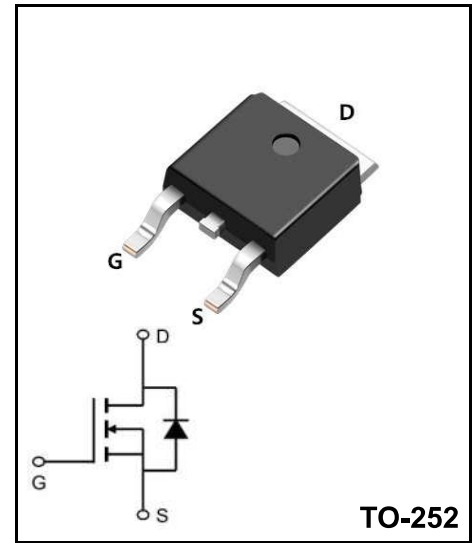


60V N-Channel Enhancement Mode Power MOSFET

MAIN CHARACTERISTICS

I_D	20A
V_{DSS}	60V
R_{DS(on)-typ(@V_{GS}=10V)}	< 30mΩ (Type: 20 mΩ)



Applications

- ◆ Power Switching Application
- ◆ Load Switching
- ◆ Power supply

General Description

- ◆ Advanced Trench power MOSFET technology
- ◆ Low drain-source on-resistance
- ◆ Low gate Charge
- ◆ High-speed switching

Product Specification Classification

Part Number	Package	Marking	Pack
YFW20N06AD	TO-252	YFW 20N06AD XXXXX	2500PCS/Tape

Absolute Maximum Ratings

Characteristics	Symbol	Value	Unit
Drain-Source Voltage	V _{DSS}	60	V
Continuous drain current (T _C = 25°C) (T _C = 100°C)	I _D	20	A
		14	A
Drain current (Pulsed) ¹⁾	I _{DM}	60	A
Gate-Source voltage	V _{GS}	±20	V
Avalanche energy, single pulse ²⁾	E _{AS}	72	mJ
Power Dissipation (T _C = 25°C)	P _d	52	W
Operating junction and storage temperature range	T _J , T _{STG}	175, -55 to +175	°C

Thermal Characteristics

Characteristics	Symbol	Value	Unit
Thermal resistance, Junction-to-case	R _{θJC}	3.3	°C/W
Thermal resistance, Junction-to-ambient	R _{θJA}	60	°C/W

Electrical Characteristics (Tc = 25°C unless otherwise specified)

Characteristics	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static characteristics						
Drain-source breakdown voltage	V_{DSS}	$V_{GS}=0\text{ V}, I_D=0.25\text{mA}$	60			V
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=0.25\text{ mA}$	1.2	1.7	2.5	V
Drain cut-off current	I_{DSS}	$V_{DS}=60\text{ V}, V_{GS}=0\text{ V},$			1.0	μA
Gate leakage current	I_{GSS}	$V_{GS}=20\text{ V}, V_{DS}=0\text{ V}$			100	nA
		$V_{GS}=-20\text{V}, V_{DS}=0\text{V}$			-100	nA
Drain-source on-state resistance	$R_{DS(on)}$	$V_{GS}=10\text{ V}, I_D=20\text{A}$		20	30	m Ω
		$V_{GS}=4.5\text{V}, I_D=10\text{A}$		25	38	m Ω
Dynamic characteristics						
Input capacitance	C_{iss}	$V_{DS}=30\text{V}, V_{GS}=0\text{ V},$ $f=1\text{ MHz}$		1100		pF
Output capacitance	C_{oss}			106		
Reverse transfer capacitance	C_{rss}			58.5		
Turn-on delay time	$t_{d(on)}$	$V_{DS}=30\text{V}, V_{GS}=10\text{V}, R_g=3\Omega$		7		ns
Rise time	t_r			20		
Turn-off delay time	$t_{d(off)}$			16		
Fall time	t_f			23		
Gate charge characteristics						
Gate to source charge	Q_{gs}	$V_{DS}=15\text{V}, I_D=15\text{A}$ $V_{GS}=10\text{V}$		4.5		nC
Gate to drain charge	Q_{gd}			6.5		
Gate charge total	Q_g			25		
Reverse diode characteristics						
Diode forward Current	I_s				20	A
Diode forward voltage	V_{SD}	$V_{GS}=0\text{ V}, I_s=10\text{A}$			1.2	V
Reverse recovery time	t_{rr}	$I_F=10\text{ A},$ $di/dt=100\text{A}/\mu\text{s}$		36		ns
Reverse recovery charge	Q_{rr}			6.3		nC

Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. EAS condition, $L=1\text{mH}, I_{AS} = 11\text{A}, V_{DD}=10\text{V}.$

Characteristics Curves

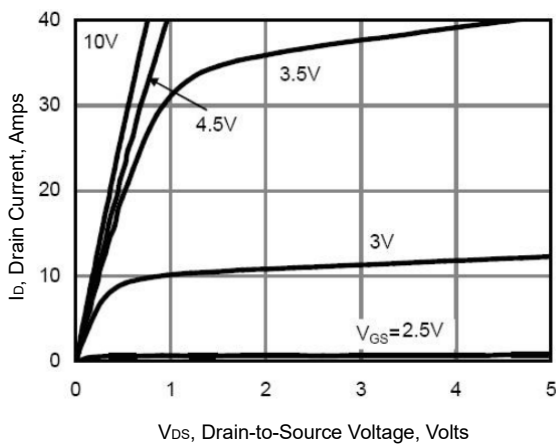


Figure 1 Typical Output Characteristics

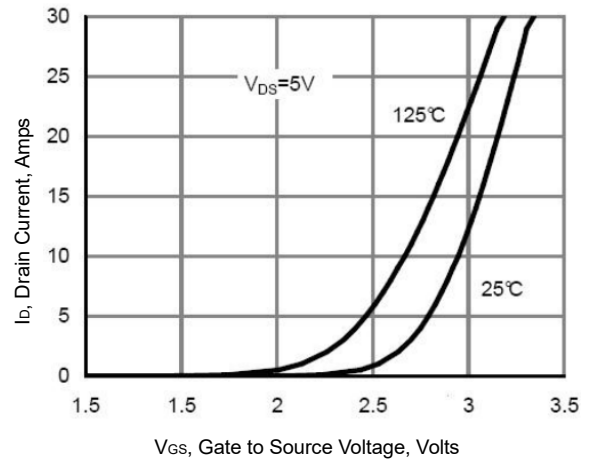


Figure 2 Typical Transfer Characteristics

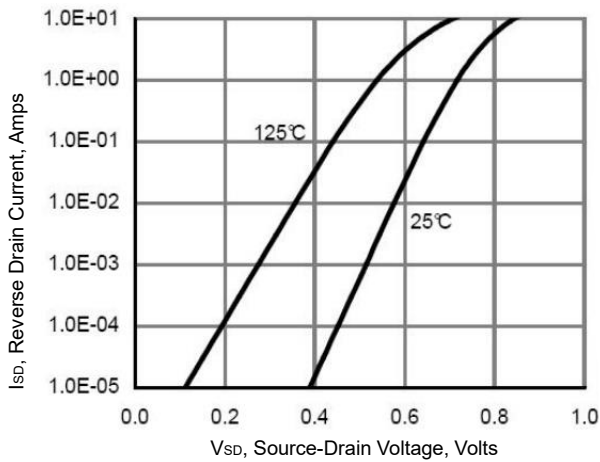


Figure 3 Typical Body Diode Transfer Characteristics

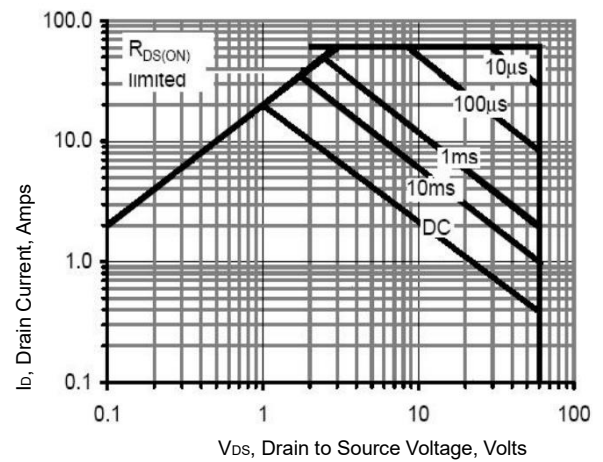


Figure 4 Maximum Forward Biased Safe Operating Area

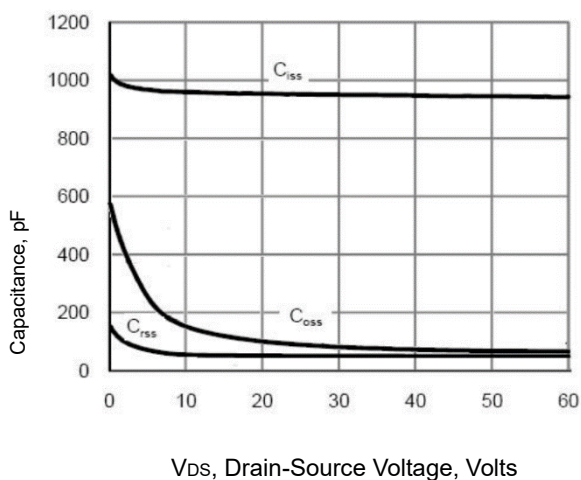


Figure 5 Typical Capacitance vs. Drain to Source Voltage

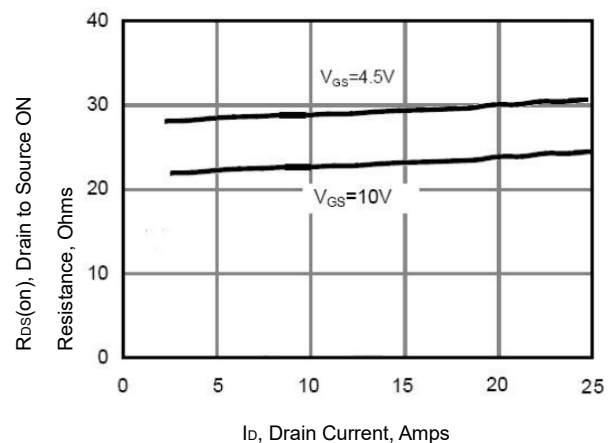


Figure 6 Typical Drain to Source ON Resistance vs. Drain Current

Characteristics Curves

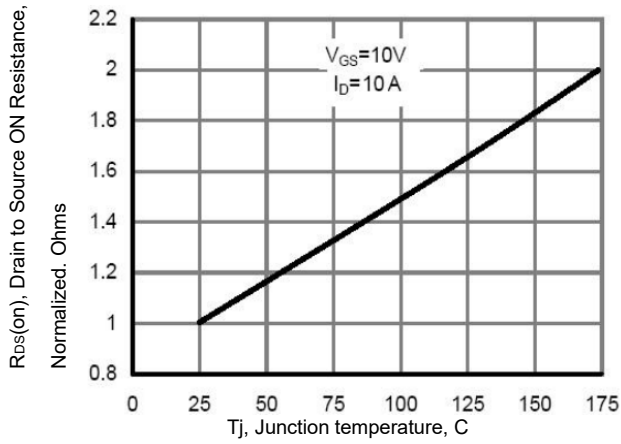


Figure 7 Typical Drain to Source on Resistance vs. Junction Temperature

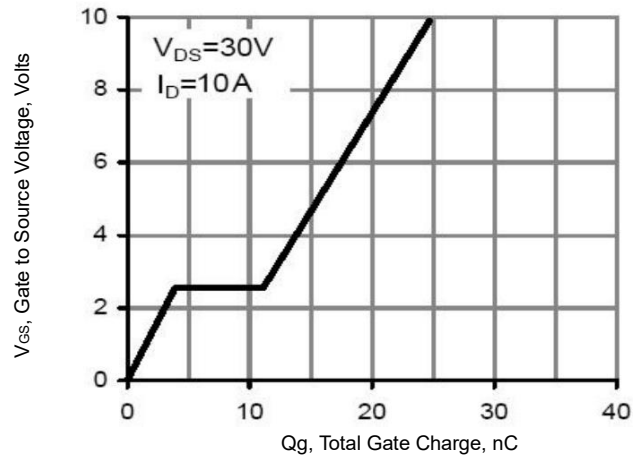


Figure 8 Typical Gate Charge vs. Gate to Source

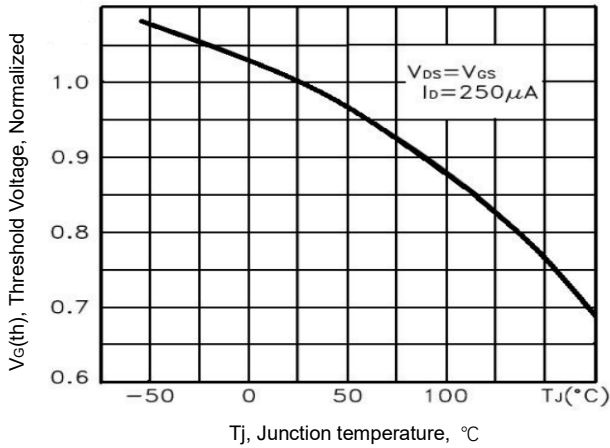


Figure 9 Typical Threshold Voltage vs. Junction Temperature

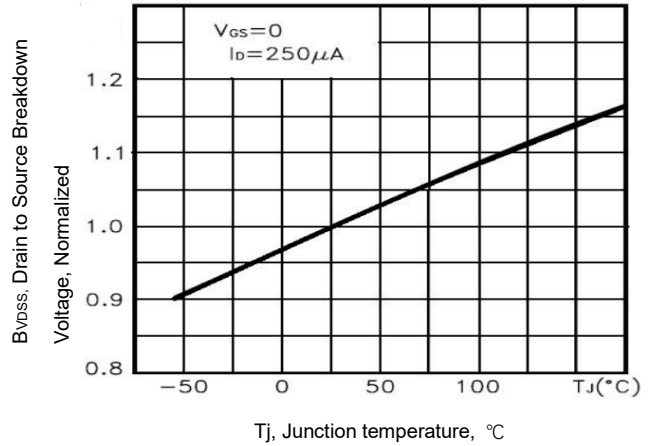


Figure 10 Typical Breakdown Voltage vs. Junction Temperature

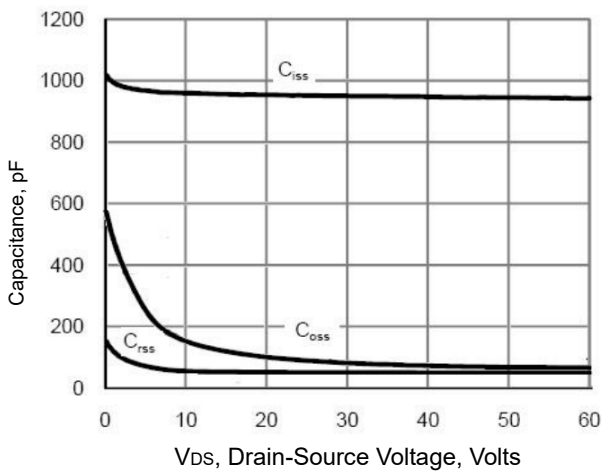


Figure 11 Typical Capacitance vs. Drain to Source Voltage

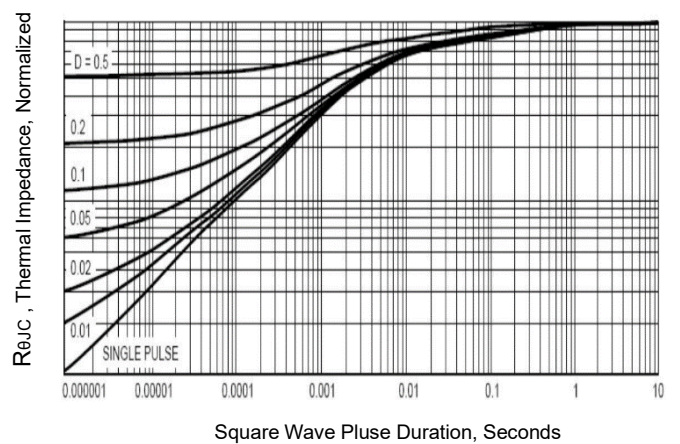


Figure 12 Normalized Maximum Transient Thermal Impedance

Test Circuit

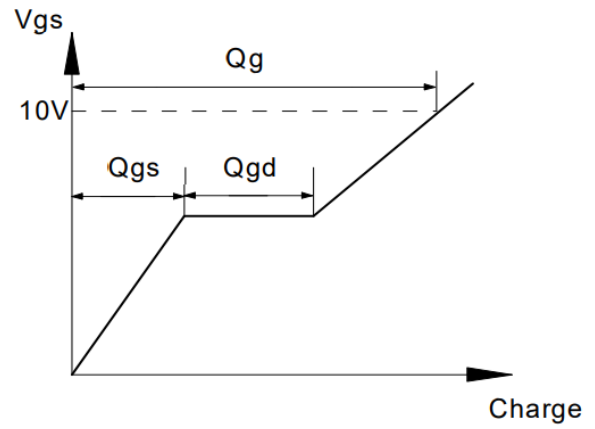
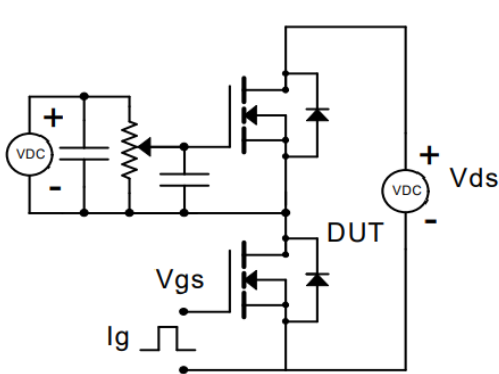


Figure 1: Gate Charge Test Circuit and Waveforms

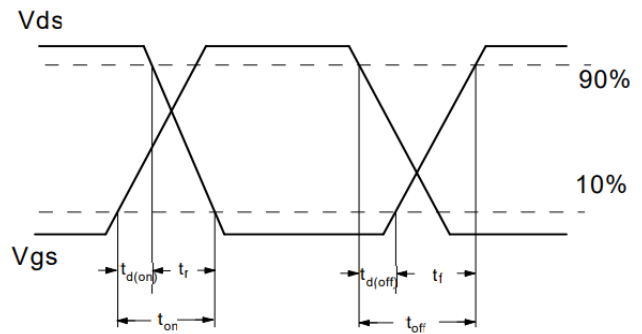
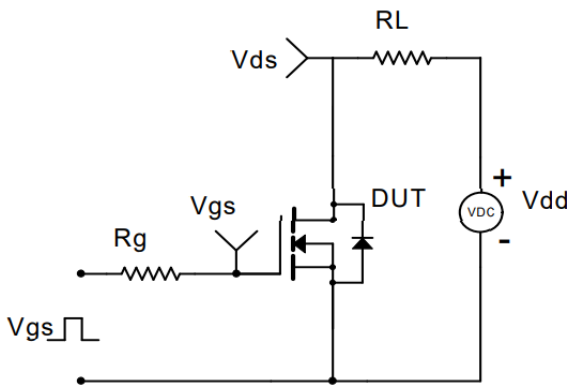


Figure 2: Resistive Switching Test Circuit & Waveforms

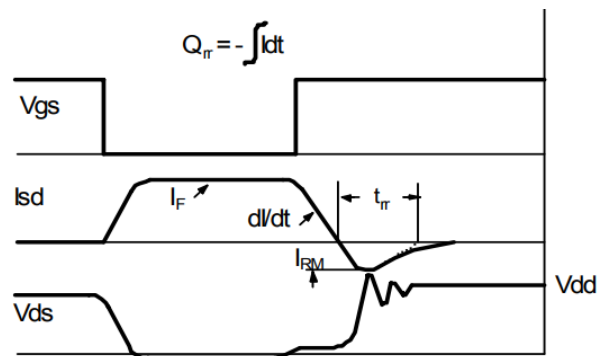
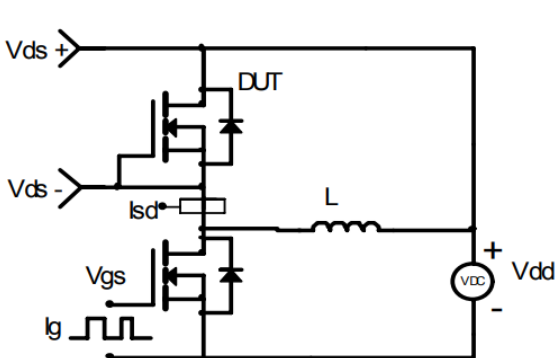


Figure 3: Diode Recovery Test Circuit & Waveforms

Package Dimensions

