GWM26S50

POWER FIELD EFFECT TRANSISTOR

GENERAL DESCRIPTION

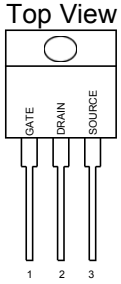
This high voltage MOSFET uses an advanced termination scheme to provide enhanced voltage-blocking capability without degrading performance over time. In addition, this advanced MOSFET is designed to withstand high energy in avalanche and commutation modes. The new energy efficient design also offers a drain-to-source diode with a fast recovery time. Designed for high voltage, high speed switching applications in power supplies, converters and PWM motor controls, these devices are particularly well suited for bridge circuits where diode speed and commutating safe operating areas are critical and offer additional and safety margin against unexpected voltage transients.

FEATURES

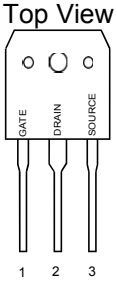
- Robust High Voltage Termination
- Avalanche Energy Specified
- Source-to-Drain Diode Recovery Time Comparable to a Discrete Fast Recovery Diode
- Diode is Characterized for Use in Bridge Circuits
- I_{DSS} and V_{DS}(on) Specified at Elevated Temperature
- Isolated Mounting Hole Reduces Mounting Hardware

PIN CONFIGURATION

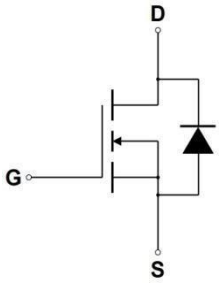
TO-220/TO-220FP
Top View



TO-3P/TO-247
Top View



SYMBOL



N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS

Rating		Symbol	Value	Unit
Drain to Current — Continuous		$I_{D\ 25C(1)}$	26	A
		$I_{D\ 100C(1)}$	16.4	
— Pulsed		I_{DM}	78	
Gate-to-Source Voltage — Continue		V_{GS}	±20	V
Total Power Dissipation	TO-220	P_D	245	W
	TO-220FP		42	
	TO-3P		255	
	TO-247		227	
Derate above 25℃	TO-220		1.96	W/℃
	TO-220FP		0.33	
	TO-3P		2.04	
	TO-247		1.82	
Junction and Storage Temperature Range		T_J, T_{STG}	-55 to 150	℃
Single Pulse Drain-to-Source Avalanche Energy — T_J = 25℃ (V_{DD} = 100V, V_{GS} = 10V, I_L = 8A, L = 10mH, R_G = 25Ω)		E_{AS}	664	mJ
Thermal Resistance — Junction to Case	TO-220	θ_{JC}	0.51	℃/W
	TO-220FP		3	
	TO-3P		0.49	
	TO-247		0.55	
— Junction to Ambient	TO-220, TO-220FP	θ_{JA}	62.5	
	TO-3P ,TO-247		40	
Maximum Lead Temperature for Soldering Purposes, 1/8" from case for 10 seconds		T_L	260	℃

(1) Drain current limited by maximum junction temperature, TO220 Package.

ORDERING INFORMATION

Part Number	TOP MARK	Part Number	Packing Mthod	Note
GWM26S50XN220(Note1)	GWM26S50X	TO-220	Tube	
GWM26S50XN220FP(Note1)	GWM26S50X	TO-220FP	Tube	
GWM26S50XN3P(Note1)	GWM26S50X	TO-3P	Tube	
GWM26S50XN247(Note1)	GWM26S50X	TO-247	Tube	

Note1: X : Suffix for Halogen Free Product.

ELECTRICAL CHARACTERISTICS

Unless otherwise specified, T_J = 25℃

			GWM26S50			
Characteristic		**Symbol**	**Min**	**Typ**	**Max**	**Units**
Drain-Source Breakdown Voltage (V_{GS} = 0V, I_D = 250 μA)		$V_{(BR)DSS}$	500			V
Drain-Source Leakage Current (V_{DS} =500V, V_{GS} = 0V)		I_{DSS}			10	uA
Gate-Source Leakage Current-Forward (V_{gsf} = 20V, V_{DS} = 0V)		I_{GSSF}			100	nA
Gate-Source Leakage Current-Reverse (V_{gsr} = - 20V, V_{DS} = 0V)		I_{GSSR}			100	nA
Gate Threshold Voltage (V_{DS} = V_{GS}, I_D = 250 μA)		$V_{GS(th)}$	2	3	4	V
Static Drain-Source On-Resistance (V_{GS} = 10V, I_D = 8.7A) *		$R_{DS(on)}$			145	mΩ
Gate resistance (f=1MHz, open drain)		R_G		2.5		Ω
Input Capacitance	(V_{DS} = 100V, V_{GS} = 0V, f = 1.0 MHz)	C_{iss}		1261		pF
		C_{oss}		70		pF
Output Capacitance		C_{rss}		30		pF
	(V_{DS} = 400V, V_{GS} = 0V, f = 1.0 MHz)	C_{iss}		1254		pF
Reverse Transfer Capacitance		C_{oss}		37		pF
		C_{rss}		30		pF
Turn-On Delay Time	(V_{DD} = 250V, I_D = 26A, R_G = 25Ω) *	$t_{d(on)}$		17		nS
Rise Time		t_r		75.4		nS
Turn-Off Delay Time		$t_{d(off)}$		61		nS
Fall Time		t_f		60.4		nS
Total Gate Charge	(V_{DS} = 400V, I_D = 26A, V_{GS} = 10V)*	Q_g		39		nC
Gate-Source Charge		Q_{gs}		8.25		nC
Gate-Drain Charge		Q_{gd}		19.3		nC
SOURCE-DRAIN DIODE CHARACTERISTICS						
Forward On-Voltage(1)	(I_S = 26A, dI_S/dt = 100A/μs)	V_{SD}			1.5	V
Forward Turn-On Time		t_{on}		**		ns
Reverse recovery charge		Qrr		1110		nC
Reverse Recovery Time		t_{rr}		146.3		ns

* Pulse Test: Pulse Width ≦300μs, Duty Cycle ≦2%

** Negligible, Dominated by circuit inductance.

TYPICAL ELECTRICAL CHARACTERISTICS

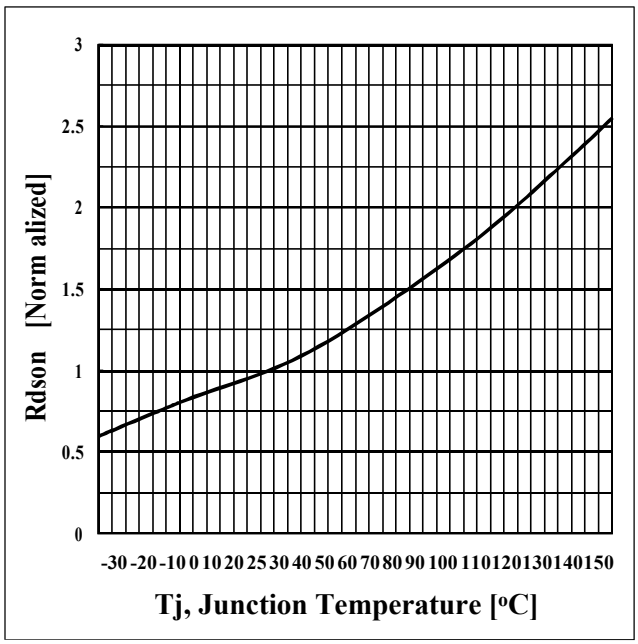


Fig 1. On-Resistance Variation with vs. Temperature

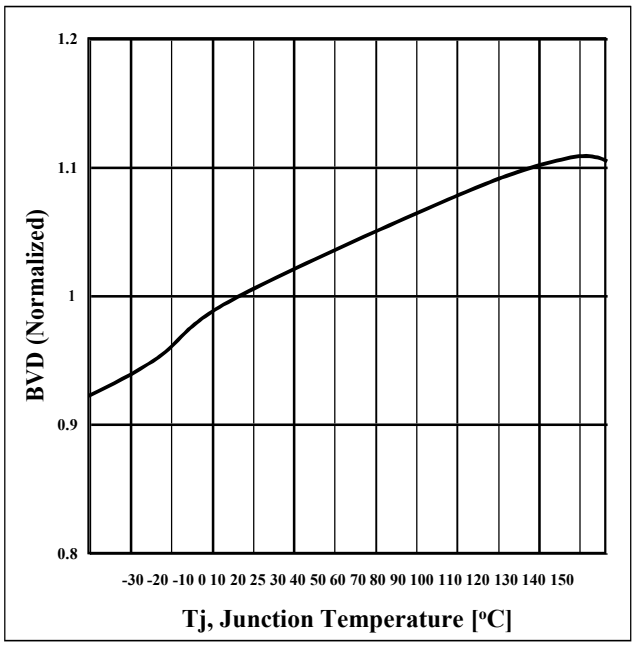


Fig.2 Breakdown Voltage Variation vs. Temperature

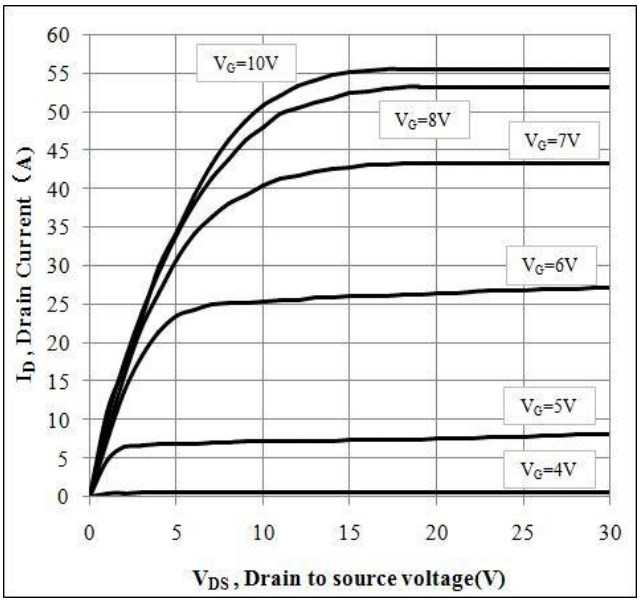


Fig 3. Typical Output Characteristics

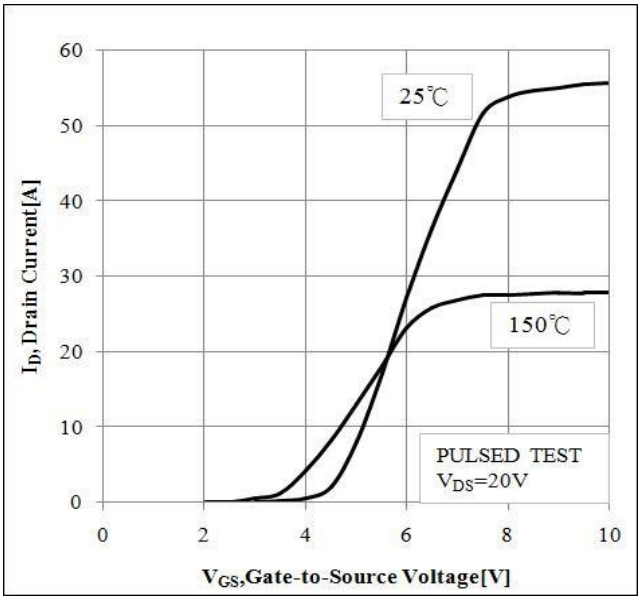


Fig 4. Typical Transfer Characteristics

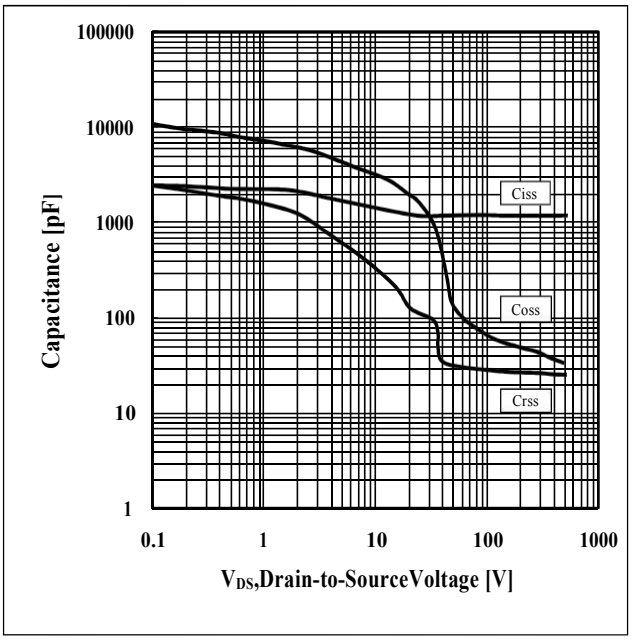


Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

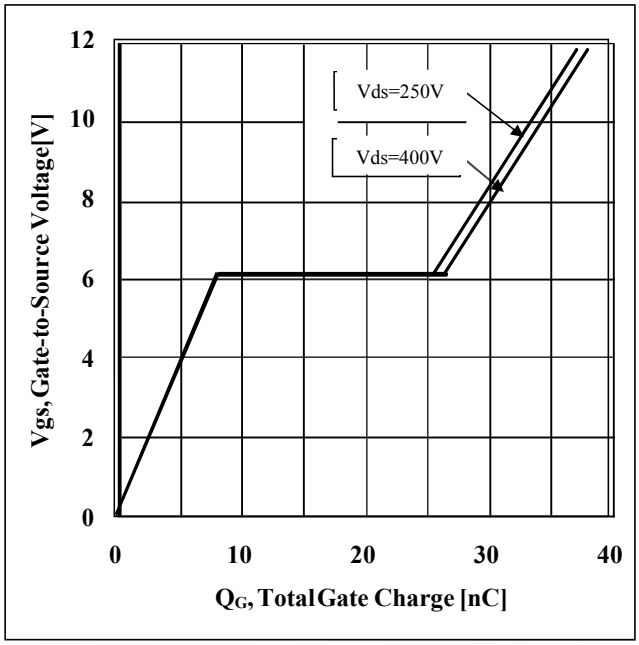


Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage