GPT04N65SX

POWER FIELD EFFECT TRANSISTOR

GENERAL DESCRIPTION

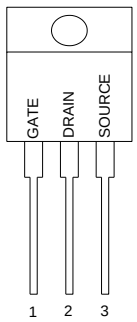
This advanced high voltage MOSFET is designed to withstand high energy in the avalanche mode and switch efficiently. This new high energy device also offers a drain-to-source diode with fast recovery time. Designed for high voltage, high speed switching applications such as power supplies, converters,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

FEATURES

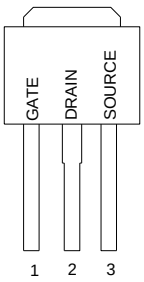
- SJ MOS
- Higher Current Rating
- Lower Rds(on)
- Lower Capacitances
- Lower Total Gate Charge

PIN CONFIGURATION

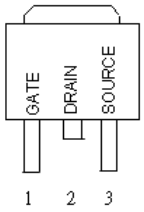
TO-220/TO-220FP Top View



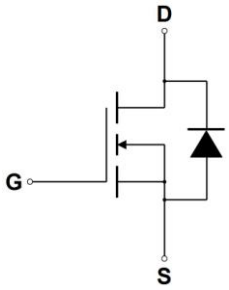
TO-251 Front View



TO-252 Front View



SYMBOL



N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Drain to Current — Continuous	I_D	4.2	A
— Pulsed	I_{DM}	12.6	
Gate-to-Source Voltage — Continue	V_{GS}	±20	V
Total Power Dissipation TO251/TO252	P_D	83.3	W
TO-220		113.6	
TO-220 FP		26.6	
Derate above 25℃ TO251/TO252		0.67	W/℃
TO-220		0.91	
TO-220FP		0.21	
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 = 1.0A, L = 10mH, R_G = 25Ω)	E_{AS}	5	mJ
Thermal Resistance — Junction to Case TO251/TO252	θ_{JC}	1.5	℃/W
TO-220		1.1	
TO-220FP		4.7	
— Junction to Ambient TO251/TO252	θ_{JA}	100	
TO-220/ TO-220FP		62.5	
Maximum Lead Temperature for Soldering Purposes, 1/8" from case for 10 seconds	T_L	260	℃

ORDERING INFORMATION

Part Number	TOP MARK	Part Number	Packing Method	Note
GPT04N65SXN251 (Note1)	GPT04N65SX	TO-251	Tube	
GPT04N65SXN252 (Note1)	GPT04N65SX	TO-252	Tube	
GPT04N65SXN252TR (Note1)	GPT04N65SX	TO-252	Tape and Reel	
GPT04N65SXN220 (Note1)	GPT04N65SX	TO-220	Tube	
GPT04N65SXN220FP (Note1)	GPT04N65SX	TO-220FP	Tube	

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

ELECTRICAL CHARACTERISTICS

Unless otherwise specified, T_J = 25℃.

			GPT04N65S			
Characteristic		**Symbol**	**Min**	**Typ**	**Max**	**Units**
Drain-Source Breakdown Voltage (V_{GS} = 0 V, I_D = 1mA)		$V_{(BR)DSS}$	650			V
Drain-Source Leakage Current (V_{DS} =650 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 μ A)		$V_{GS(th)}$	2.5	3.5	4.5	V
Static Drain-Source On-Resistance (V_{GS} = 10 V, I_D = 0.67 A) *		$R_{DS(on)}$			3.0	Ω
Input Capacitance	(V_{DS} = 100 V, V_{GS} = 0 V, f = 1.0 MHz)	C_{iss}		1044		pF
Output Capacitance		C_{oss}		46		pF
Reverse Transfer Capacitance		C_{rss}		12		pF
Turn-On Delay Time	(V_{DD} = 325 V, I_D = 2 A, V_{GS} = 10 V, R_G = 9.1Ω) *	$t_{d(on)}$		7		ns
Rise Time		t_r		21		ns
Turn-Off Delay Time		$t_{d(off)}$		14		ns
Fall Time		t_f		23.2		ns
Total Gate Charge	(V_{DS} = 520 V, I_D = 2 A, V_{GS} = 10 V)*	Q_g		4.7		nC
Gate-Source Charge		Q_{gs}		2.07		nC
Gate-Drain Charge		Q_{gd}		1.22		nC
SOURCE-DRAIN DIODE CHARACTERISTICS						
Forward On-Voltage(1)	(I_S = 2 A, d_{IS}/d_t = 100A/μs)	V_{SD}			1.5	V
Forward Turn-On Time		t_{on}		**		ns
Reverse Recovery Time		t_{rr}		150.2		ns

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

** Negligible, Dominated by circuit inductance

TYPICAL ELECTRICAL CHARACTERISTICS

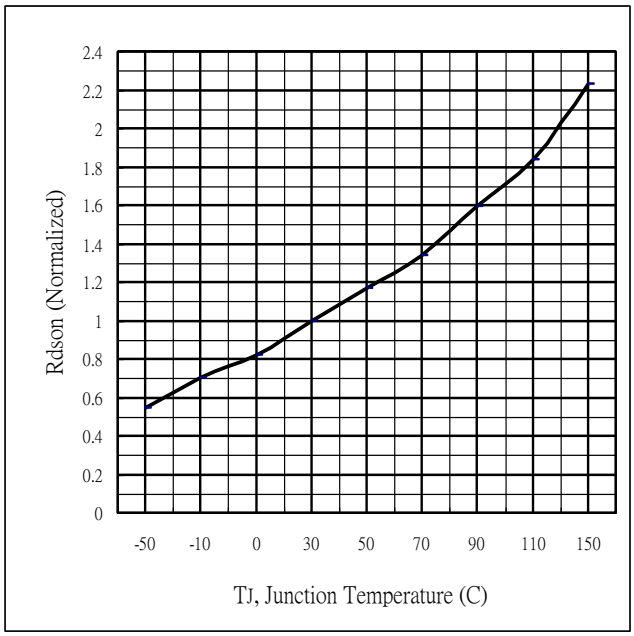


Fig 1. On-Resistance Variation with vs. Temperature

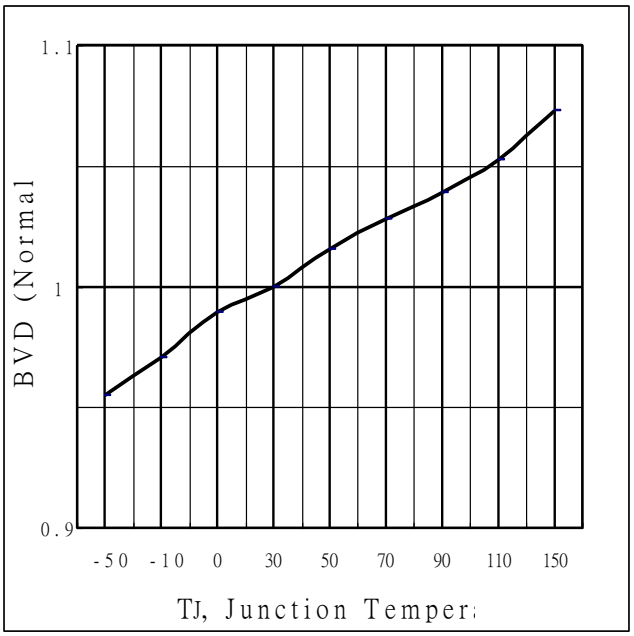


Fig.2 Breakdown Voltage Variation vs. Temperature

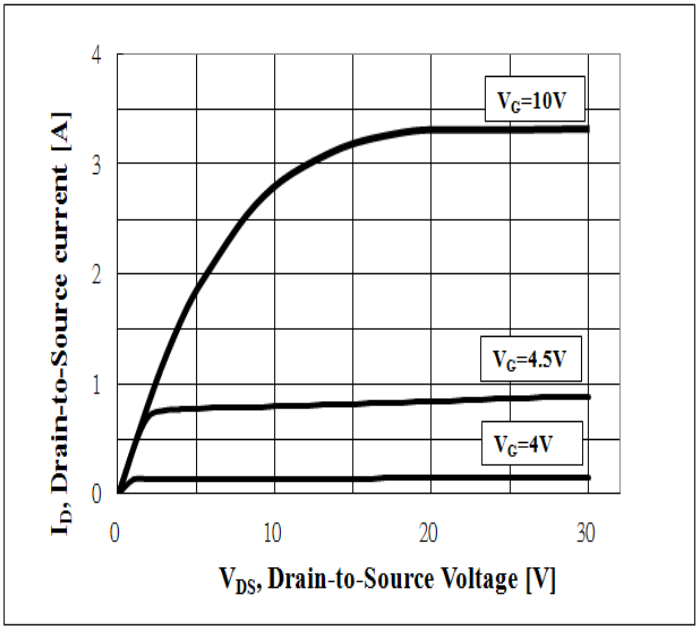


Fig 3. Typical Output Characteristics

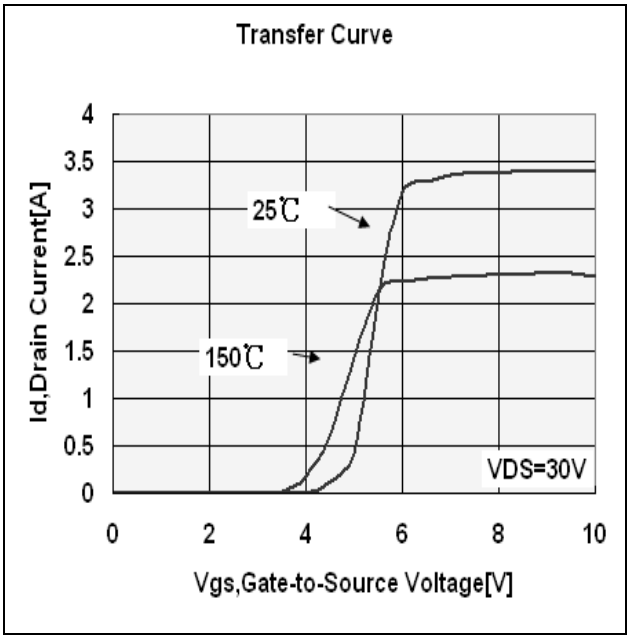


Fig 4. Typical Transfer Characteristics

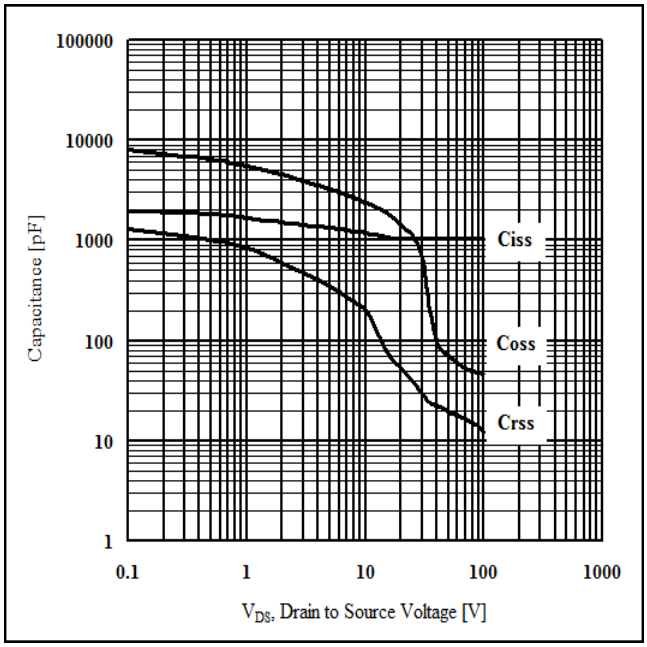


Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

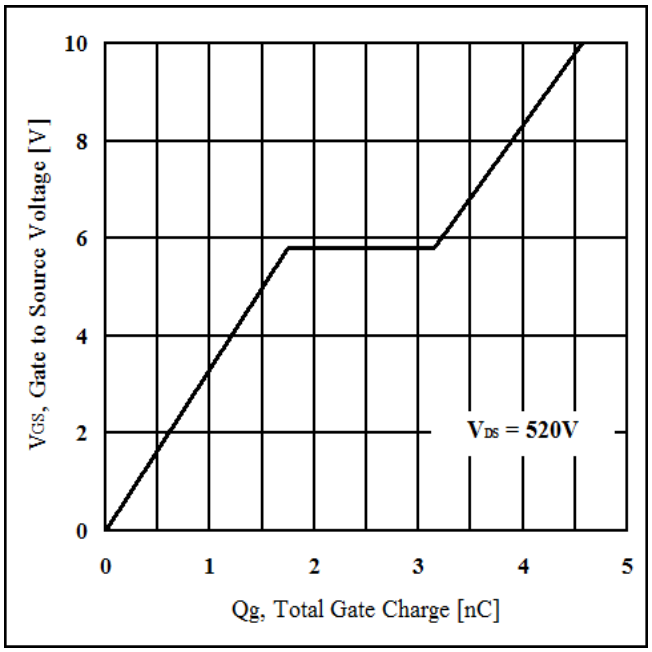


Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage

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