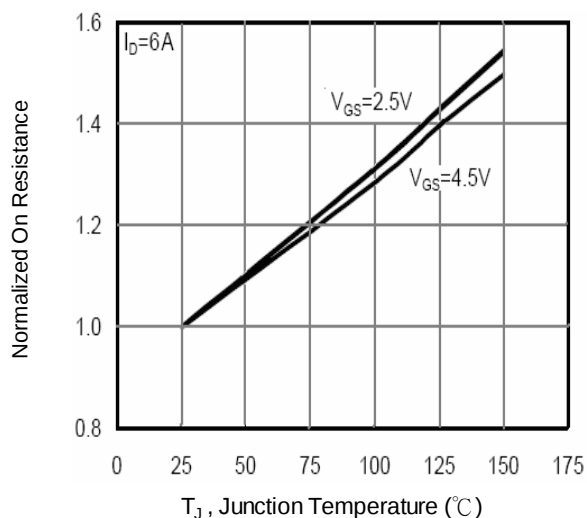


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

Ratings and Characteristic Curves

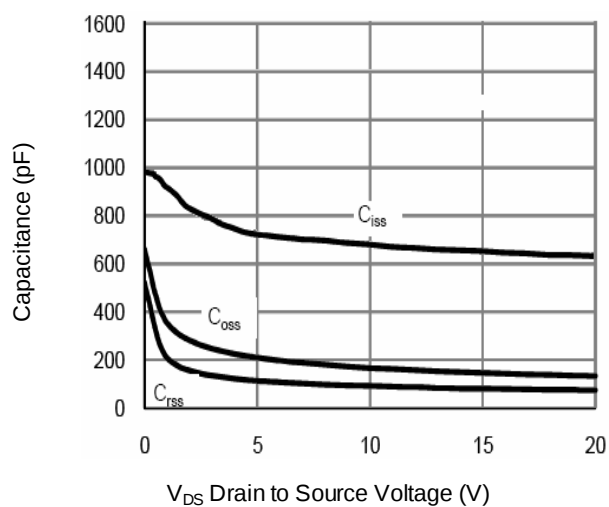


Fig.7 Capacitance

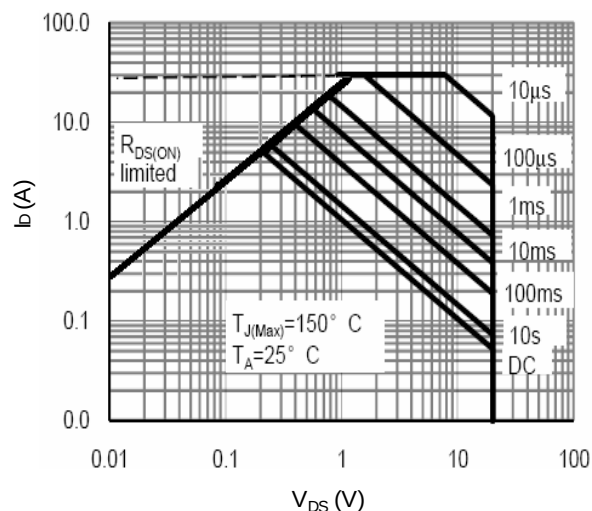


Fig.8 Safe Operating Area

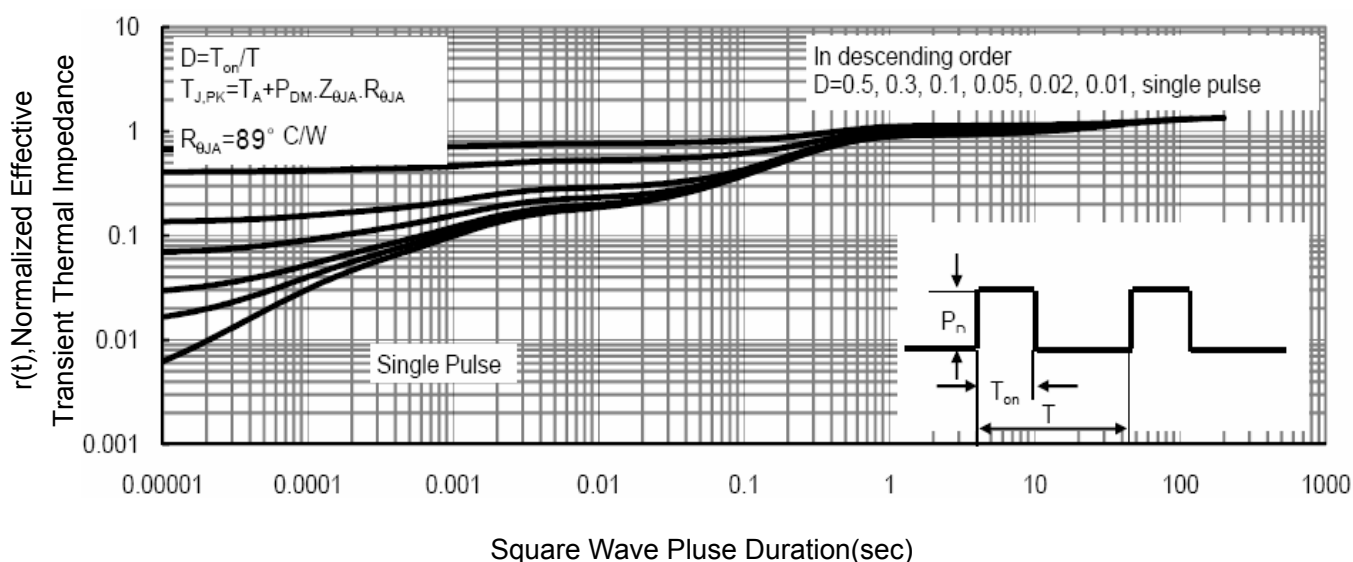


Fig.9 Normalized Maximum Transient Thermal Impedance

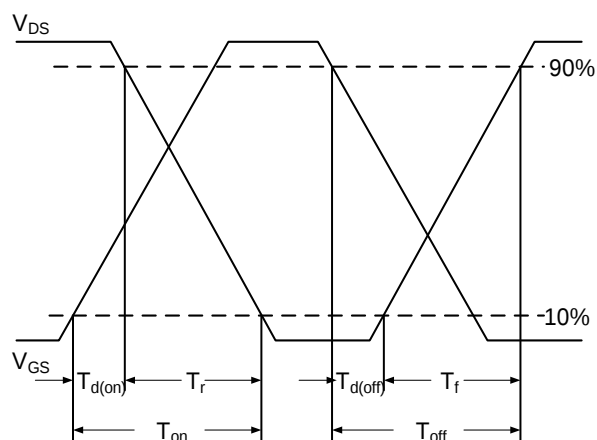


Fig.10 Switching Time Waveform

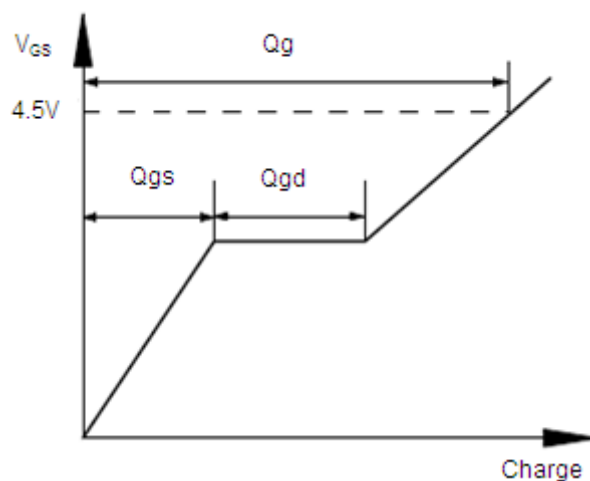
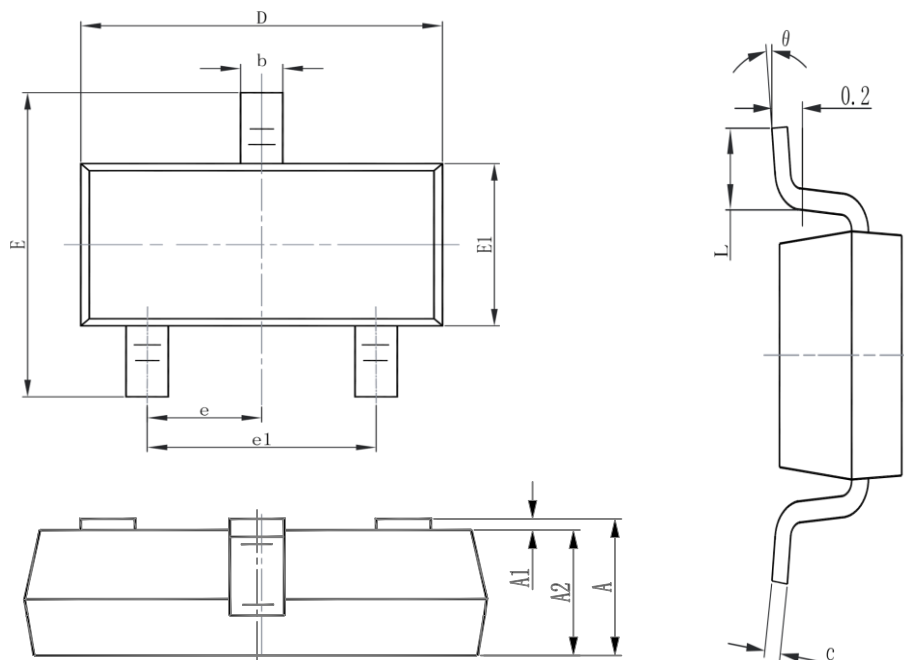


Fig.11 Gate Charge Waveform

SOT23-3L



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E1	1.500	1.700	0.059	0.067
E	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°