

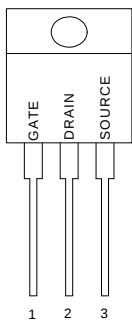


GENERAL DESCRIPTION

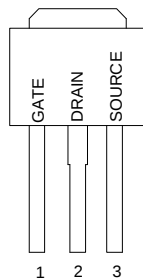
This advanced high voltage MOSFET is designed to withstand high energy in the avalanche mode and switch efficiently. This new high energy device also offers a drain-to-source diode with fast recovery time. Designed for high voltage, high speed switching applications such as power supplies, converters,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

PIN CONFIGURATION

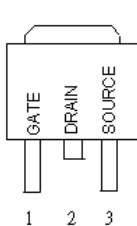
TO-220 / TO-220FP
Front View



TO-251
Front View



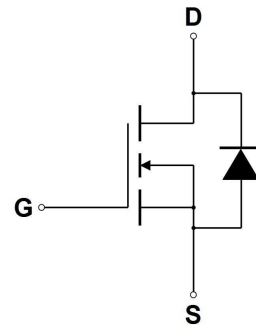
TO-252
Front View



FEATURES

- ◆ SJ MOS
- ◆ Higher Current Rating
- ◆ Lower $R_{ds(on)}$
- ◆ Lower Capacitances
- ◆ Lower Total Gate Charge

SYMBOL



N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Drain to Current — Continuous	$I_{D(1)}$	13.8	A
— Pulsed	I_{DM}	41.4	A
Gate-to-Source Voltage — Continue	V_{GS}	± 20	V
Total Power Dissipation TO-251/TO-252	P_D	100	W
TO-220		167	
TO-220FP		35	
Derate above 25°C TO-251/TO-252		0.8	W/°C
TO-220		1.33	
TO-220FP		0.28	
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}	145	mJ
Thermal Resistance — Junction to Case TO-251/TO-252	θ_{JC}	1.25	°C/W
TO-220		0.75	
TO-220FP		3.6	
— 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)



GWM14S60Y

POWER FIELD EFFECT TRANSISTOR

ORDERING INFORMATION

Part Number	TOP MARK	Part Number	Packing Mthod	Note
GWM14S60YRE	GWM14S60Y	TO-251	Tube	
GWM14S60YRD	GWM14S60Y	TO-252	Tube	
GWM14S60YRDTR	GWM14S60Y	TO-252	Tape and Reel	
GWM14S60YRY	GWM14S60Y	TO-220	Tube	
GWM14S60YRX	GWM14S60Y	TO-220FP	Tube	

Note1: Halogen Free and PB Free Product

ELECTRICAL CHARACTERISTICS

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

		GWM14S60Y			
Characteristic	Symbol	Min	Typ	Max	Units
Drain-Source Breakdown Voltage (V _{GS} = 0 V, I _D = 250 μA)	V _{(BR)DSS}	600			V
Drain-Source Leakage Current (V _{DS} =600 V, V _{GS} = 0 V)	I _{DSS}			1	uA
Gate-Source Leakage Current-Forward (V _{GSF} = 20 V, V _{DS} = 0 V)	I _{GSSF}			100	nA
Gate-Source Leakage Current-Reverse (V _{GSR} = - 20 V, V _{DS} = 0 V)	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} = 10 V, I _D = 4.7A) *		R _{DS(on)}		0.35	Ω
Input Capacitance	(V _{DS} = 100 V, V _{GS} = 0 V, f = 1.0 MHz)	C _{iss}	652		pF
Output Capacitance		C _{oss}	38		pF
Reverse Transfer Capacitance		C _{rss}	1		pF
Turn-On Delay Time	(V _{DD} = 300 V, I _D = 7 A, V _{GS} = 10 V, R _G = 9.1Ω) *	t _{d(on)}	16.6		ns
Rise Time		t _r	38.2		ns
Turn-Off Delay Time		t _{d(off)}	49.9		ns
Fall Time		t _f	38.9		ns
Total Gate Charge	(V _{DS} = 480 V, I _D = 7A, V _{GS} = 10 V)*	Q _g	18.83		nC
Gate-Source Charge		Q _{gs}	3.79		nC
Gate-Drain Charge		Q _{gd}	7.29		nC
SOURCE-DRAIN DIODE CHARACTERISTICS					
Forward On-Voltage(1)	(I _S = 4.7A, d _{IS} /d _t = 100A/μs)	V _{SD}		1.5	V
Forward Turn-On Time		t _{on}	**		ns
Reverse Recovery Time		t _{rr}	203.26		ns

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

** Negligible, Dominated by circuit inductance



TYPICAL ELECTRICAL CHARACTERISTICS

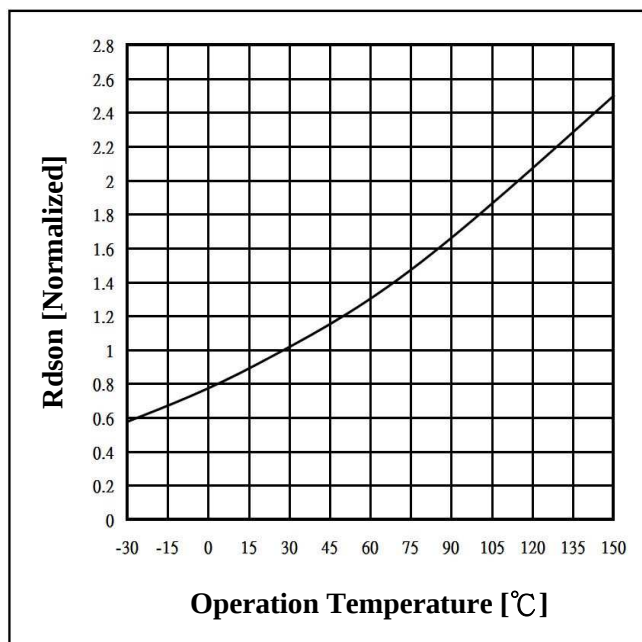


Fig 1. On-Resistance Variation with vs. Temperature

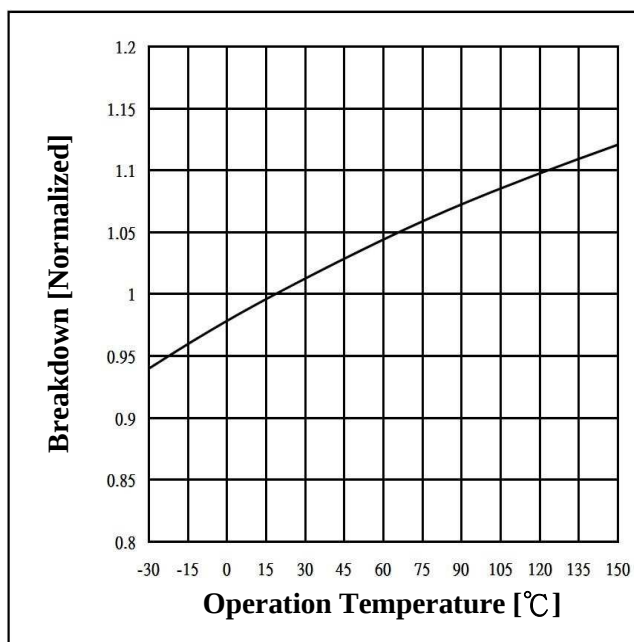


Fig.2 Breakdown Voltage Variation vs. Temperature

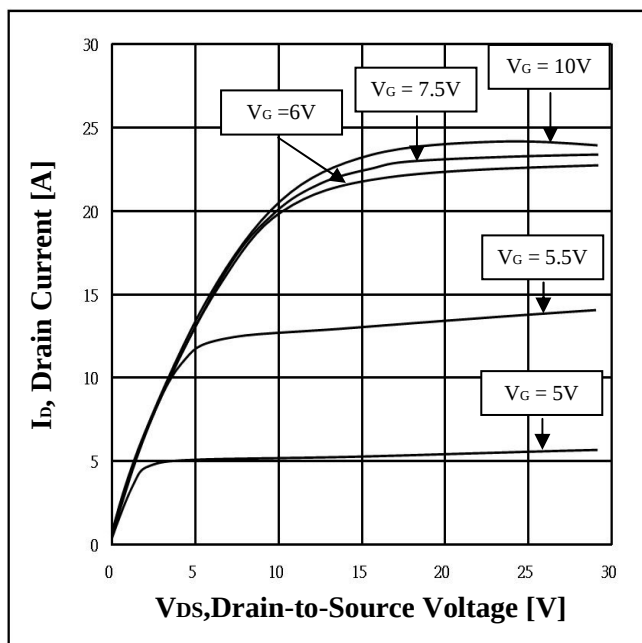


Fig 3. Typical Output Characteristics

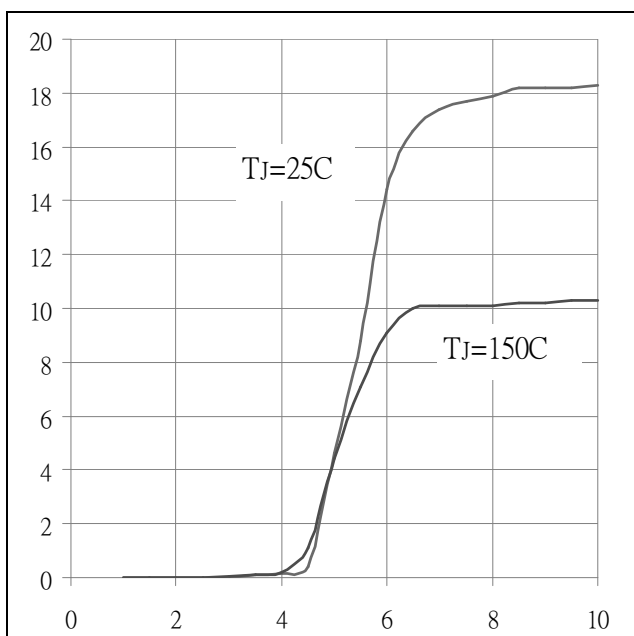


Fig 4. Typical Transfer Characteristics



GWM14S60Y

POWER FIELD EFFECT TRANSISTOR

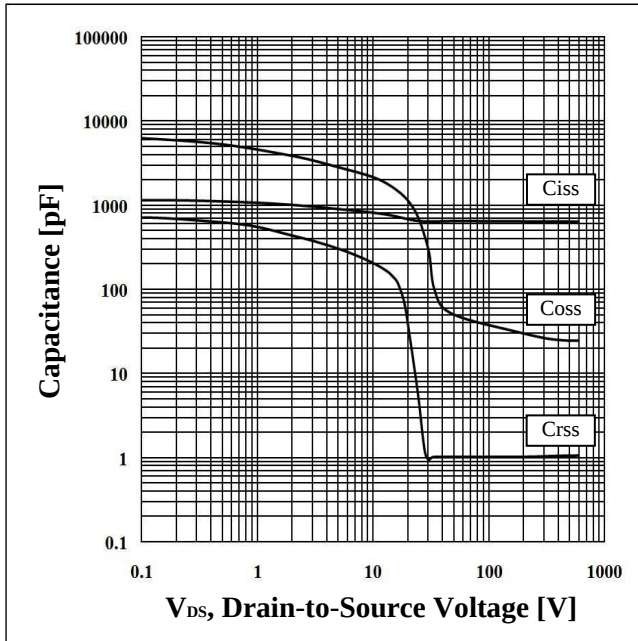


Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

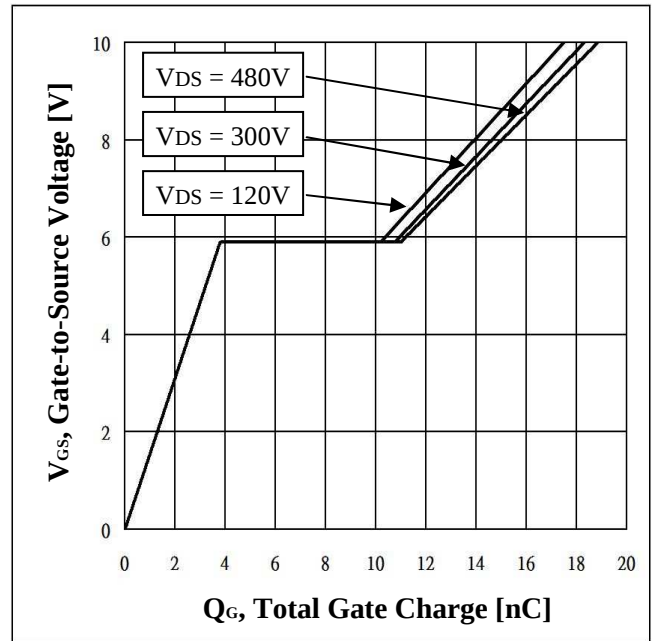


Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage