GPT01N65A

POWER FIELD EFFECT TRANSISTOR

GENERAL DESCRIPTION

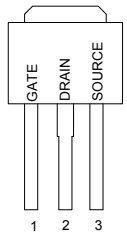
This high voltage MOSFET uses an advanced termination scheme to provide enhanced voltage-blocking capability without degrading performance over time. In addition, this advanced MOSFET is designed to withstand high energy in avalanche and commutation modes. The new energy efficient design also offers 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

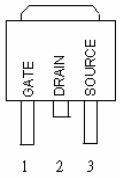
- Robust High Voltage Termination
- Avalanche Energy Specified
- Source-to-Drain Diode Recovery Time Comparable to a Discrete Fast Recovery Diode
- Diode is Characterized for Use in Bridge Circuits
- I_{DSS} and V_{DS}(on) Specified at Elevated Temperature

PIN CONFIGURATION

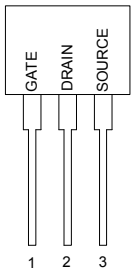
TO-251 Front View



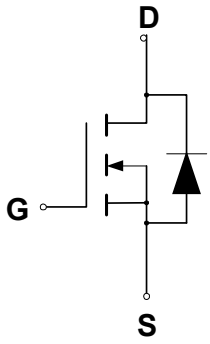
TO-252 Front View



TO-92 Front View



SYMBOL



N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Drain to Current — TO-251(Continuous)	I_D	0.9	A
TO-92 (Continuous)		0.29	
— Pulsed (TO-251)	I_{DM}	2.7	
Gate-to-Source Voltage — Continue	V_{GS}	±30	V
Total Power Dissipation TO-251	P_D	31	W
TO-92		2.9	
Derate above 25℃ TO-251		0.23	W/℃
TO-92		0.02	
Operating 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_{AS} = 0.7A, L = 50mH, R_G = 25Ω)	E_{AS}	2.45	mJ
Thermal Resistance — Junction to Case (TO-251)	θ_{JC}	4.5	℃/W
— Junction to Lead (TO-92)	θ_{JL}	48	
— Junction to Ambient (TO-251)	θ_{JA}	120	
— Junction to Ambient (TO-92)		140	
Maximum Lead Temperature for Soldering Purposes, 1/8" from case for 10 seconds	T_L	260	℃

ORDERING INFORMATION

Part Number	Package
GPT01N65AGN251	TO-251
GPT01N65AGN252	TO-252
GPT01N65AGN92	TO-92

***Note:** G : Suffix for Pb Free Product

ELECTRICAL CHARACTERISTICS

Unless otherwise specified, T_J = 25℃.

			GPT01N65A			
Characteristic		**Symbol**	**Min**	**Typ**	**Max**	**Units**
Drain-Source Breakdown Voltage (V_{GS} = 0 V, I_D = 250 μA)		$V_{(BR)DSS}$	650			V
Drain-Source Leakage Current (V_{DS} = 650 V, V_{GS} = 0 V, TO-92) (V_{DS} = 650 V, V_{GS} = 0 V, TO-251)		I_{DSS}			50 1	uA
Gate-Source Leakage Current-Forward (V_{gsf} = 30 V, V_{DS} = 0 V)		I_{GSSF}			100	nA
Gate-Source Leakage Current-Reverse (V_{gsr} =- 30 V, V_{DS} = 0 V)		I_{GSSR}			100	nA
Gate Threshold Voltage (V_{DS} = V_{GS}, I_D = 250 μA)		$V_{GS(th)}$	2.5	3.5	4.5	V
Static Drain-Source On-Resistance (V_{GS} = 10 V, I_D = 0.5A) * TO-251 TO-92		$R_{DS(on)}$			13	Ω
Forward Transconductance (V_{DS} ≧ 50 V, I_D = 0.5A) *		g_{FS}		1.3		S
Input Capacitance	(V_{DS} = 25 V, V_{GS} = 0 V, f = 1.0 MHz)	C_{iss}		161.1		pF
Output Capacitance		C_{oss}		14.1		pF
Reverse Transfer Capacitance		C_{rss}		1.03		pF
Turn-On Delay Time	(V_{DD} = 325 V, I_D = 0.5 A, R_G = 25Ω) *	$t_{d(on)}$		11.3		ns
Rise Time		t_r		30.1		ns
Turn-Off Delay Time		$t_{d(off)}$		34.1		ns
Fall Time		t_f		65.1		ns
Total Gate Charge	(V_{DS} = 520 V, I_D = 0.5 A, V_{GS} = 10 V)*	Q_g		6.15		nC
Gate-Source Charge		Q_{gs}		1.12		nC
Gate-Drain Charge		Q_{gd}		3.67		nC
SOURCE-DRAIN DIODE CHARACTERISTICS						
Forward On-Voltage(1)	(I_S = 0.5 A, V_{GS} = 0 V, d_{IS}/d_t = 100A/μs)	V_{SD}			1.4	V
Forward Turn-On Time		t_{on}		**		ns
Reverse Recovery Time		t_{rr}		180		ns

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

** Negligible, Dominated by circuit inductance

TYPICAL ELECTRICAL CHARACTERISTICS

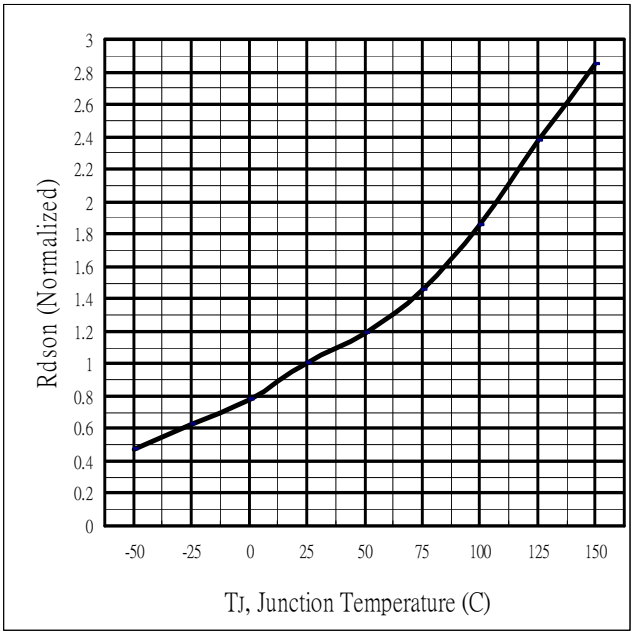


Fig 1. On-Resistance Variation with vs. Temperature

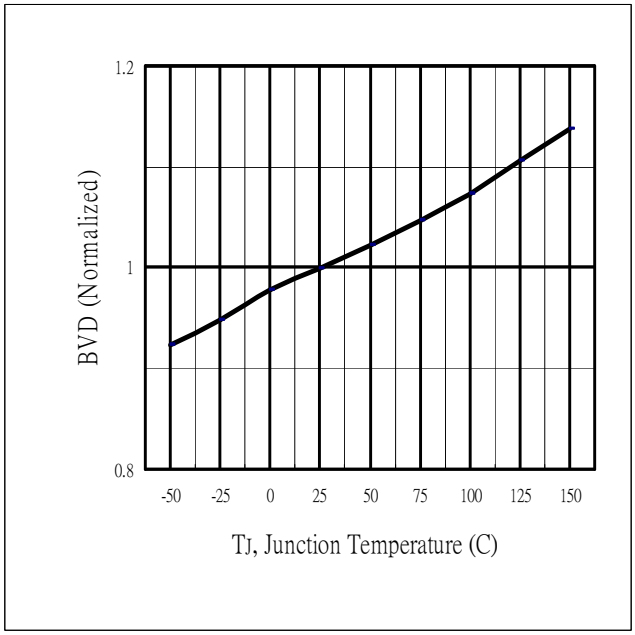


Fig.2 Breakdown Voltage Variation vs. Temperature

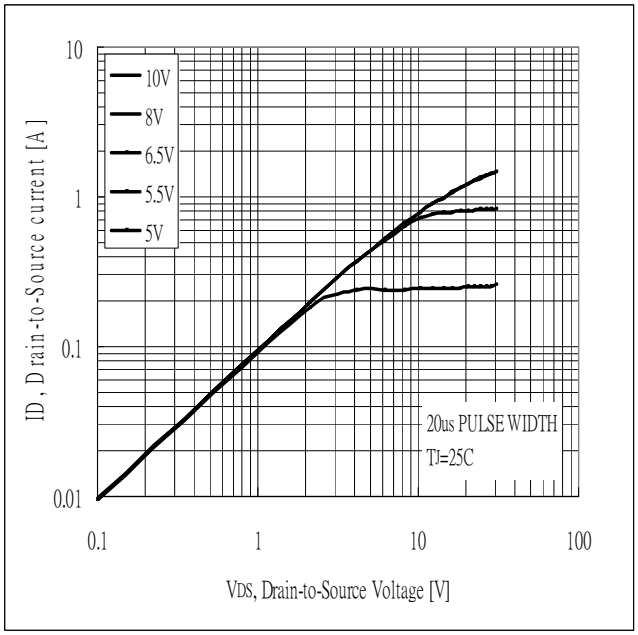


Fig 3. Typical Output Characteristics

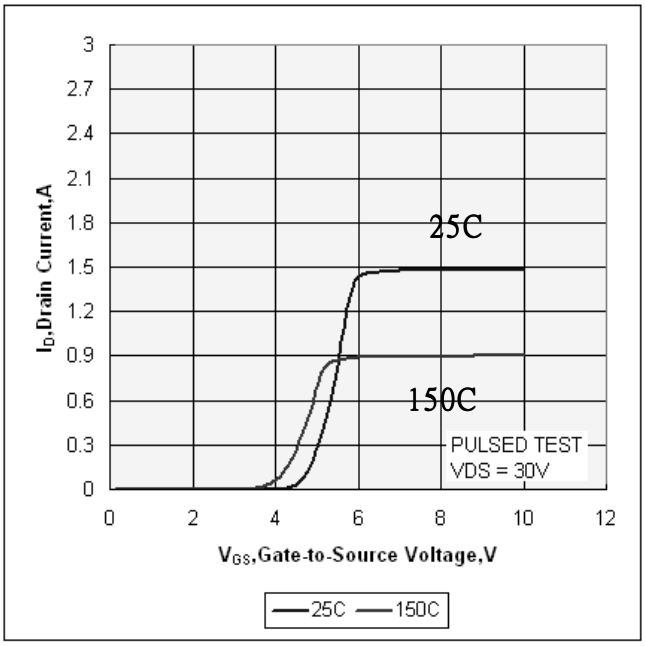


Fig 4. Typical Transfer Characteristics

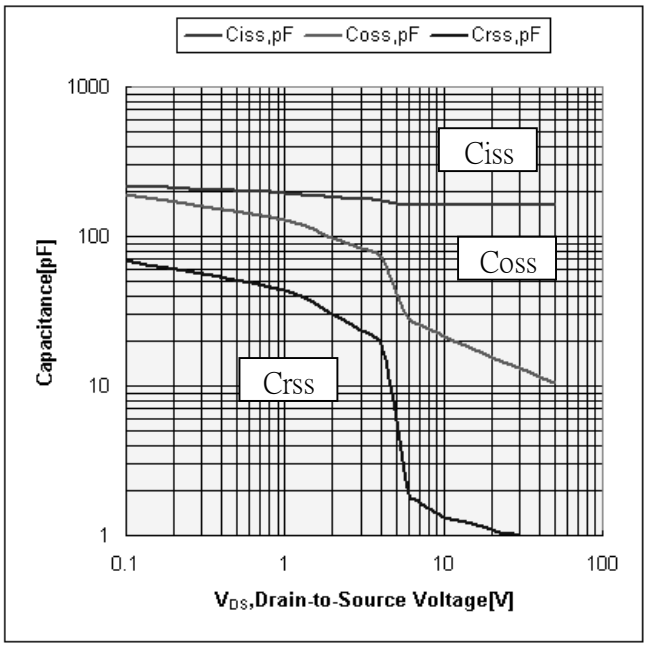


Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

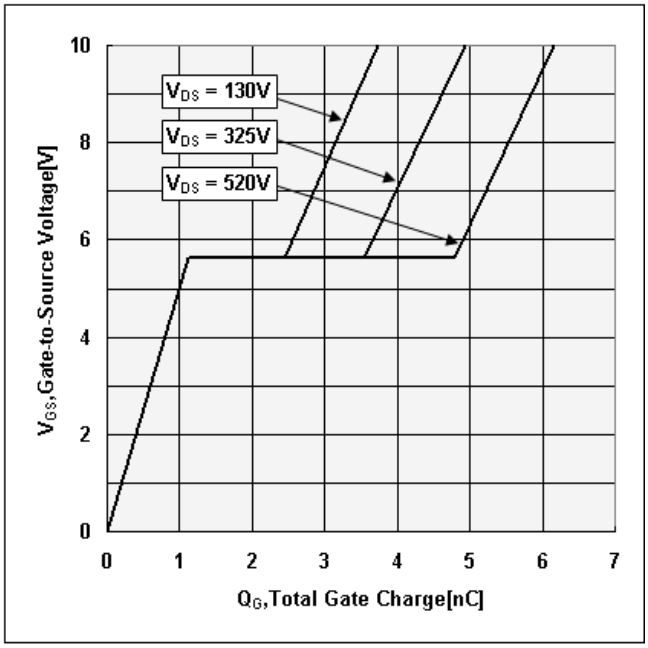
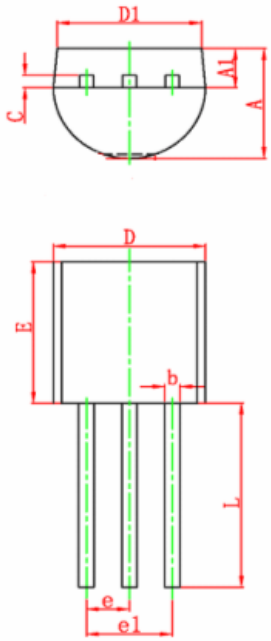


Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage

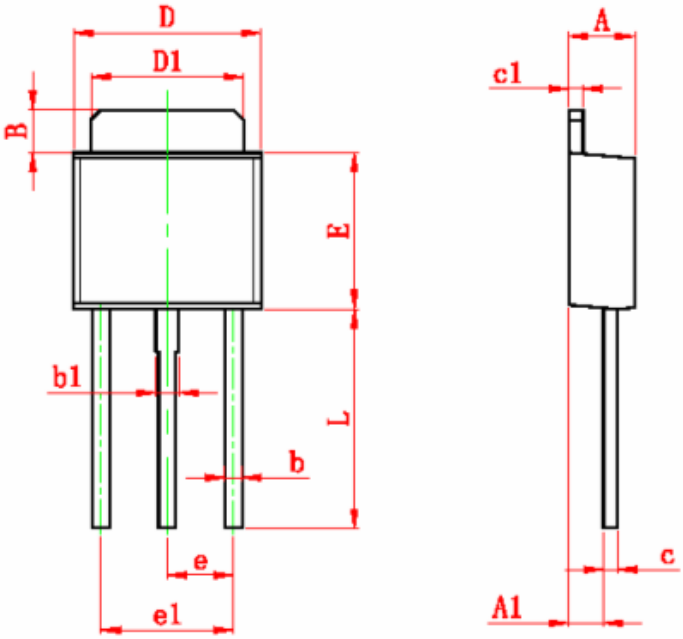
PACKAGE DIMENSION

TO-92



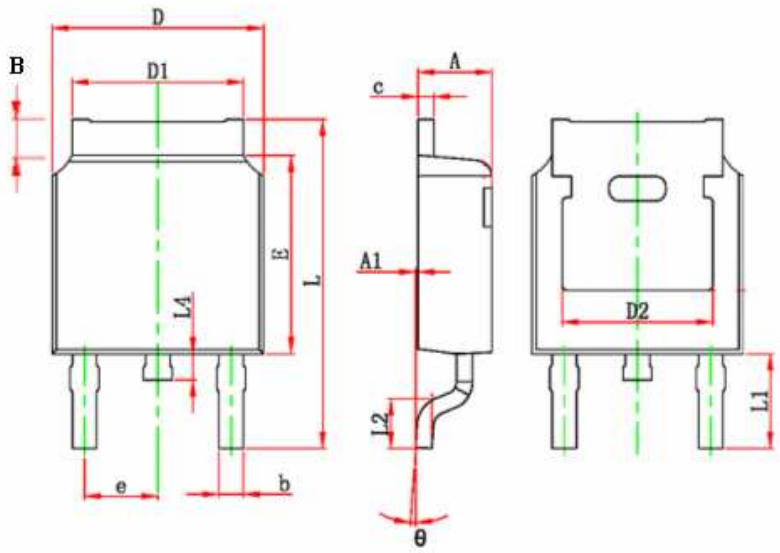
Symbol	Dimensions In Millimeters	
	Min.	Max
A	3.25	3.85
A1	1.00	1.50
b	0.38	0.58
c	0.30	0.52
D	4.30	4.90
D1	4.00 TYP.	
E	4.20	4.80
e	1.27 TYP.	
e1	2.40	2.70
L	13.00	15.00

TO251



Symbol	Dimensions In Millimeters	
	Min.	Max
A	2.10	2.50
A1	0.90	1.35
B	0.90	1.65
b	0.45	0.75
b1	0.65	0.95
c	0.40	0.60
c1	0.40	0.60
D	6.30	6.80
D1	5.00	5.50
E	5.40	6.30
e	2.3 TYP.	
e1	4.40	4.80
L	7.40	8.00

TO-252



Symbol	Dimensions In Millimeters	
	Min.	Max
A	2.10	2.50
A1	0.90	1.35
B	0.90	1.65
b	0.45	0.90
c	0.40	0.60
D	6.30	6.80
D1	5.00	5.50
D2	4.83 TYP.	
E	5.90	6.30
e	2.3 TYP.	
L	9.30	10.50
L2	1.20	1.80
L4	0.60	1.00
θ	0.00	10.00

IMPORTANT NOTICE

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