

N-Channel MOSFET

$V_{DSS}=650V, I_D=12A, R_{DS(ON)}=0.82\Omega(\max)$

Features

- $R_{DS(ON)} = 0.82\Omega @ V_{GS} = 30V$
- Ultra Low Gate Charge
- Low Reverse Transfer Capacitance
- Fast Switching Capability
- Avalanche Energy Specified
- Improved dv/dt Capability, High Ruggedness

Applications

- High Frequency Switching Mode Power Supply
- Electronic Lamp Ballasts Based on Half Bridge
- LED Power Supplies

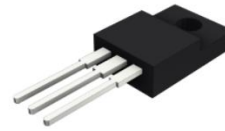
Mechanical Data

- Case: ITO-220AB Package
- Case Material: "Green" Molding Compound
UL Flammability Classification Rating 94V-0
- Halogen Free

Ordering Information

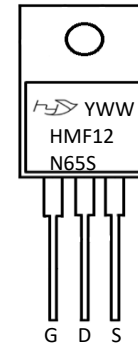
- Package : ITO-220AB
- Quantity Per Tube : 50 pcs

Package Outline

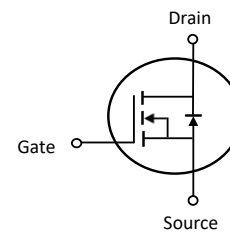


ITO-220AB Top View

Marking Information



Device Schematic



Maximum Ratings (@ $T_A = +25^\circ C$, unless otherwise specified.)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	650	V
Gate-Source Voltage	V_{GSS}	± 30	V
Avalanche Current (Note 2.)	I_{AR}	12	A
Continuous Drain Current	I_D	12	A
Pulsed Drain Current (Note 2.)	I_{DM}	48	A
Single Pulsed Avalanche Energy (Note 3.)	E_{AS}	790	mJ
Repetitive Avalanche Energy (Note 2.)	E_{AR}	24	mJ
Peak Diode Recovery dv/dt (Note 4.)	dv/dt	4.5	V/ns
Power Dissipation	P_D	51	W
Junction Temperature	T_J	150	$^\circ C$
Operating Temperature Range	T_{OPR}	-55 to +150	$^\circ C$
Storage Temperature Range	T_{STG}	-55 to +150	$^\circ C$

Electrical Characteristics(@ $T_A = +25^\circ C$, unless otherwise specified.)

Notes: 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged.

Absolute maximum ratings are stress ratings only and functional device operation is not implied.

2. Repetitive Rating : Pulse width limited by maximum junction temperature

3. $L = 10mH, I_{AS} = 12A, V_{DD} = 50V, R_G = 25\Omega, \text{Starting } T_J = 25^\circ C$

4. $I_{SD} \leq 12A, di/dt \leq 200A/s, V_{DD} \leq BV_{DSS}, \text{Starting } T_J = 25^\circ C$

Electrical Characteristics(@TA = +25°C, unless otherwise specified.)

Parameter	Test Conditions	Symbol	Min	Typ	Max	Unit
OFF Characteristics						
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	BV_{DSS}	650	-	-	V
Gate-Source Leakage Current	$V_{DS}=0V, V_{GS}=30V$	I_{GSS}	-	-	100	nA
Gate-Source Leakage Current	$V_{DS}=0V, V_{GS}=-30V$		-	-	-100	nA
Drain-Source Leakage Current	$V_{DS}=650V, V_{GS}=0V$	I_{DSS}	-	-	1	μA
Breakdown Voltage Temperature Coefficient	$I_D=250\mu A$, Referenced to 25°C	$\Delta BV_{DSS}/\Delta T_J$	-	0.7	-	V/°C
ON Characteristics						
Gate-Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	$V_{th(GS)}$	2	-	4	V
Static Drain-Source On-State Resistance	$V_{GS}=10V, I_D=6A$	$R_{DS(ON)}$	-	0.65	0.85	Ω
Dynamic Characteristics						
Input Capacitance	$V_{DS}=25V, V_{GS}=0V, F=1MHz$	C_{ISS}	-	1480	1900	pF
Output Capacitance		C_{OSS}	-	200	270	
Reverse Transfer Capacitance		C_{RSS}	-	25	35	
Switching Characteristics						
Turn-On Delay Time	$V_{DD}=325V, I_D=12A, R_G=25\Omega$ (Note 1,2)	$t_{D(ON)}$	-	30	70	ns
Turn-On Rise Time		t_R	-	115	240	
Turn-Off Delay Time		$t_{D(OFF)}$	-	95	200	
Turn-Off Fall Time		t_F	-	85	180	
Switching Characteristics						
Total Gate Charge	$V_{DS}=520V, I_D=12A, V_{GS}=10V$ (Note 1,2)	Q_G	-	42	54	nC
Gate-Source Charge		Q_{GS}	-	8.6	-	
Gate-Drain Charge		Q_{GD}	-	21	-	
Drain-Source Diode Characteristics And Maximum Ratings						
Drain-Source Diode Forward Voltage	$I_S=12A, V_{GS}=0V$	V_{SD}	-	-	1.4	V
Maximum Continuous Drain-Source Diode Forward Current		I_S	-	-	12	A
Maximum Pulsed Drain-Source Diode Forward Current		I_{SM}	-	-	48	A
Reverse Recovery Time	$V_{GS}=0V, I_S=12A, di_f/dt=100A/\mu s$ (Note 1)	t_{RR}	-	380	-	ns
Reverse Recovery Charge		Q_{RR}	-	3.5	-	μC

Notes: 1. Pulse Test : Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$
 2. Essentially independent of operating temperature



Rating and Characteristic Curves

FIG.1 - On-Region Characteristics

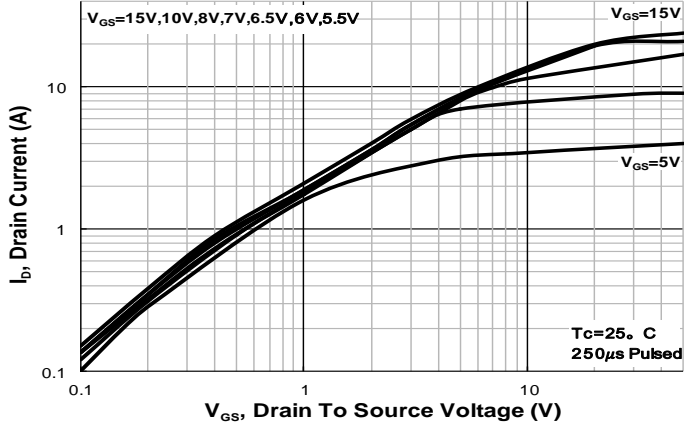


FIG.2 - Transfer Characteristics

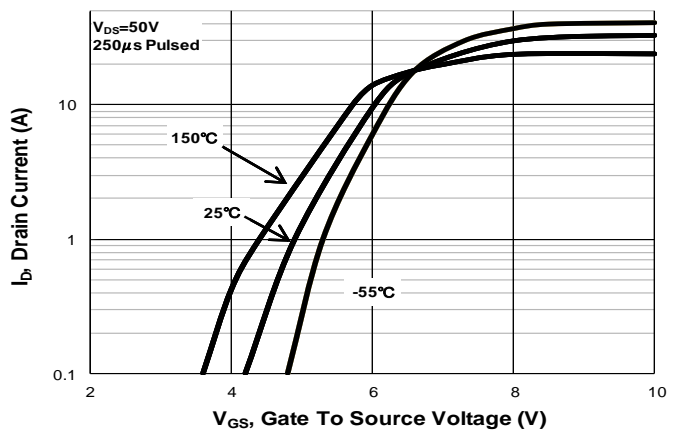


FIG.3 - Drain Source On Resistance

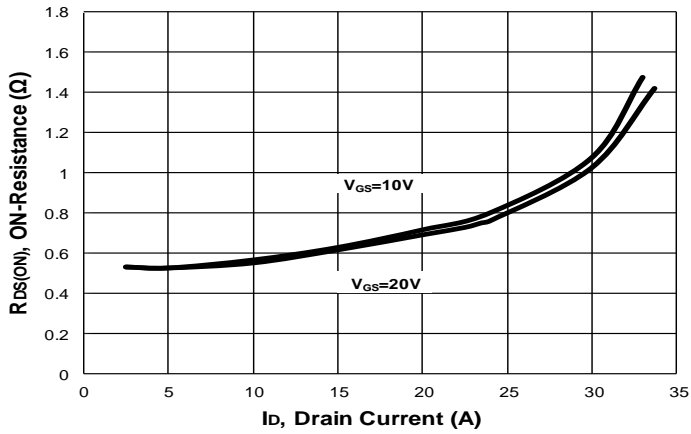


FIG.4 - Body Diode Characteristics

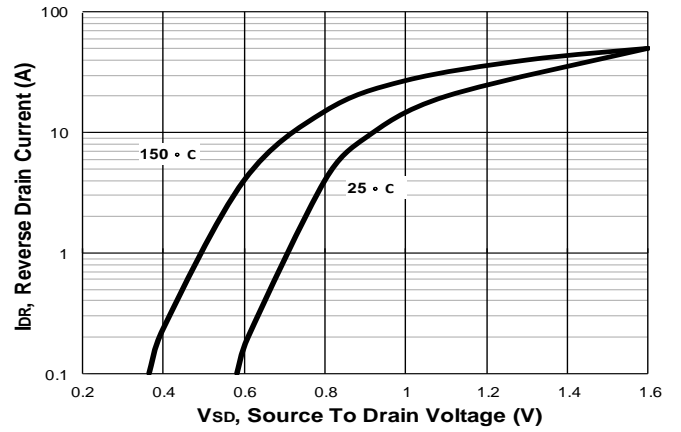


FIG.5 - Capacitance Characteristics

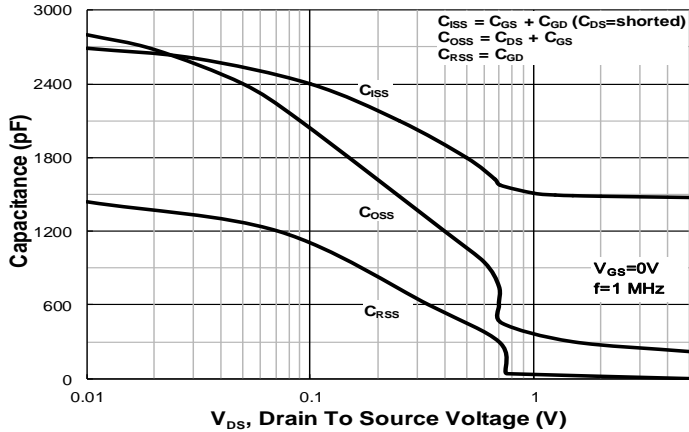
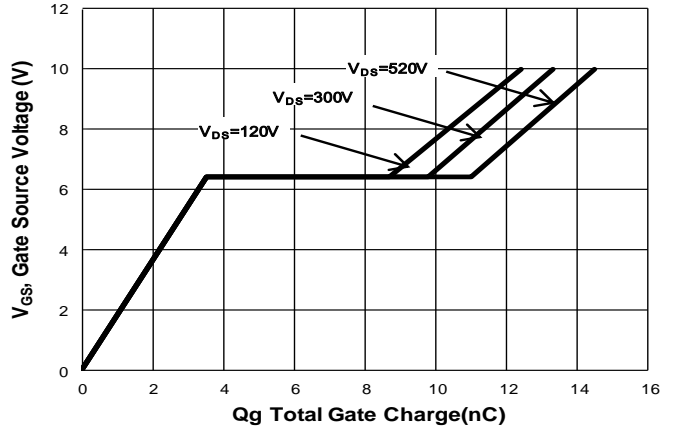


FIG.6 - Gate Charge Characteristics





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