P-Channel Enhancement Mode Power MOSFET

Description

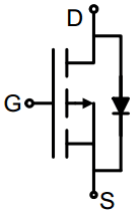
The G30P10T uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge. It can be used in a wide variety of applications.

General Features

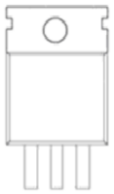
- V_{DS} -100V
- I_D (at V_{GS} = -10V) -41A
- $R_{DS(ON)}$ (at V_{GS} = -10V) < 37mΩ
- 100% Avalanche Tested
- RoHS Compliant

Application

- Power switch
- DC/DC converters



Schematic diagram


Marking and pin assignment

TO-220

Device	Package	Marking	Packaging
G30P10T	TO-220	G30P10	50pcs/Tube

Absolute Maximum Ratings T_C = 25ºC, unless otherwise noted

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	-100	V
Continuous Drain Current		I_D	-41	A
Pulsed Drain Current	(note1)	I_{DM}	-160	A
Gate-Source Voltage		V_{GS}	±20	V
Power Dissipation		P_D	123	W
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 To 150	ºC

Thermal Resistance

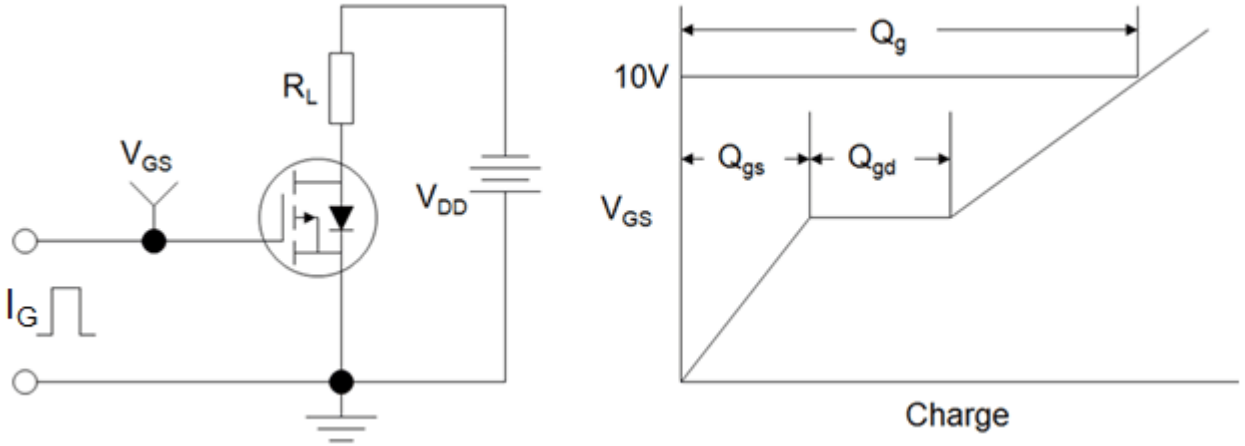
Parameter		Symbol	Value	Unit
Thermal Resistance, Junction-to-Case	(note3)	R_{thJC}	1.01	ºC/W

Specifications T_J = 25ºC, unless otherwise noted						
Parameter	**Symbol**	**Test Conditions**	**Value**			**Unit**
			Min.	**Typ.**	**Max.**	
Static Parameters						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = -250μA	-100	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = -100V, V_{GS} = 0V	--	--	-1	μA
Gate-Source Leakage	I_{GSS}	V_{GS} = ±20V	--	--	±100	nA
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = -250μA	-1.5	-2	-2.5	V
Drain-Source On-Resistance (note2)	$R_{DS(on)}$	V_{GS} = -10V, I_D = -22A	--	31	37	mΩ
Forward Transconductance	g_{FS}	V_{DS}=-5V,I_D=-22A	--	60	--	S
Dynamic Parameters						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = -50V, f = 1.0MHz	--	5612	--	pF
Output Capacitance	C_{oss}		--	180	--	
Reverse Transfer Capacitance	C_{rss}		--	80	--	
Total Gate Charge	Q_g	V_{DD} = -50V, I_D = -22A, V_{GS} = -10V	--	102	--	nC
Gate-Source Charge	Q_{gs}		--	25	--	
Gate-Drain Charge	Q_{gd}		--	19	--	
Turn-on Delay Time	$t_{d(on)}$	V_{DD} = -50V, I_D = -22A, R_G = 2.7Ω	--	15	--	ns
Turn-on Rise Time	t_r		--	38	--	
Turn-off Delay Time	$t_{d(off)}$		--	86	--	
Turn-off Fall Time	t_f		--	68	--	
Drain-Source Body Diode Characteristics						
Body Diode Voltage (note2)	V_{SD}	I_S = -22A, V_{GS} = 0V	--	--	-1.3	V
Reverse Recovery Time	T_{rr}	I_S = -22A, V_{GS} = 0V di/dt=-100A/us	--	36	--	nS
Recerse Recovery Charge	Q_{rr}		--	62	--	nC

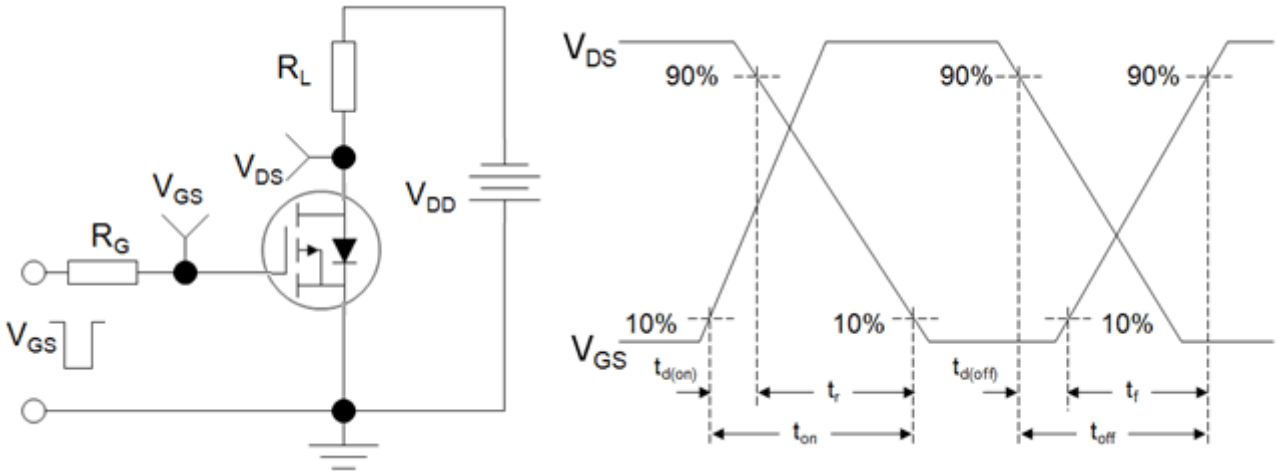
Notes

1.Pulse width limited by Max. junction temperature.
2.Pulse test
3.Surface mounted on 1 in^2 copper pad of FR4 board

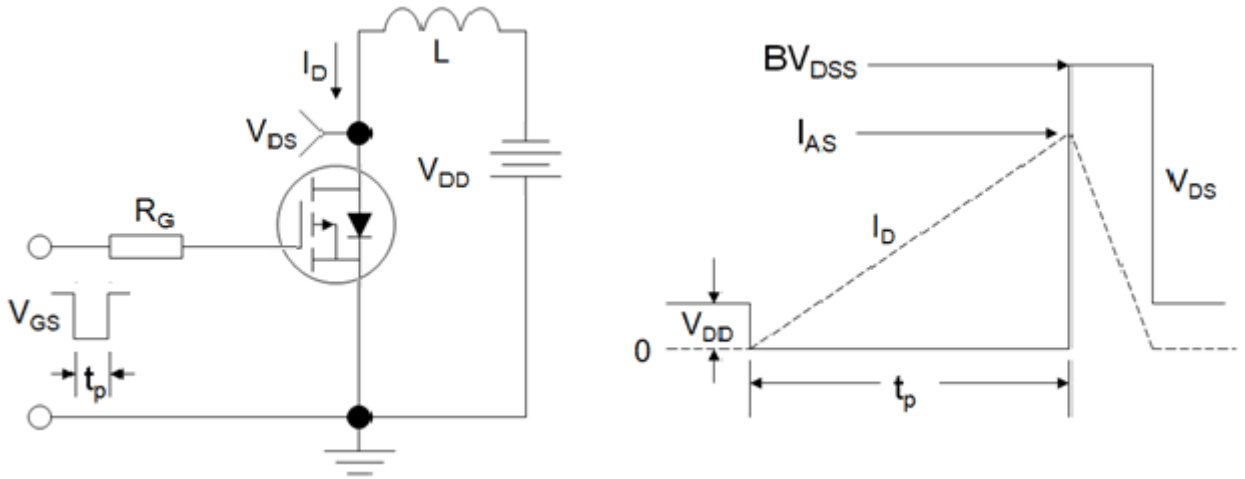
Gate Charge Test Circuit



Switch Time Test Circuit



EAS Test Circuit



Typical Characteristics T_J = 25ºC, unless otherwise noted

Figure 1. Output Characteristics

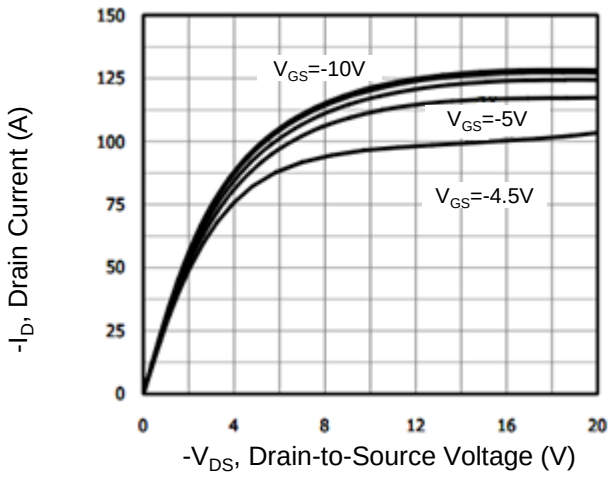


Figure 2. Transfer Characteristics

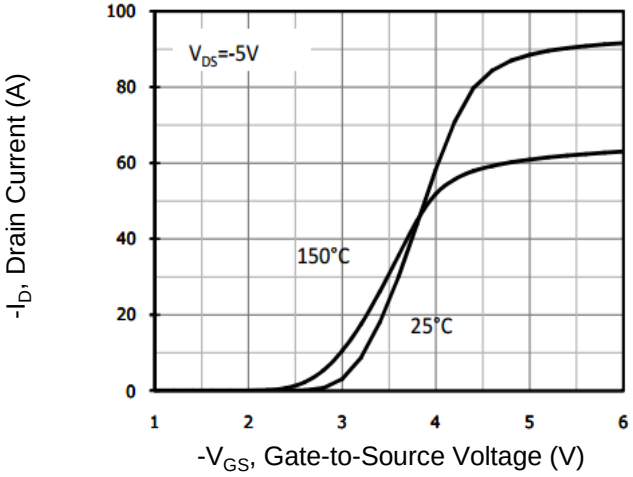


Figure 3. Drain Source On Resistance

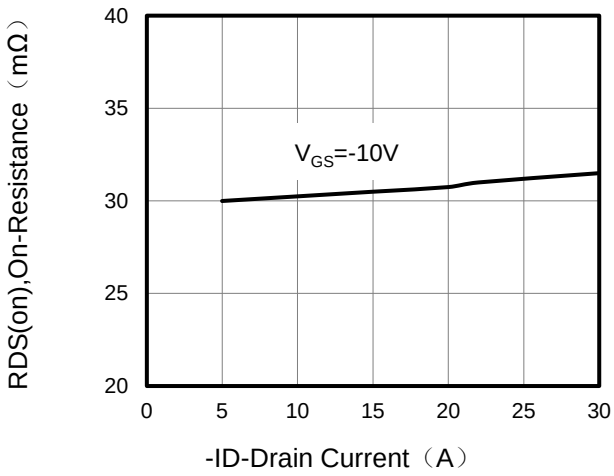


Figure 4. Gate Charge

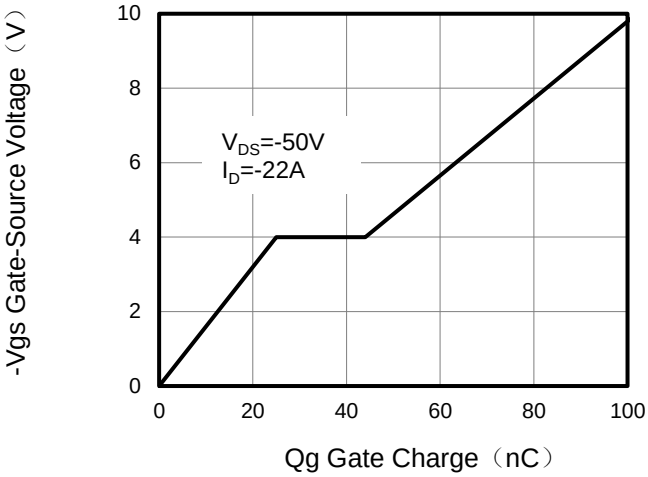


Figure 5. Capacitance vs Vds

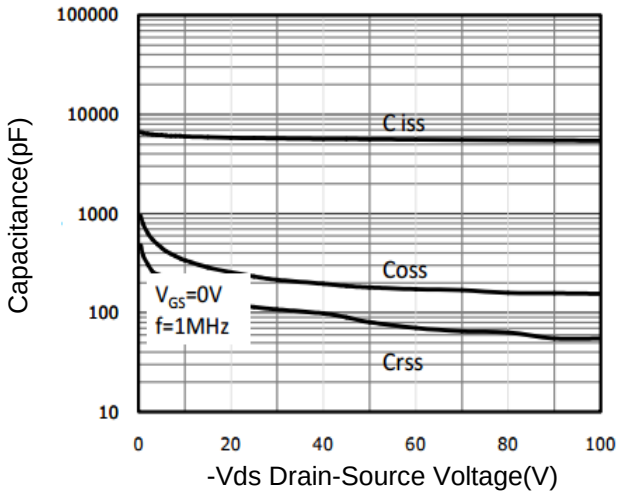
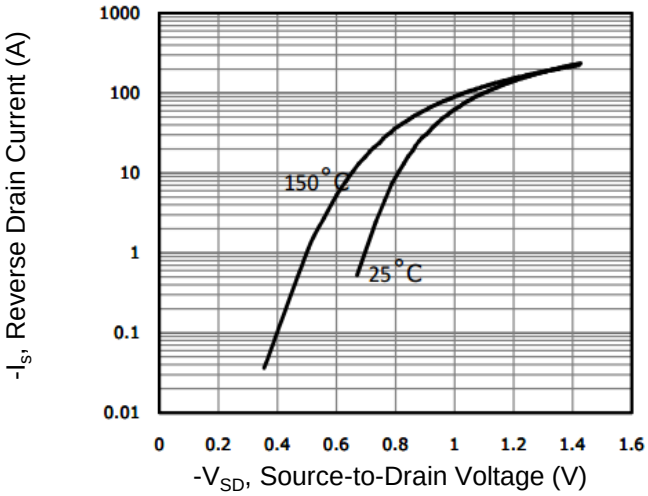


Figure 6. Source-Drain Diode Forward



Typical Characteristics T_J = 25ºC, unless otherwise noted

Figure 7. Drain-Source On-Resistance

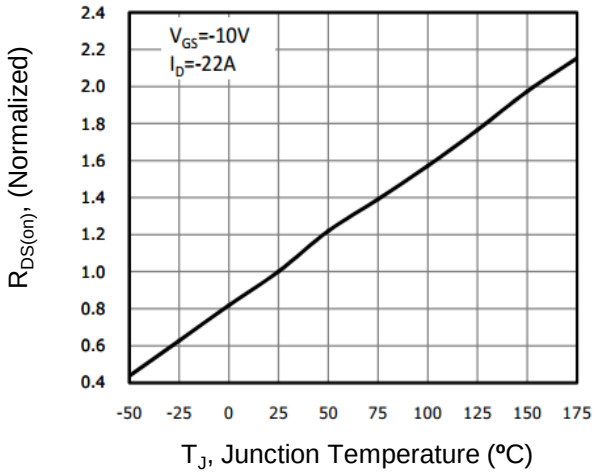


Figure 8. Safe Operation Area

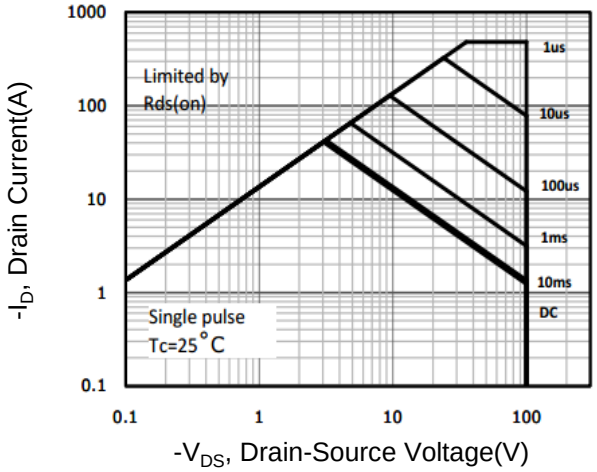
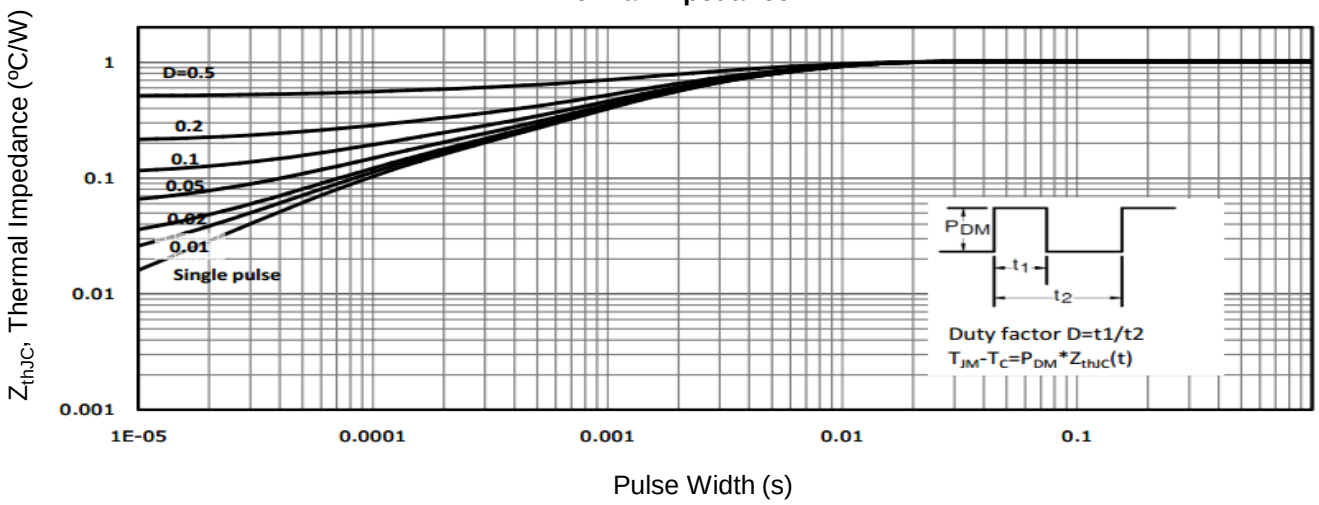
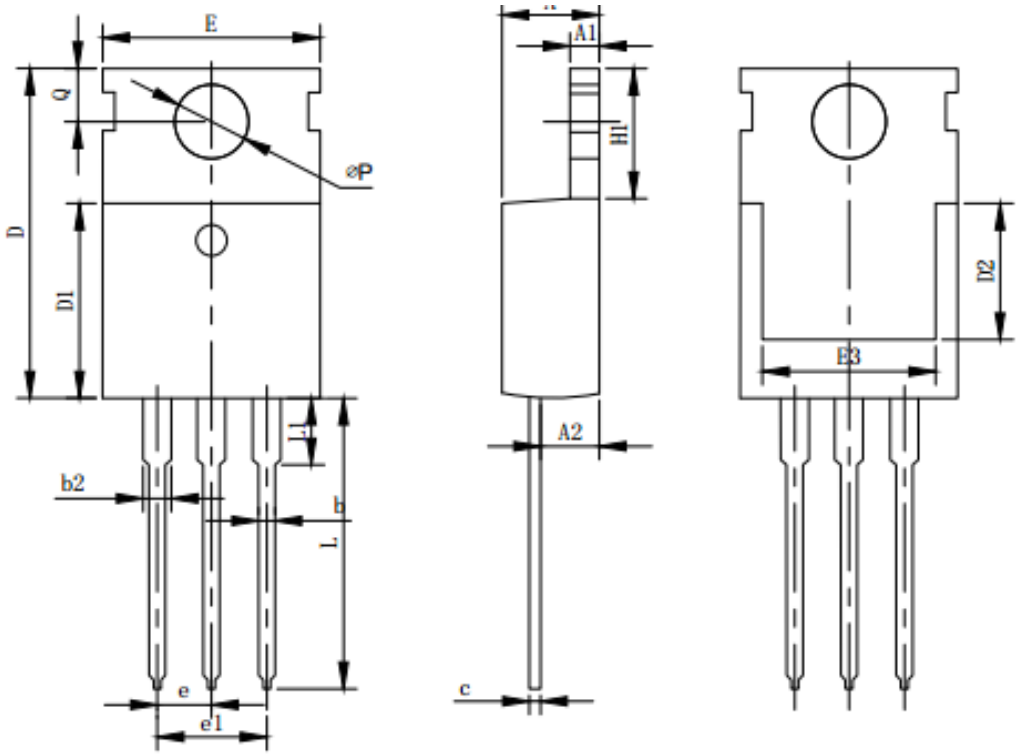


Figure 9. Normalized Maximum Transient Thermal Impedance



TO-220 Package Information



Symbol	Dimensions in Millimeters		
	MIN.	NOM.	MAX.
A	4.37	4.57	4.7
A1	1.25	1.3	1.4
A2	2.2	2.4	2.6
b	0.7	0.8	0.95
b2	1.7	1.27	1.47
c	0.45	0.5	0.6
D	15.1	15.6	16.1
D1	8.8	9.1	9.4
D2	5.5		
E	9.7	10	10.3
e	2.54BSC		
e1	5.08BSC		
H1	6.25	6.5	6.85
L	12.75	13.5	13.8
L1		3.1	3.4
ØP	3.4	3.6	3.8
Q	2.6	2.8	3