GPT10N45 GPT10N45D

POWER FIELD EFFECT TRANSISTOR

GENERAL DESCRIPTION

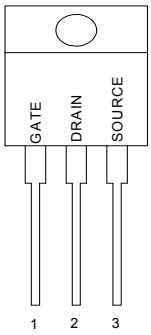
This high voltage MOSFET uses an advanced termination scheme to provide enhanced voltage-blocking capability without degrading performance over time. In addition, this advanced MOSFET is designed to withstand high energy in avalanche and commutation modes. The new energy efficient design also offers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

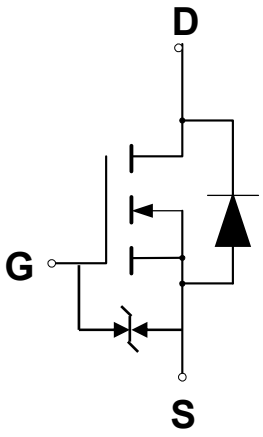
- Robust High Voltage Termination
- Avalanche Energy Specified
- Source-to-Drain Diode Recovery Time Comparable to a Discrete Fast Recovery Diode
- Diode is Characterized for Use in Bridge Circuits
- I_{DSS} and V_{DS}(on) Specified at Elevated Temperature

PIN CONFIGURATION

TO-220F
Top View



SYMBOL



N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Drain to Current — Continuous	I_D	9.6	A
— Pulsed	I_{DM}	28.8	
Gate-to-Source Voltage — Continue	V_{GS}	±30	V
Total Power Dissipation TO220	P_D	138	W
TO220F		40	W/℃
Derate above 25℃ TO220		1	
TO220F		0.32	
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_L = 8A, L = 6mH, R_G = 25Ω)	E_{AS}	320	mJ
Thermal Resistance — Junction to Case TO220	θ_{JC}	0.9	℃/W
TO220F		4.2	
— Junction to Ambient TO220, TO220F	θ_{JA}	62.5	
Maximum Lead Temperature for Soldering Purposes, 1/8" from case for 10 seconds	T_L	260	℃
ESD SENSITIVITY — HBM, C=100pF, R=1.5kΩ	Vesd	2000	V

ORDERING INFORMATION

Part Number	Package
GPT10N45DGN220F*	TO-220F
GPT10N45GN220*	TO-220

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

ELECTRICAL CHARACTERISTICS

Unless otherwise specified, T_J = 25℃.

			GPT10N45			
Characteristic		**Symbol**	**Min**	**Typ**	**Max**	**Units**
Drain-Source Breakdown Voltage (V_{GS} = 0 V, I_D = 250 μA)		$V_{(BR)DSS}$	450			V
Drain-Source Leakage Current (V_{DS} = 450 V, V_{GS} = 0 V)		I_{DSS}			1	μA
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		4.5	V
Static Drain-Source On-Resistance (V_{GS} = 10 V, I_D = 5A) *		$R_{DS(on)}$			0.6	Ω
Forward Transconductance (V_{DS} = 50 V, I_D = 5A) *		g_{FS}		7.5		S
Input Capacitance	(V_{DS} = 25 V, V_{GS} = 0 V, f = 1.0 MHz)	C_{iss}		1284		pF
Output Capacitance		C_{oss}		143		pF
Reverse Transfer Capacitance		C_{rss}		7.61		pF
Turn-On Delay Time	(V_{DD} = 225 V, I_D = 10 A, R_D = 17Ω, R_G = 6.2Ω) *	$t_{d(on)}$		22.1		ns
Rise Time		t_r		22		ns
Turn-Off Delay Time		$t_{d(off)}$		42.4		Ns
Fall Time		t_f		17.9		Ns
Total Gate Charge	(V_{DS} = 360 V, I_D = 10 A, V_{GS} = 10 V)*	Q_g		26.5		nC
Gate-Source Charge		Q_{gs}		7.15		nC
Gate-Drain Charge		Q_{gd}		10.1		nC
SOURCE-DRAIN DIODE CHARACTERISTICS						
Forward On-Voltage(1)	(I_S =5 A, V_{GS} = 0 V, d_{IS}/d_t = 100A/μs)	V_{SD}			1.5	V
Forward Turn-On Time		t_{on}		**		ns
Reverse Recovery Time		t_{rr}		354		ns

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

** Negligible, Dominated by circuit inductance

TYPICAL ELECTRICAL CHARACTERISTICS

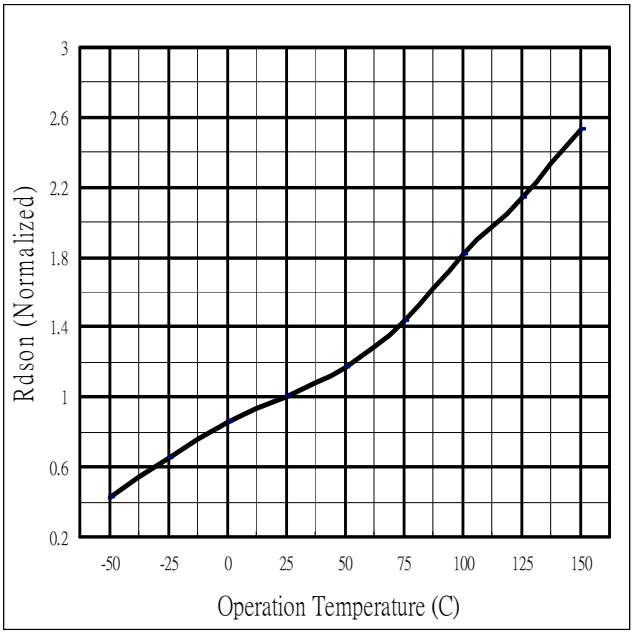


Fig 1. On-Resistance Variation with vs. Temperature

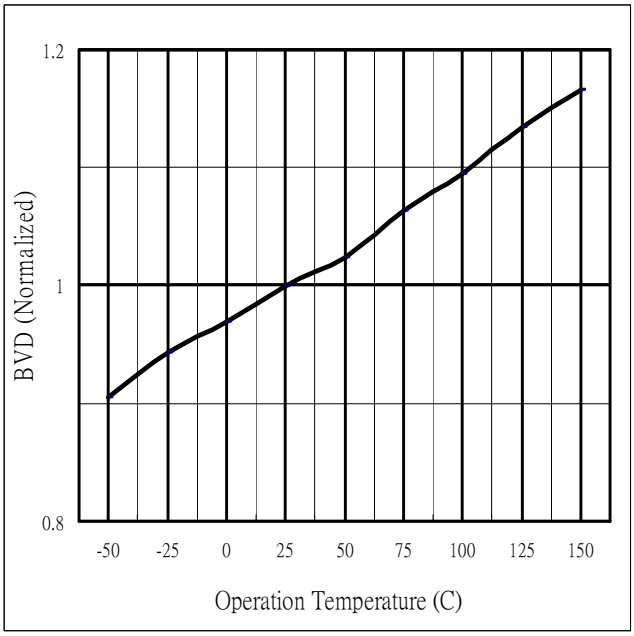


Fig.2 Breakdown Voltage Variation vs. Temperature

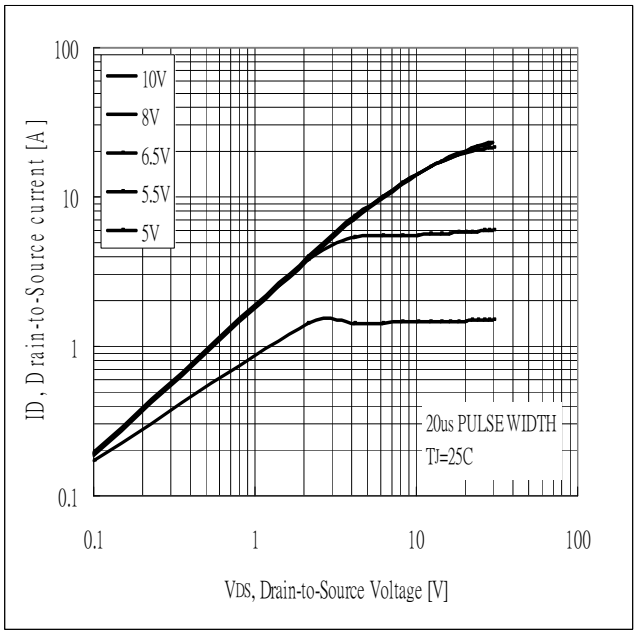


Fig 3. Typical Output Characteristics

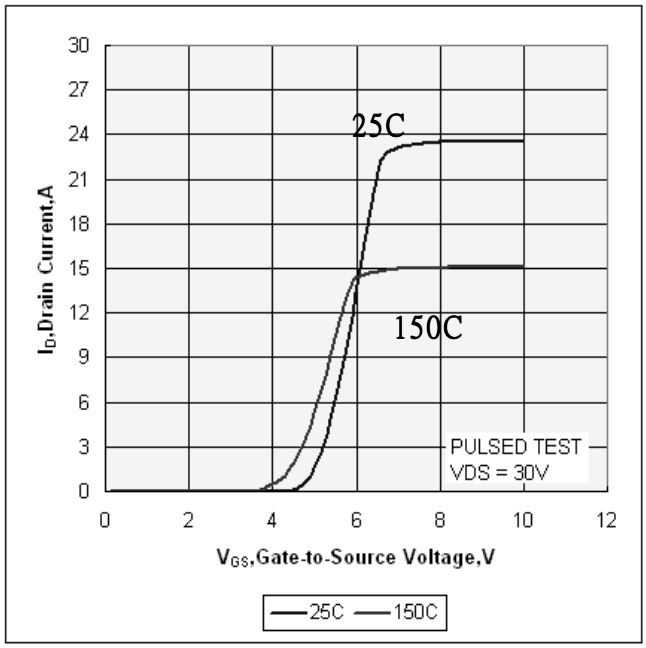


Fig 4. Typical Transfer Characteristics

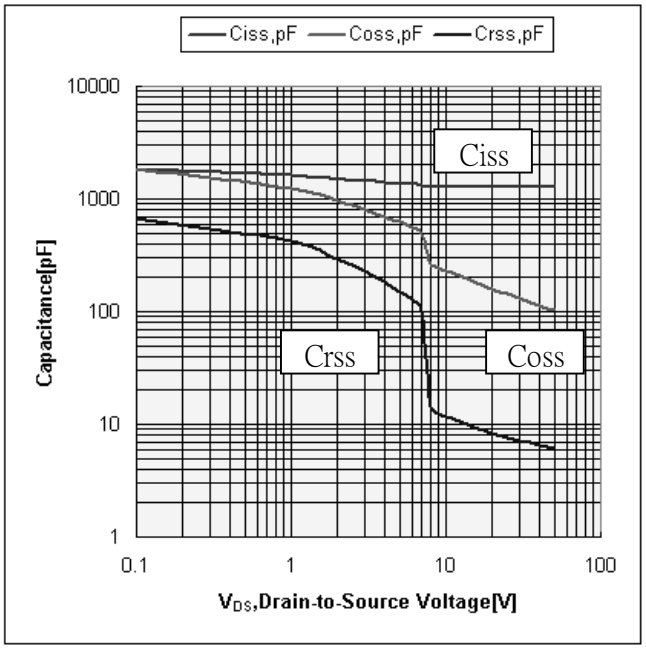


Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

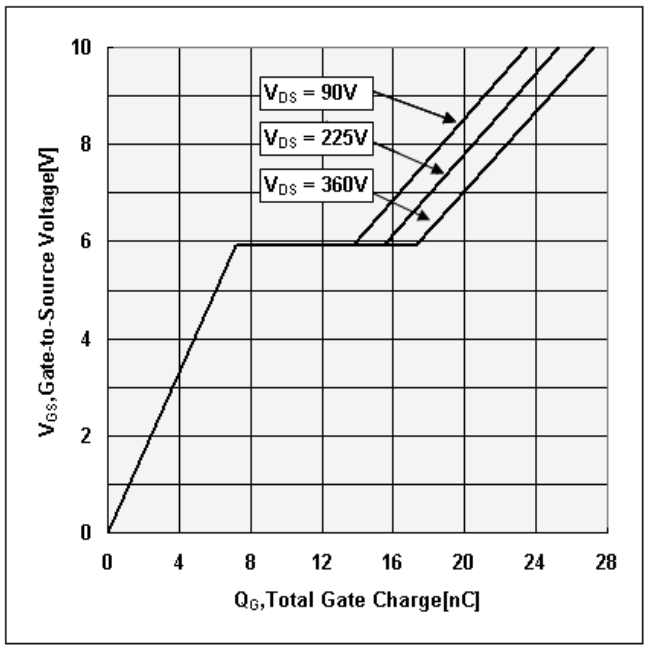
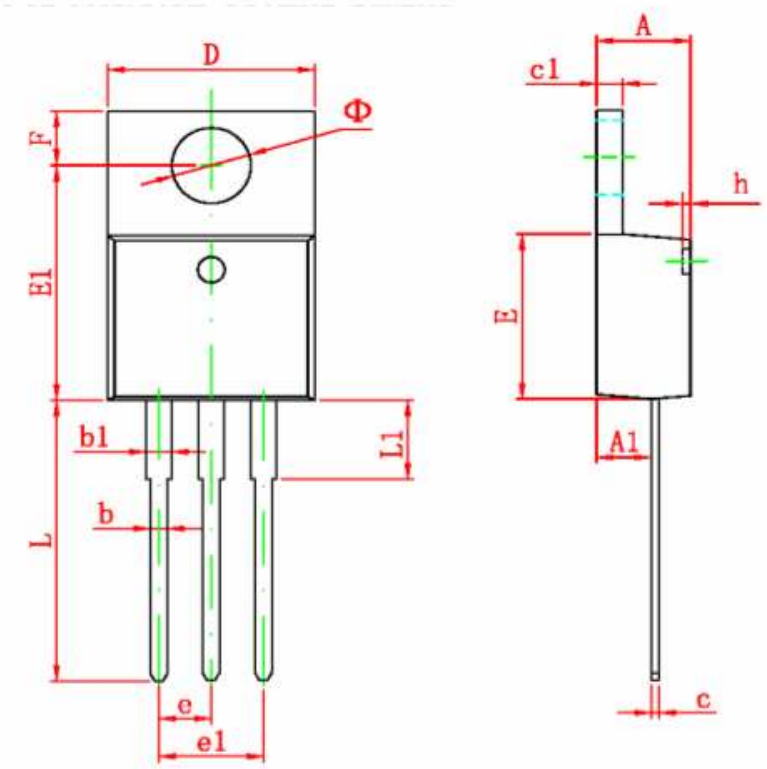


Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage

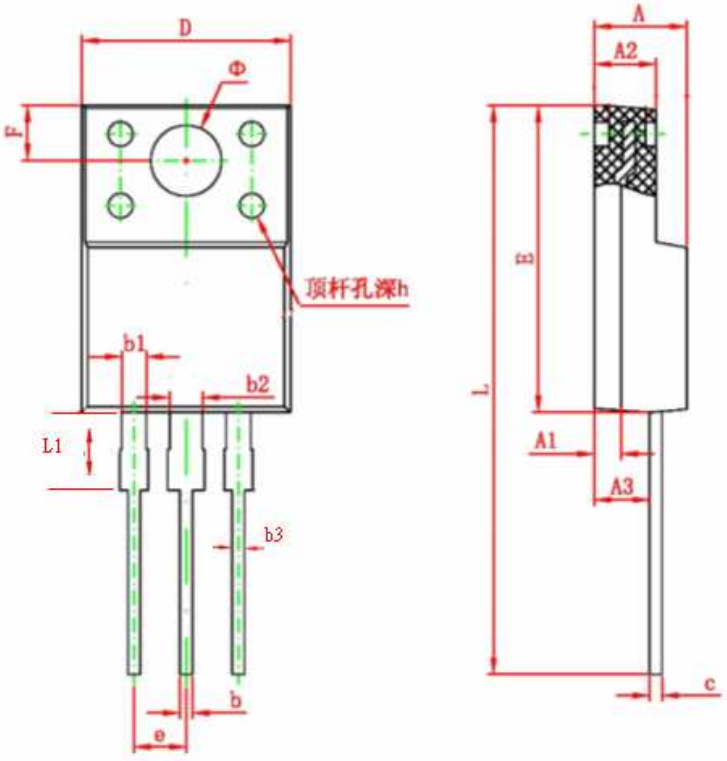
PACKAGE DIMENSION

TO-220



Symbol	Dimensions In Millimeters	
	Min.	Max
A	4.40	4.80
A1	2.10	2.84
b	0.71	0.91
b1	1.17	1.37
c	0.30	0.60
c1	1.17	1.47
D	9.40	10.60
E	8.40	9.60
e	2.54 TYP.	
e1	4.90	5.60
F	3.00 REF.	
Φ	3.50 REF.	
h	0.00	0.30
L	12.50	14.00
L1	3.50	4.00

TO-220F



Symbol	Dimensions In Millimeters	
	Min.	Max
A	3.80	4.70
A1	1.3 REF.	
A2	2.20	3.20
A3	2.10	3.20
b	0.30	0.95
b1	1.00	1.75
b2	1.00	1.75
b3	0.50	0.80
c	0.30	0.90
D	9.90	10.40
E	14.60	16.20
e	2.54 TYP.	
F	3.00 REF.	
Φ	3.50 REF.	
h	0.00	0.30
L	28.00	30.00
L1	3.20	3.55

IMPORTANT NOTICE

Great Power Microelectronic Corporation (GP) reserves the right to make changes to its products or to discontinue any integrated circuit product or service without notice, and advises its customers to obtain the latest version of relevant information to verify, before placing orders, that the information being relied on is current.

A few applications using integrated circuit products may involve potential risks of death, personal injury, or severe property or environmental damage. GP integrated circuit products are not designed, intended, authorized, or warranted to be suitable for use in life-support applications, devices or systems or other critical applications. Use of GP products in such applications is understood to be fully at the risk of the customer. In order to minimize risks associated with the customer's applications, the customer should provide adequate design and operating safeguards.

虹冠電子工業股份有限公司
Champion Microelectronic Corporation
Web:http://www.champion-micro.com/

深圳市冠顺微电子股份有限公司
Shenzhen Great Power Co.,Ltd
Web:http:// www.grtpower.com

臺灣	深圳
新北市汐止區新台五路一段 96 號 21F	深圳市福田区深南大道 7002 号财富广场 A 座 4V,
21F., No. 96, Sec. 1, Sintai 5th Rd., Sijhih City, Taipei County 22102, Taiwan, R.O.C.	4V, Tower A, Fortune Plaza, No. 7002, Shennan Road, Futian District, Shenzhen City, China PC : 518040
TEL:+886-2-2696 3558	TEL:+86-755-83709176
FAX:+886-2-2696 3559	FAX:+86-755-83709276