

200V N-CHANNEL ENHANCEMENT MODE MOSFET

MAIN CHARACTERISTICS

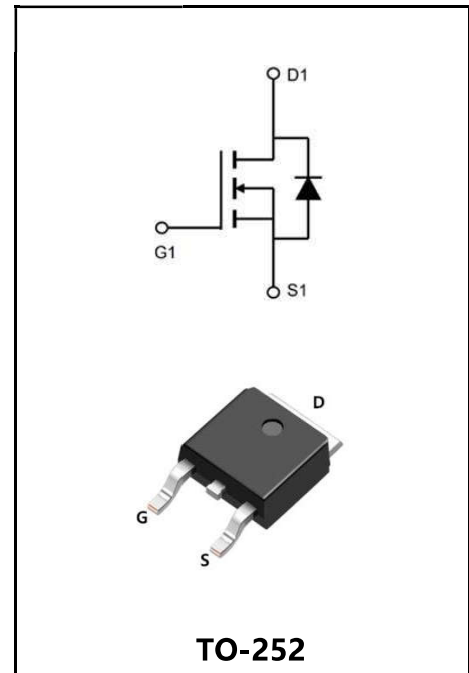
I_D	9A
V_{DSS}	200V
R_{DS(on)-typ}(@V_{GS}=10V)	<300mΩ (Type:250mΩ)

Application

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

Mechanical Data

- ◆ Case: Molded plastic
- ◆ Mounting Position: Any
- ◆ Molded Plastic: UL Flammability Classification Rating 94V-0
- ◆ Solder bath temperature 275°C maximum, 10s per JESD22-106



Product Specification Classification

Part Number	Part Number	Marking	Pack
YFW9N20AD	TO-252	YFW 9N20AD XXXXX	2500PCS/Tape

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Symbols	Value	Units
Drain-Source Voltage	VDS	200	V
Gate-Source Voltage	VGS	±20	V
Continue Drain Current	ID	9	A
Pulsed Drain Current (Note1)	IDM	36	A
Power Dissipation(Tc = 25°C)	PD	74	W
Single Pulse Avalanche Energy (Note2)	EAS	100	mJ
Avalanche Current (note1)	IAR	7.5	A
Repetitive Avalanche Energy note1)	EAR	8.1	mJ
Operating Temperature Range	TJ	-55 to +150	°C
Storage Temperature Range	TSTG	-55 to +150	°C
Thermal Resistance, Junction to Case	RθJC	1.7	°C/W
Thermal Resistance, Junction to Ambient	RθJA	62.5	°C/W

Electrical Characteristics at Tc=25°C unless otherwise specified

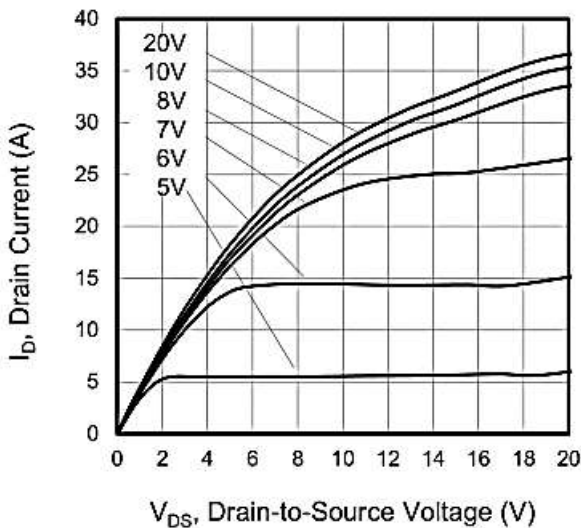
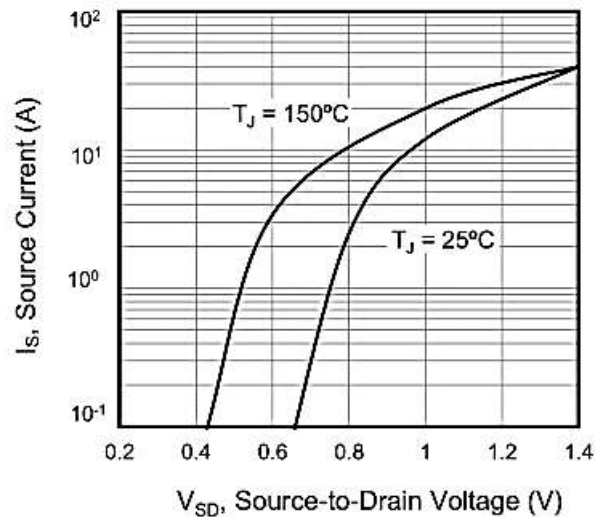
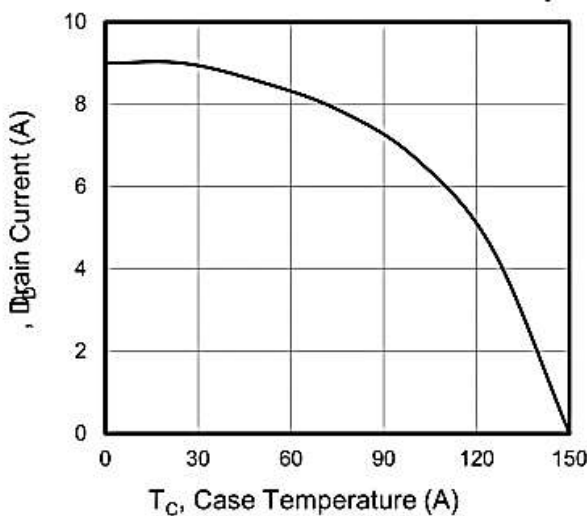
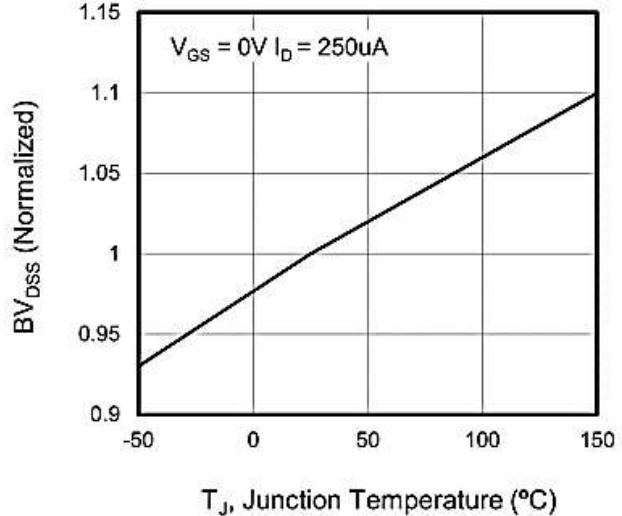
Characteristics	Test Condition	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS} = 0\text{ V}, I_D = 250\ \mu\text{A}$	BV_{DSS}	200	222	-	V
Drain-Source Leakage Current $T_J = 25^\circ\text{C}$	$V_{DS} = 200\text{ V}, V_{GS} = 0\text{ V}$	I_{DSS}	-	-	5	uA
	$T_J = 125^\circ\text{C}$ $V_{DS} = 160\text{ V}, V_{GS} = 0\text{ V}$		-	-	100	
Gate Leakage Current	$V_{GS} = \pm 20\text{ V}$	I_{GSS}	-	-	±100	nA
Gate-Source Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\ \mu\text{A}$	V_{GS(th)}	1.0	1.6	3.0	V
Drain-Source On-State Resistance	$V_{GS} = 10\text{ V}, I_D = 4.5\text{A}$	R_{DS(on)}	-	230	300	mΩ
Input Capacitance	$V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V},$ $f = 1\text{MHz}$	C_{iss}	-	684	-	pF
Output Capacitance		C_{oss}	-	103	-	
Reverse Transfer Capacitance		C_{rss}	-	37	-	
Turn-on Delay Time(Note2)	$I_D = 9\text{A}, V_{DD} = 100\text{ V},$ $R_G = 25\Omega$	t_{d(ON)}	-	12	-	nS
Rise Time(Note2)		t_r	-	22	-	
Turn-Off Delay Time(Note2)		t_{d(OFF)}	-	50	-	
Fall Time(Note2)		t_f	-	48	-	
Total Gate Charge(Note2)	$I_D = 9\text{ A}, V_{DD} = 160\text{ V},$ $V_{GS} = 10\text{ V}$	Q_G	-	23	-	nC
Gate to Source Charge(Note2)		Q_{GS}	-	2.5	-	
Gate to Drain Charge(Note2)		Q_{GD}	-	10	-	

Source-Drain Diode Characteristics at Ta=25°C unless otherwise specified

Characteristics	Test Condition	Symbol	Min.	Typ.	Max.	Unit
Maximun Body-Diode Continuous Current	$T_C = 25^\circ\text{C}$	I_S	-	-	9	A
Maximun Body-Diode Pulsed Current		I_{SM}	-	-	36	A
Drain-Source Diode Forward Voltage	$V_{GS} = 0\text{V}, I_{SD} = 9\text{A}, T_J = 25^\circ\text{C}$	V_{SD}	-	-	1.4	V
Reverse Recovery Time	$V_{GS} = 0\text{V}, I_S = 9\text{A}, diF/dt = 100\text{A}/\mu\text{s}$	t_{rr}	-	190	-	nS
Reverse Recovery Charge		Q_{rr}	-	1.7	-	μC

Note :

1. The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
2. The EAS data shows Max. rating . $I_{AS} = 7.5\text{A}, V_{DD} = 50\text{V}, R_G = 25\ \Omega$, Starting $T_J = 25^\circ\text{C}$
3. The test condition is Pulse Test: Pulse width $\leq 300\mu\text{s}$, Duty Cycle $\leq 1\%$
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

Figure 1. Output Characteristics ($T_J = 25^\circ\text{C}$)

Figure 2. Body Diode Forward Voltage

Figure 3. Drain Current vs. Temperature

Figure 4. BV_{DSS} Variation vs. Temperature

Ratings and Characteristic Curves

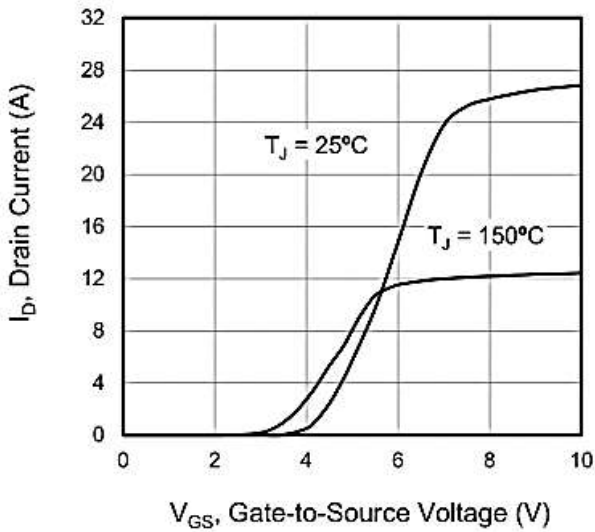


Figure 5. Transfer Characteristics

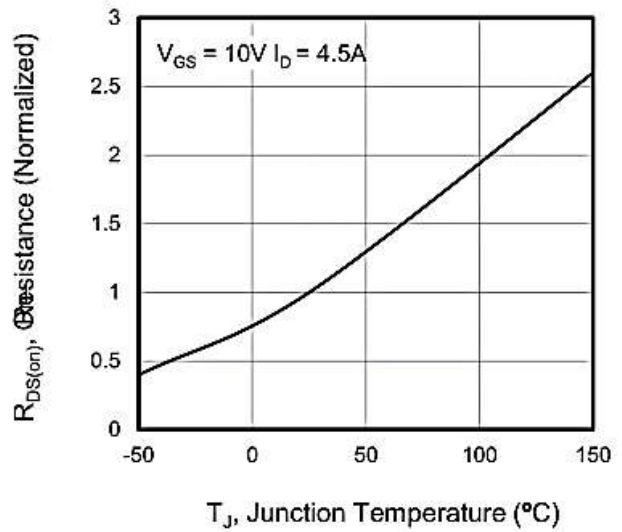


Figure 6. On-Resistance vs. Temperature

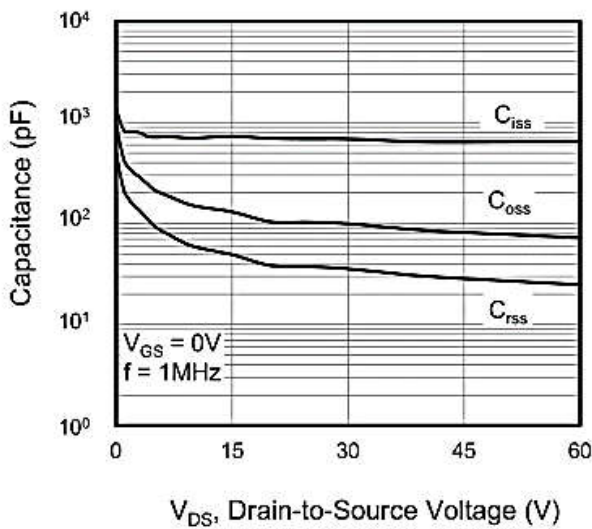


Figure 7. Capacitance

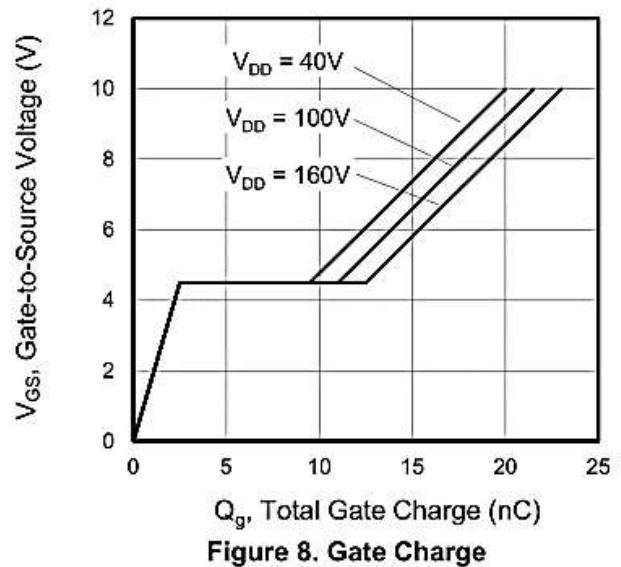


Figure 8. Gate Charge

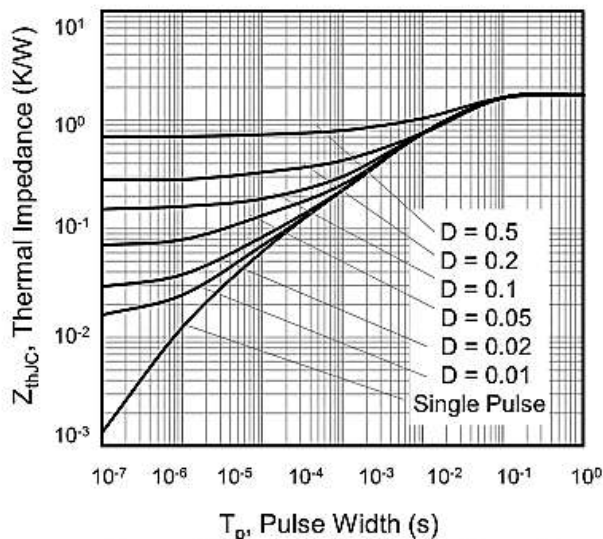


Figure 10. Transient Thermal Impedance

Package Outline Dimensions millimeters

TO-252

