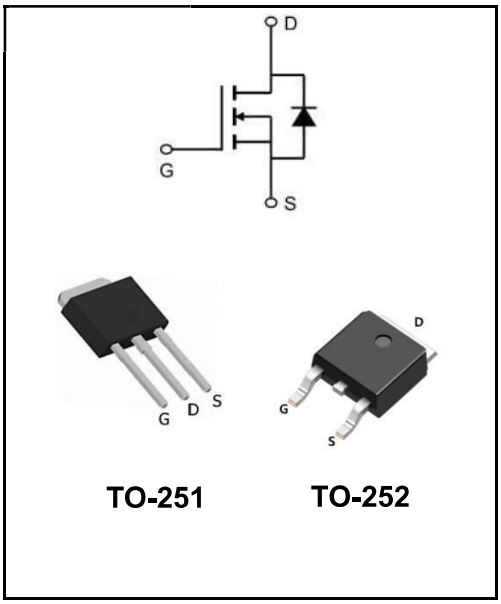
200V N-CHANNEL ENHANCEMENT MODE MOSFET

MAIN CHARACTERISTICS

I_D	5A
V_{DSS}	200V
R_{DSON}-typ(@V_{GS}=10V)	< 0.58Ω(Type:0.42Ω)



TO-251 TO-252

Application

- Uninterruptible Power Supply(UPS)
- Power Factor Correction (PFC)

Product Specification Classification

Part Number	Package	Marking	Pack
YFW5N20AD	TO-252	YFW 5N20AD XXXXX	2500PCS/Tape
YFW5N20AMJ	TO-251	YFW 5N20AMJ XXXXX	4000PCS/Tape

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Symbols	Value	Units
Drain-Source Voltage(V_{GS}=0V)	V_{DS}	200	V
Continuous Drain Current	I_D	5	A
Pulsed Drain Current	I_{DM}	20	A
Gate - Source Voltage	V_{GS}	±20	V
Single Pulse Avalanche Energy	E_{AS}	45	mJ
Avalanche Current	I_{AR}	3	A
Repetitive Avalanche Energy	E_{AR}	3.2	mJ
Power Dissipation (T_C=25℃)	P_D	46	W
Thermal Resistance, Junction-case	$R_{\theta JC}$	2.7	°C/W
Thermal Resistance, Junction ambient	$R_{\theta JA}$	60	°C/W
Operating Junction and Storage Temperature Range	T_J ,T_{STG}	-55 to +150	°C

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	V(BR)DSS	200	-	-	V
Zero Gate Voltage Drain Current	V_{DS}=200V , V_{GS}=0V , T_J= 25℃	I_{DSS}	-	-	5	μA
	V_{DS}=160V, V_{GS}=0V , T_J= 125℃		-	-	100	
Gate- Source Leakage	V_{GS}=±20V	I_{GSS}	-	-	±100	nA
Gate Source Threshold Voltage	V_{DS}= V_{GS}, I_D=250μA	$V_{GS(th)}$	1.2	1.5	2.5	V
Drain-Source On-Resistance (Note3)	V_{GS}=10V, I_D=2.5A	$R_{DS(ON)}$	-	0.42	0.58	Ω
Input Capacitance	V_{DS}=25V V_{GS}=0V f=1MHz	C_{iss}	-	228	-	pF
Output Capacitance		C_{oss}	-	48	-	
Reverse Transfer Capacitance		C_{rss}	-	17	-	
Total Gate Charge	V_{DD}=160V I_D=5A V_{GS}=10V	Q_g	-	18	-	nC
Gate-Source Charge		Q_{gs}	-	1.5	-	
Gate-Drain Charge		Q_{gd}	-	9.5	-	
Turn-on delay time	V_{DD}=100V I_D=5A R_G=25Ω	$t_{d(on)}$	-	10	-	ns
Turn-on Rise Time		T_r	-	19	-	
Turn-Off Delay Time		$t_{d(OFF)}$	-	43	-	
Turn-on Fall Time		t_f	-	32	-	
Continuous Body Diode Current	T_C= 25℃	I_S	-	-	5	A
Pulsed Diode Forward Current		I_{SM}	-	-	20	A
Body Diode Voltage	V_{GS}=0V , I_{SD}=5A , T_J= 25℃	V_{SD}	-	-	1.4	V
Reverse Recovery Time	V_{GS}=0V, I_S=5A, dI_{SD}/dt=100A/μs	t_{rr}	-	160	-	ns
Reverse Recovery Charge		Q_{rr}	-	1.5	-	nC

Note :
1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. IAS = 3A, VDD = 50V, RG = 25 Ω, Starting TJ = 25 °C
3. Pulse Test: Pulse width ≤ 300μs, Duty Cycle ≤ 1%

Ratings and Characteristic Curves

Typical Characteristics

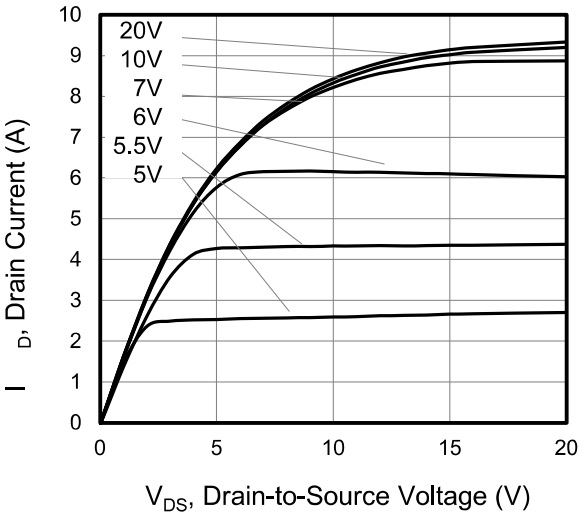


Figure 1. Output Characteristics (T_J = 25ºC)

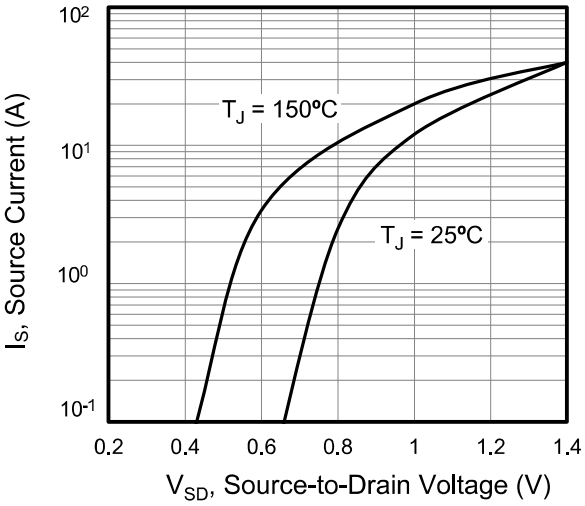


Figure 2. Body Diode Forward Voltage

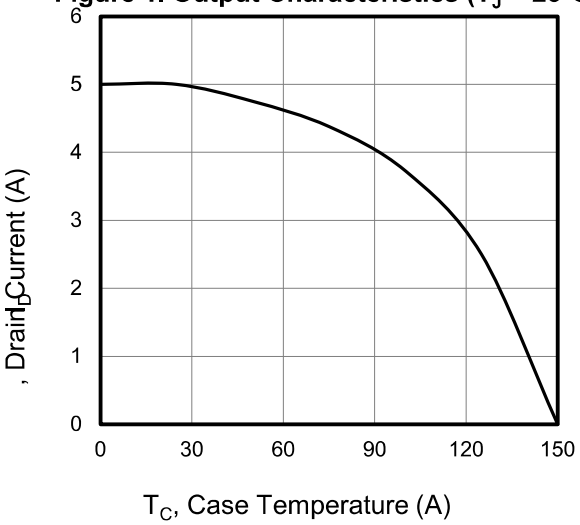


Figure 3. Drain Current vs. Temperature

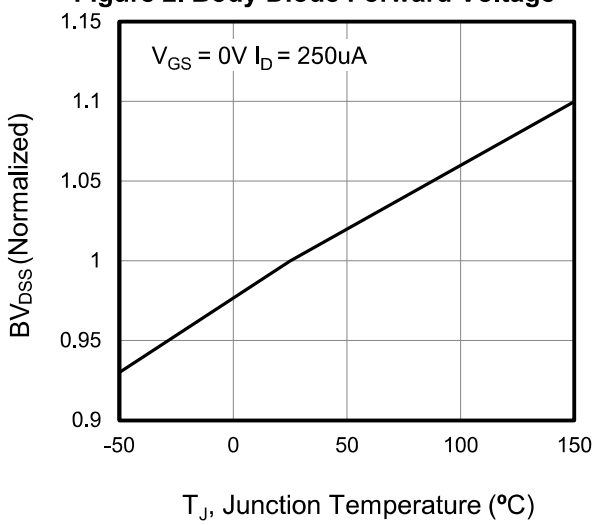


Figure 4. BV_{DSS} Variation vs. Temperature

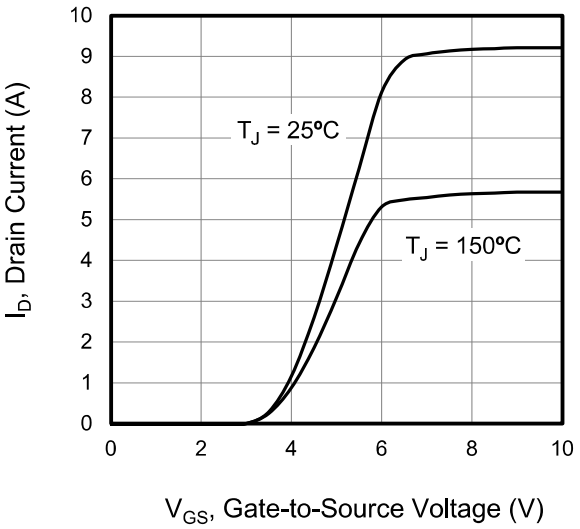


Figure 5. Transfer Characteristics

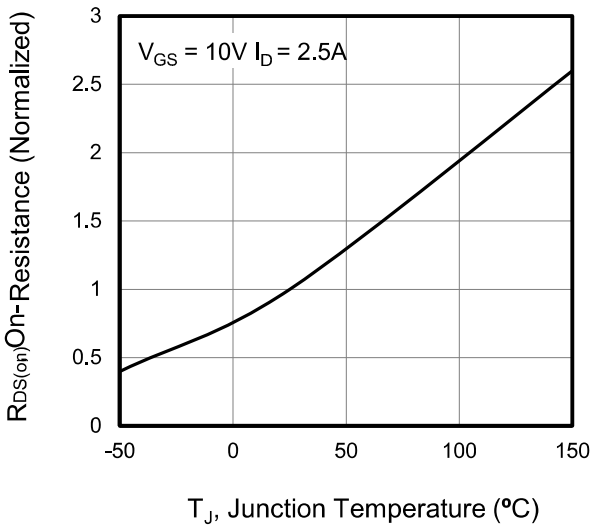


Figure 6. On-Resistance vs. Temperature

Ratings and Characteristic Curves

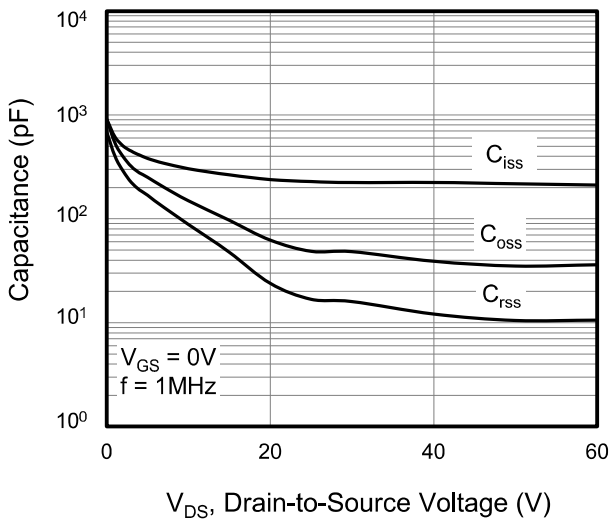


Figure 7. Capacitance

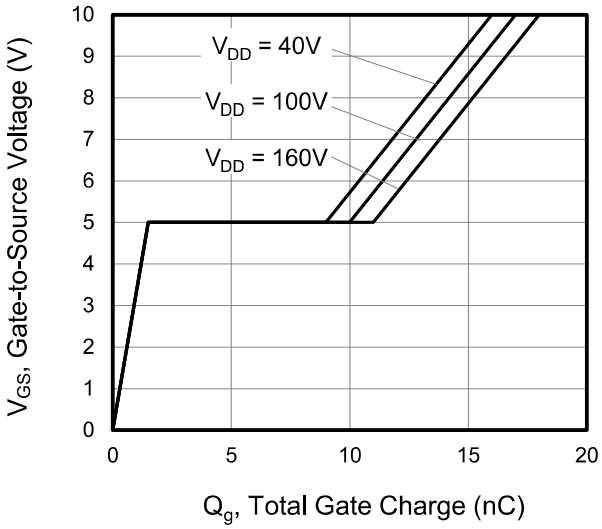


Figure 8. Gate Charge

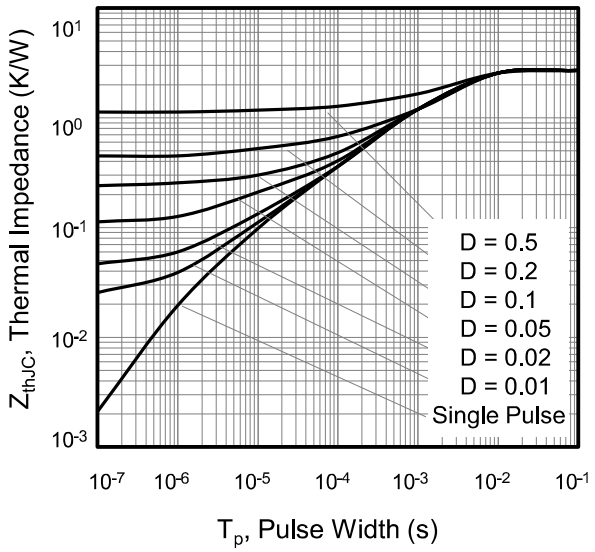


Figure 10. Transient Thermal Impedance

Ratings and Characteristic Curves

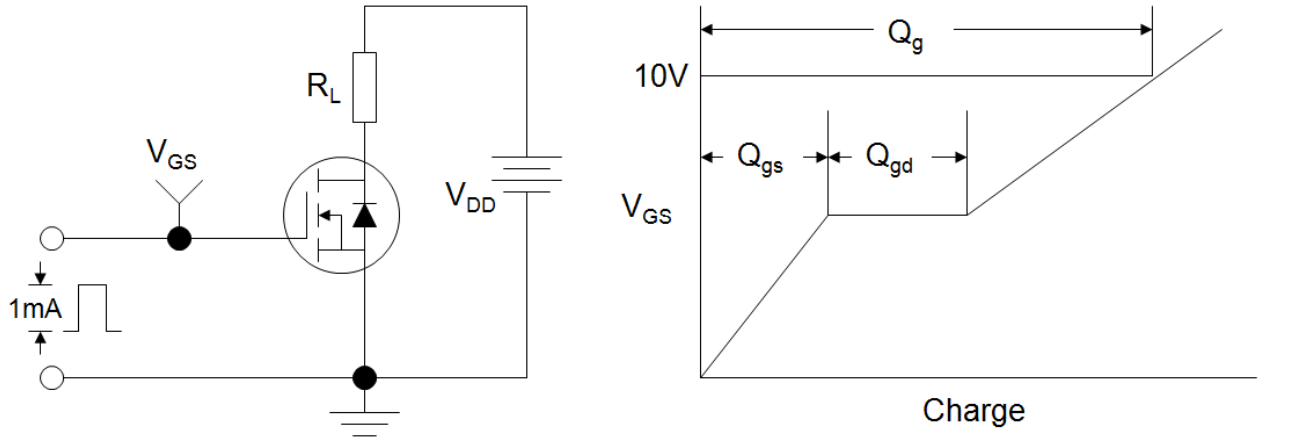


Figure A: Gate Charge Test Circuit and Waveform

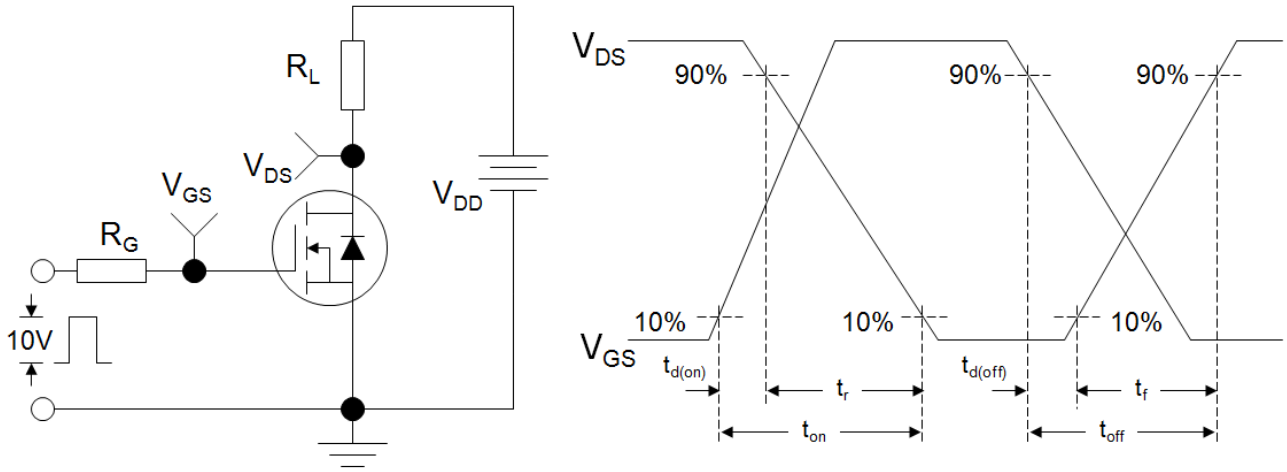


Figure B: Resistive Switching Test Circuit and Waveform

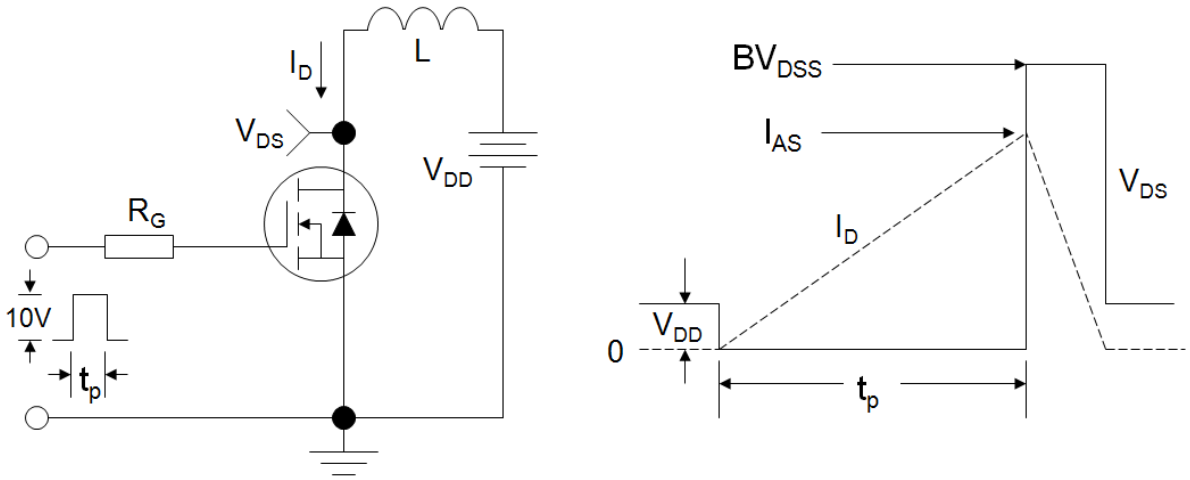


Figure C: Unclamped Inductive Switching Test Circuit and Waveform

Package Outline Dimensions Millimeters

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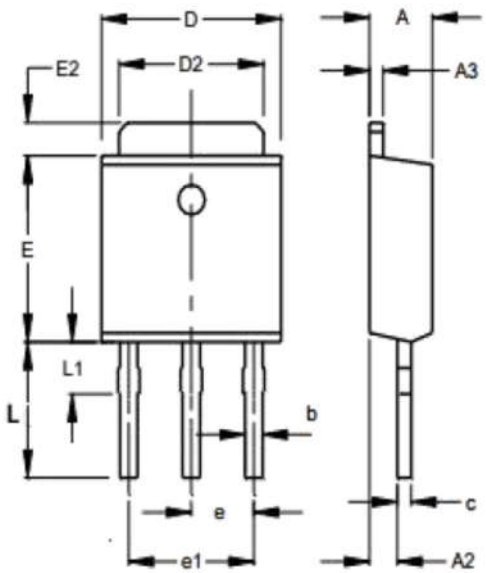

Dim.	Min.	Max.
A	2.2	2.4
A2	0.95	1.15
A3	0.45	0.65
b	0.65	0.85
c	0.45	0.55
D	6.45	6.75
D2	5.2	5.4
E	5.8	6
E2	0.95	1.25
e	Typ 2.3	
e1	Typ 4.6	
L	4	4.2
L1	1.2	1.5

All Dimensions in millimeter

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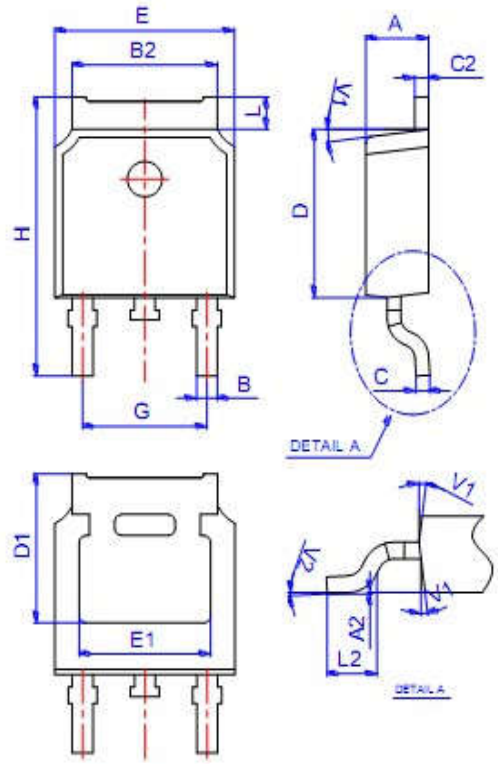

Dim.	Min.	Typ.	Max.
A	2.10	-	2.50
A2	0	-	0.10
B	0.66	-	0.86
B2	5.18	-	5.48
C	0.40	-	0.60
C2	0.44	-	0.58
D	5.90	-	6.30
D1	5.30REF		
E	6.40	-	6.80
E1	4.63	-	-
G	4.47	-	4.67
H	9.50	-	10.70
L	1.09	-	1.21
L2	1.35	-	1.65
V1	-	7°	-
V2	0°	-	6°

All Dimensions in millimeter