

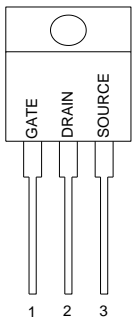


GENERAL DESCRIPTION

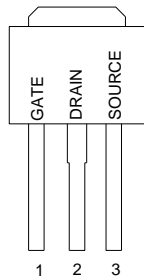
This advanced high voltage MOSFET is designed to withstand high energy in the avalanche mode and switch efficiently. This new high energy device also offers a drain-to-source diode with fast recovery time. Designed for high voltage, high speed switching applications such as power supplies, converters, power motor controls and bridge circuits.

PIN CONFIGURATION

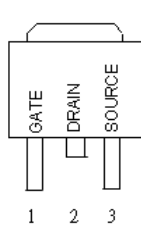
TO-220/TO-220FP
Top View



TO-251
Front View



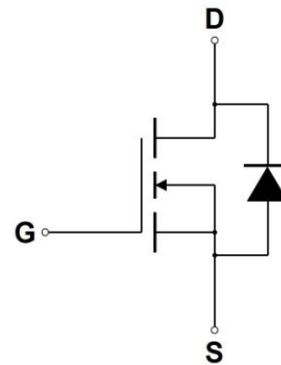
TO-252
Front View



FEATURES

- ◆ SJ MOS
- ◆ Higher Current Rating
- ◆ Lower Rds(on)
- ◆ Lower Capacitances
- ◆ Lower Total Gate Charge

SYMBOL



N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Drain to Current — Continuous	$I_{D(1)}$	7.3	A
— Pulsed	I_{DM}	21.9	A
Gate-to-Source Voltage — Continue	V_{GS}	± 20	V
Total Power Dissipation TO-251/TO-252	P_D	80.6	W
TO-220		83.3	
TO-220FP		27	
Derate above 25°C TO-251/TO-252	P_D	0.65	W/°C
TO-220		0.67	
TO-220FP		0.22	
Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	°C
Single Pulse Drain-to-Source Avalanche Energy — $T_J = 25^\circ\text{C}$ ($V_{DD} = 100\text{V}, V_{GS} = 10\text{V}, I_L = 3.0\text{A}, L = 10\text{mH}, R_G = 25\Omega$)	E_{AS}	113.3	mJ
Thermal Resistance — Junction to Case TO-251/TO-252	θ_{JC}	1.55	°C/W
TO-220		1.5	
TO-220FP		4.6	
— Junction to Ambient TO-251/TO-252/ TO-220/ TO-220FP	θ_{JA}	62.5	
Maximum Lead Temperature for Soldering Purposes, 1/8" from case for 10 seconds	T_L	260	°C

(1) Drain current limited by maximum junction temperature (TO220)



GWM07S60

POWER FIELD EFFECT TRANSISTOR

ORDERING INFORMATION

Part Number	TOP MARK	Part Number	Packing Mthod	Note
GWM07S60XN251 (Note1)	GWM07S60X	TO-251	Tube	
GWM07S60XN252 (Note1)	GWM07S60X	TO-252	Tube	
GWM07S60XN252TR(Note1)	GWM07S60X	TO-252	Tape and Reel	
GWM07S60XN220 (Note1)	GWM07S60X	TO-220	Tube	
GWM07S60XN220FP (Note1)	GWM07S60X	TO-220FP	Tube	

Note1: X : Suffix for Halogen Free and PB Free Product

ELECTRICAL CHARACTERISTICS

Unless otherwise specified, $T_J = 25^\circ\text{C}$.

Characteristic		Symbol	GWM07S60			Units
			Min	Typ	Max	
Drain-Source Breakdown Voltage ($V_{GS} = 0\text{ V}$, $I_D = 1\text{ mA}$)		$V_{(BR)DSS}$	600			V
Drain-Source Leakage Current ($V_{DS} = 600\text{ V}$, $V_{GS} = 0\text{ V}$)		I_{DSS}			1	μA
Gate-Source Leakage Current-Forward ($V_{gsf} = 20\text{ V}$, $V_{DS} = 0\text{ V}$)		I_{GSSF}			100	nA
Gate-Source Leakage Current-Reverse ($V_{gsr} = -20\text{ V}$, $V_{DS} = 0\text{ V}$)		I_{GSSR}			100	nA
Gate Threshold Voltage ($V_{DS} = V_{GS}$, $I_D = 250\ \mu\text{ A}$)		$V_{GS(th)}$	2	3	4	V
Static Drain-Source On-Resistance ($V_{GS} = 10\text{ V}$, $I_D = 2.4\text{ A}$) *		$R_{DS(on)}$			0.62	Ω
Input Capacitance	$(V_{DS} = 100\text{ V}$, $V_{GS} = 0\text{ V}$, $f = 1.0\text{ MHz}$)	C_{iss}		518		pF
Output Capacitance		C_{oss}		24		pF
Reverse Transfer Capacitance		C_{rss}		1		pF
Turn-On Delay Time	$(V_{DD} = 300\text{ V}$, $I_D = 7\text{ A}$, $V_{GS} = 10\text{ V}$, $R_G = 9.1\Omega$) *	$t_{d(on)}$		10.1		ns
Rise Time		t_r		30.3		ns
Turn-Off Delay Time		$t_{d(off)}$		59.1		ns
Fall Time		t_f		37.9		ns
Total Gate Charge	$(V_{DS} = 480\text{ V}$, $I_D = 7\text{ A}$, $V_{GS} = 10\text{ V}$)*	Q_g		16.2		nC
Gate-Source Charge		Q_{gs}		3.3		nC
Gate-Drain Charge		Q_{gd}		7.8		nC
SOURCE-DRAIN DIODE CHARACTERISTICS						
Forward On-Voltage(1)	$(I_S = 7\text{ A}$, $dI_S/dt = 100\text{ A}/\mu\text{s}$)	V_{SD}			1.5	V
Forward Turn-On Time		t_{on}		**		ns
Reverse Recovery Time		t_{rr}		229		ns

* Pulse Test: Pulse Width $\leq 300\ \mu\text{s}$, Duty Cycle $\leq 2\%$

** Negligible, Dominated by circuit inductance



TYPICAL ELECTRICAL CHARACTERISTICS

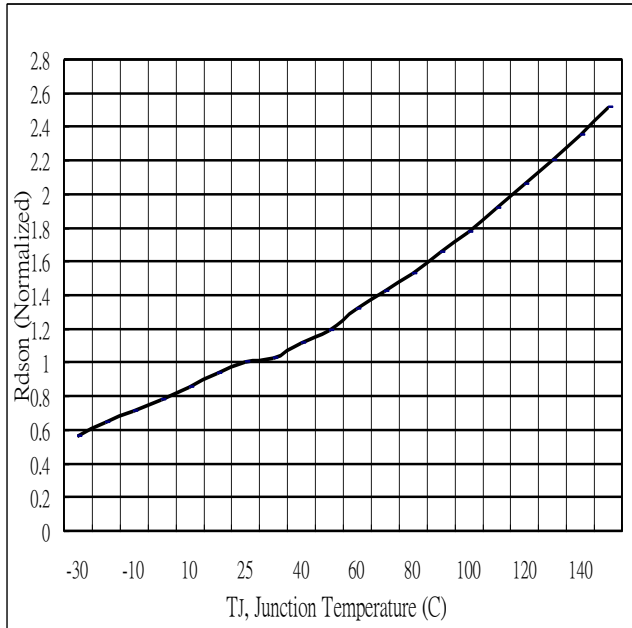


Fig 1. On-Resistance Variation with vs. Temperature

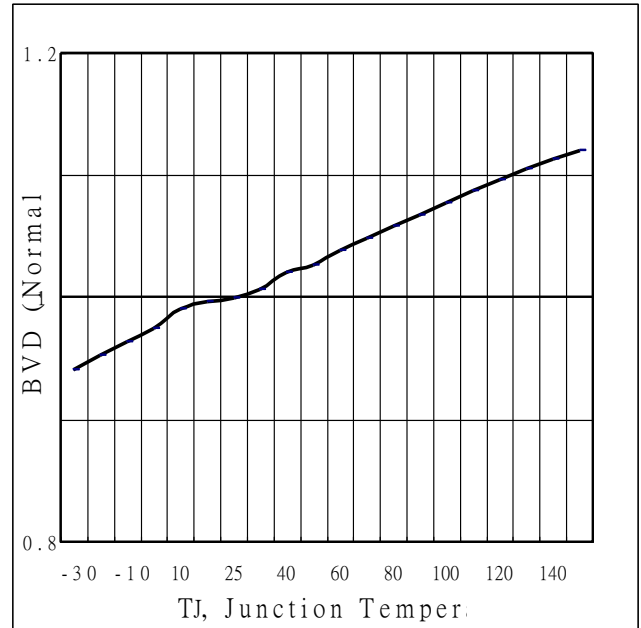


Fig.2 Breakdown Voltage Variation vs. Temperature

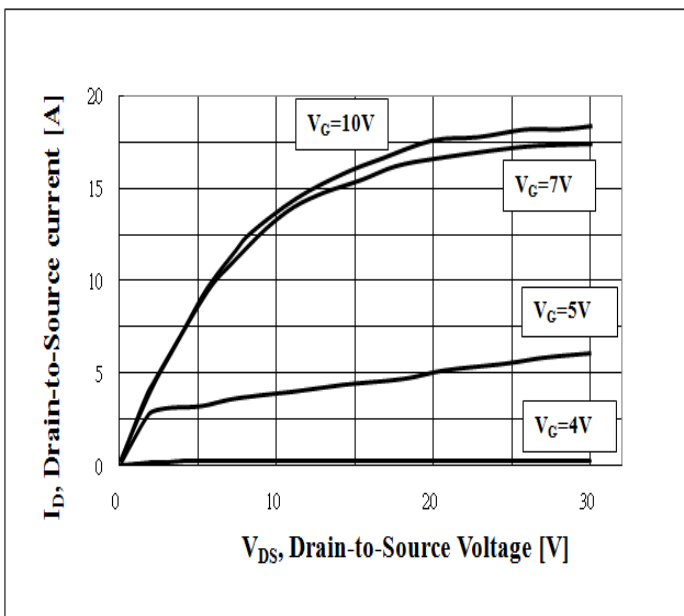


Fig 3. Typical Output Characteristics

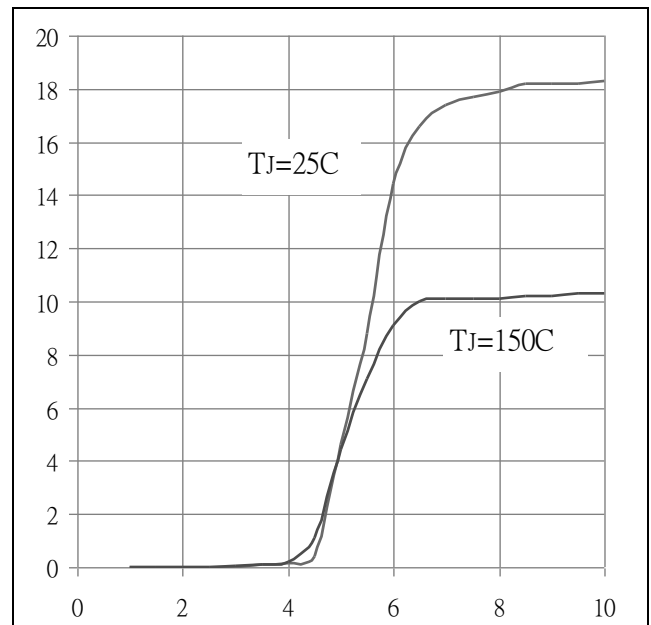


Fig 4. Typical Transfer Characteristics

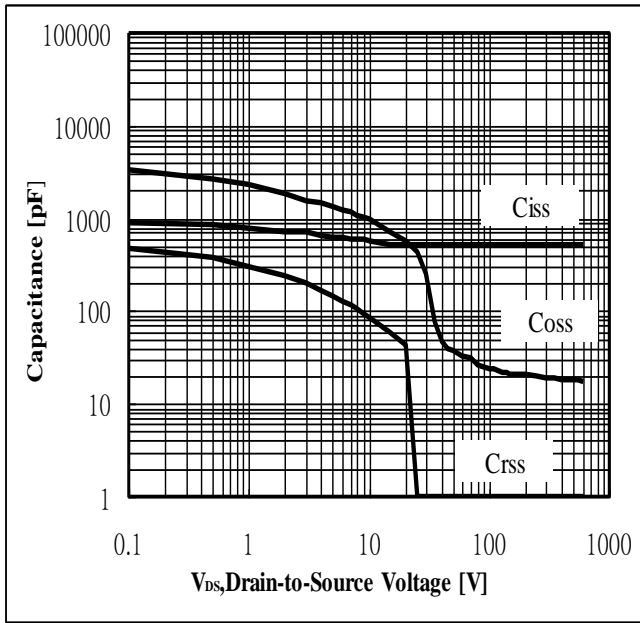


Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

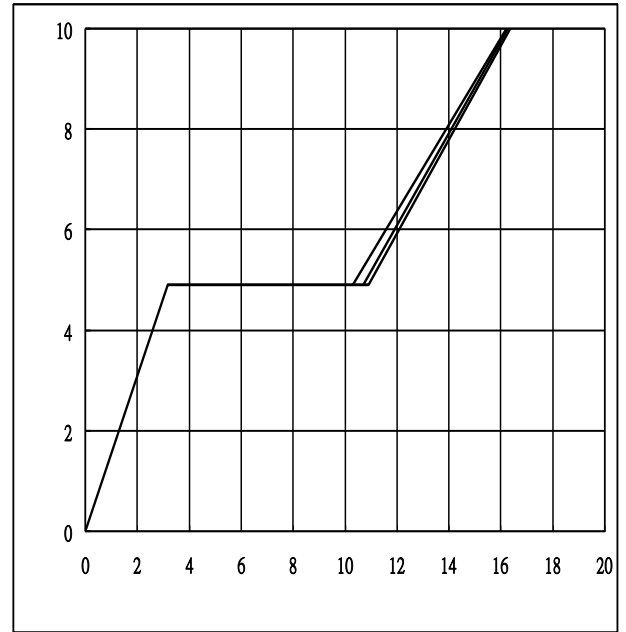


Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage