P-Channel Enhancement Mode Power MOSFET

Description

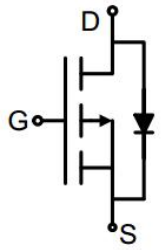
The G120P06M uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge. It can be used in a wide variety of applications.

General Features

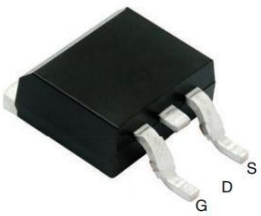
- V_{DS} -60V
- I_D (at V_{GS} = -10V) -120A
- $R_{DS(ON)}$ (at V_{GS} = -10V) < 8.5mΩ
- 100% Avalanche Tested
- RoHS Compliant

Application

- Power switch
- DC/DC converters



Schematic diagram



TO-263

Ordering Information

Device	Package	Marking	Packaging
G120P06M	TO-263	G120P06	800pcs/Reel

Absolute Maximum Ratings T_C = 25ºC, unless otherwise noted

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-60	V
Continuous Drain Current	I_D	-120	A
Pulsed Drain Current (note1)	I_{DM}	-480	A
Gate-Source Voltage	V_{GS}	±20	V
Power Dissipation	P_D	277	W
Single pulse avalanche energy （note2）	E_{AS}	650	mJ
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 To 150	ºC

Thermal Resistance

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-Ambient	R_{thJA}	65	ºC/W
Maximum Junction-to-Case	R_{thJC}	0.45	ºC/W

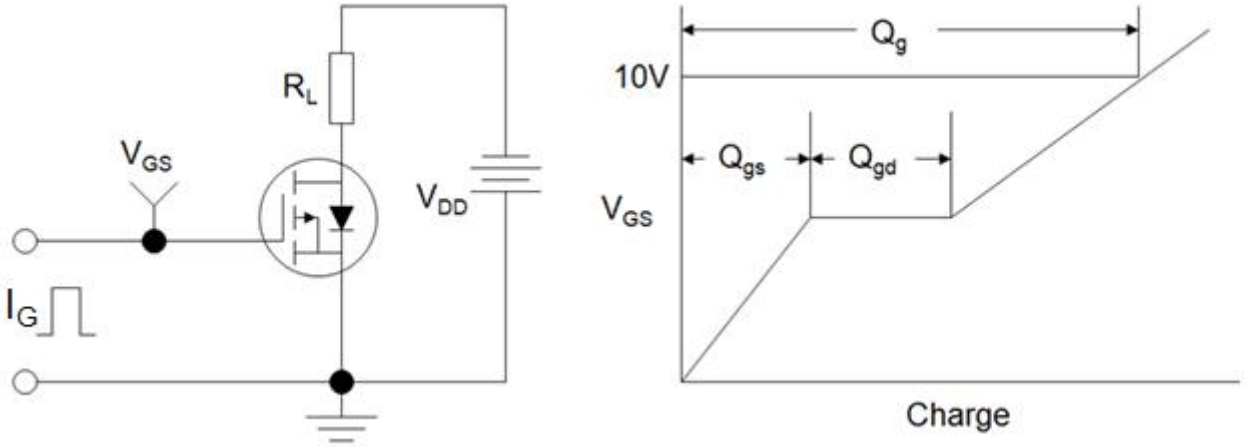
Specifications T_J = 25ºC, unless otherwise noted

Parameter	Symbol	Test Conditions	Value			Unit
			Min.	Typ.	Max.	
Static Parameters						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = -250μA	-60	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = -60V, 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	-2.5	-3	V
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS} = -10V, I_D = -20A	--	7	8.5	mΩ
Forward Transconductance	g_{FS}	V_{DS} = -5V,I_D = -20A	--	32	--	S
Dynamic Parameters						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = -30V, f = 1.0MHz	--	12215	--	pF
Output Capacitance	C_{oss}		--	946	--	
Reverse Transfer Capacitance	C_{rss}		--	673	--	
Total Gate Charge	Q_g	V_{DD} = -30V, I_D = -60A, V_{GS} = -10V	--	230	--	nC
Gate-Source Charge	Q_{gs}		--	50	--	
Gate-Drain Charge	Q_{gd}		--	35	--	
Turn-on Delay Time	$t_{d(on)}$	V_{DD} = -30V, I_D = -60A, R_G = 1Ω	--	20	--	ns
Turn-on Rise Time	t_r		--	25	--	
Turn-off Delay Time	$t_{d(off)}$		--	110	--	
Turn-off Fall Time	t_f		--	50	--	
Drain-Source Body Diode Characteristics						
Continuous Body Diode Current	I_S	T_C = 25ºC	--	--	-120	A
Body Diode Voltage	V_{SD}	T_J = 25ºC, I_{SD} = -20A, V_{GS} = 0V	--	--	-1.2	V
Reverse Recovery Charge	Q_{rr}	I_F = -30A, V_{GS} = 0V di/dt=-100A/us	--	0.21	--	nC
Reverse Recovery Time	T_{rr}		--	91	--	ns

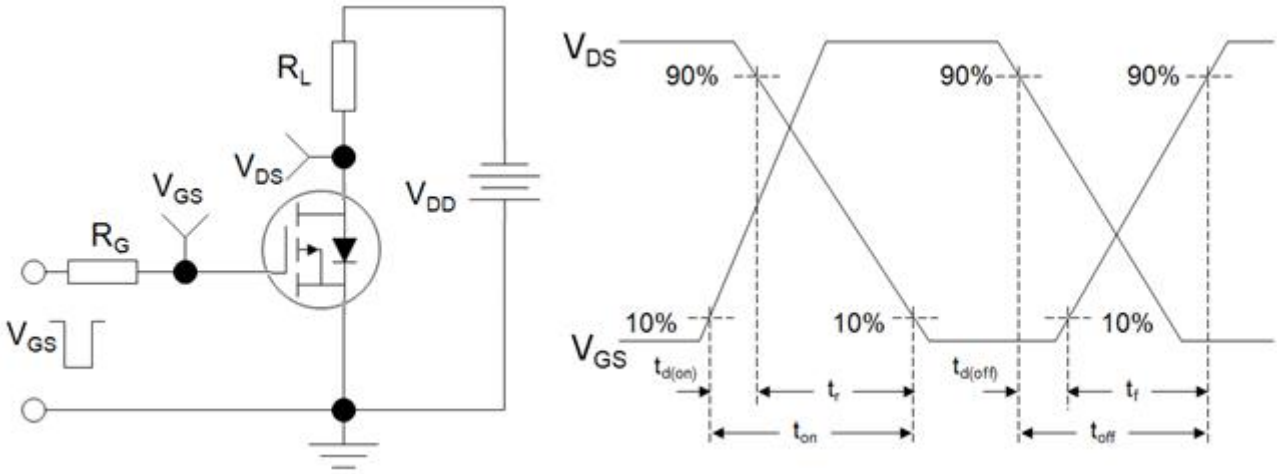
Notes

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. Identical low side and high side switch with identical R_G
3. EAS condition : Tj=25℃ ,VDD=-50V,VGS=-10V,L=0.5mH,Rg=25Ω

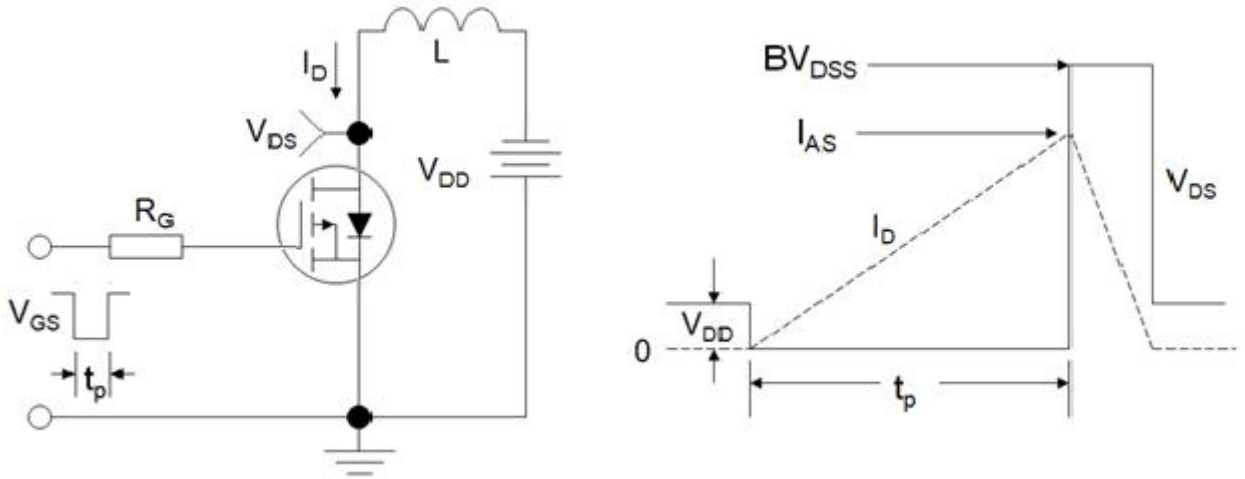
Gate Charge Test Circuit



Switch Time Test Circuit



EAS Test Circuit



Typical Characteristics T_J = 25ºC, unless otherwise noted

Figure 1. Output Characteristics

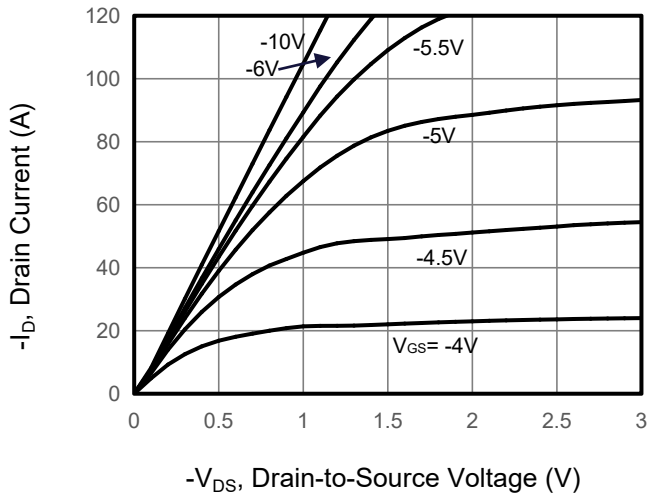


Figure 2. Transfer Characteristics

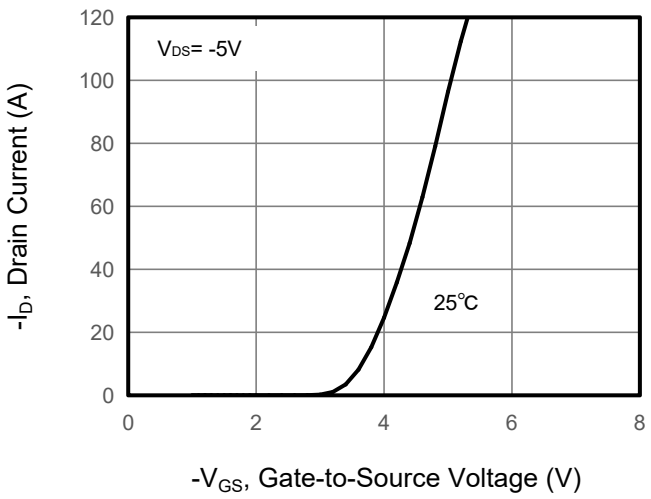


Figure 3.Drain Source On Resistance

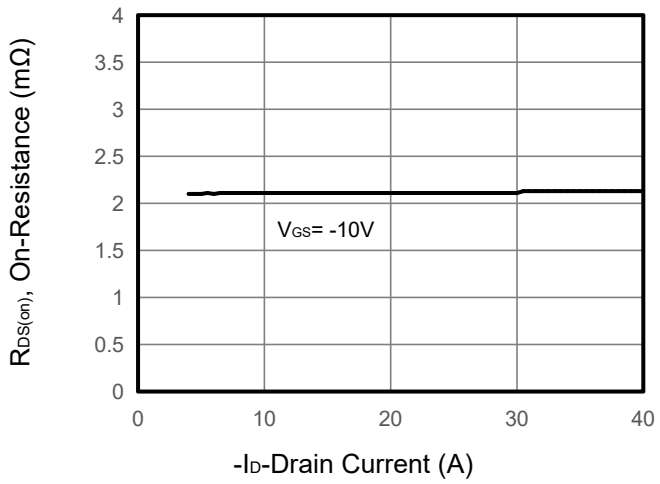


Figure 4. Gate Charge

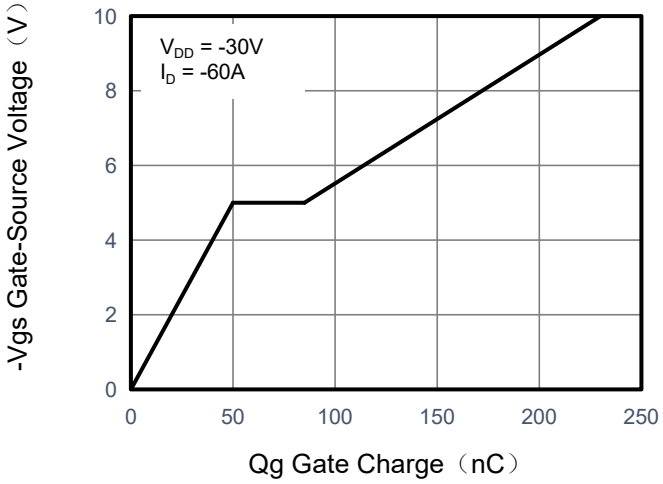


Figure 5. Capacitance

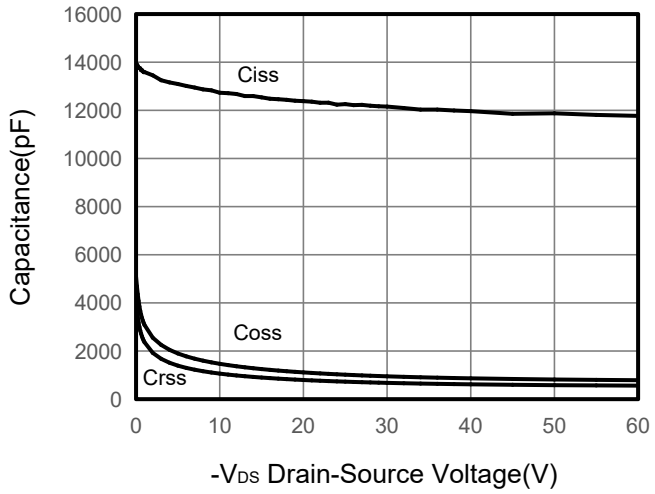
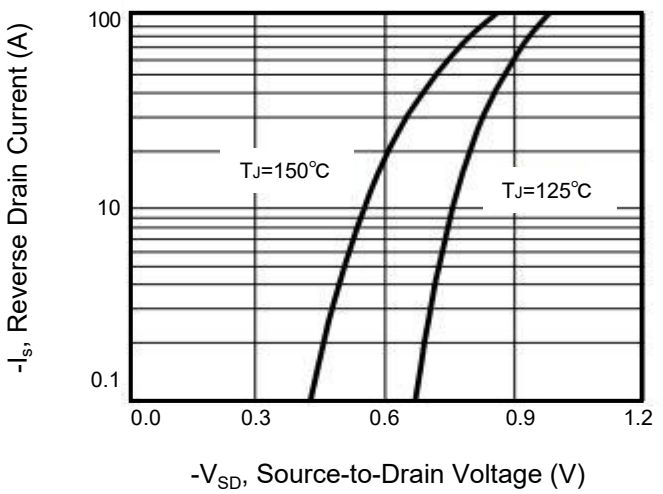


Figure 6. Source-Drain Diode Forward



Typical Characteristics T_J = 25ºC, unless otherwise noted

Figure 7. Drain-Source On-Resistance

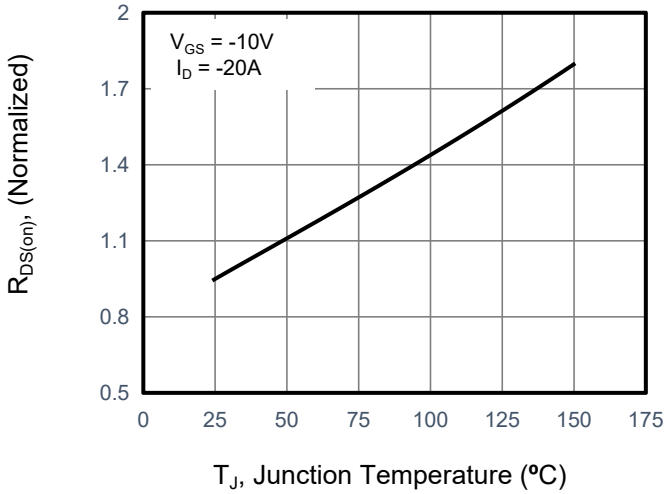


Figure 10. Safe Operation Area

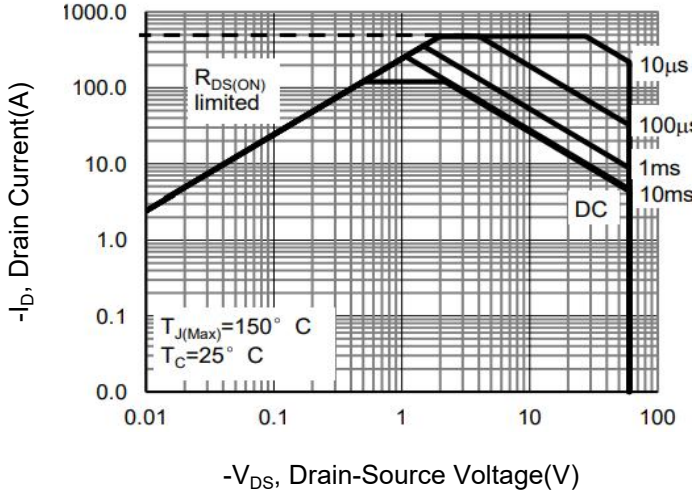
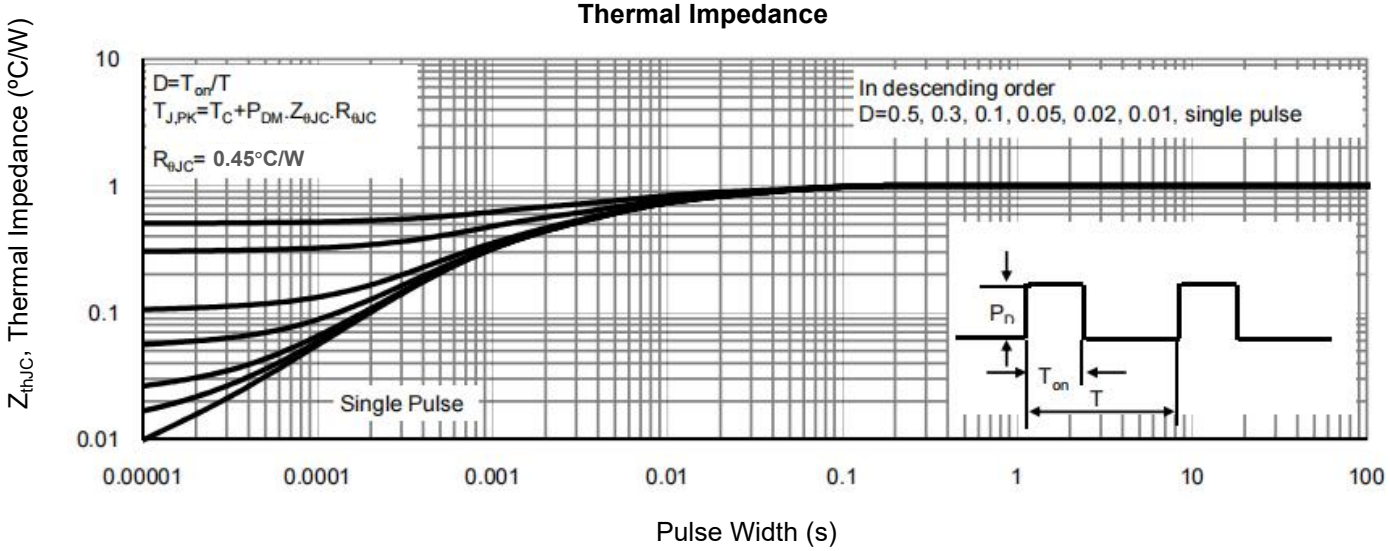
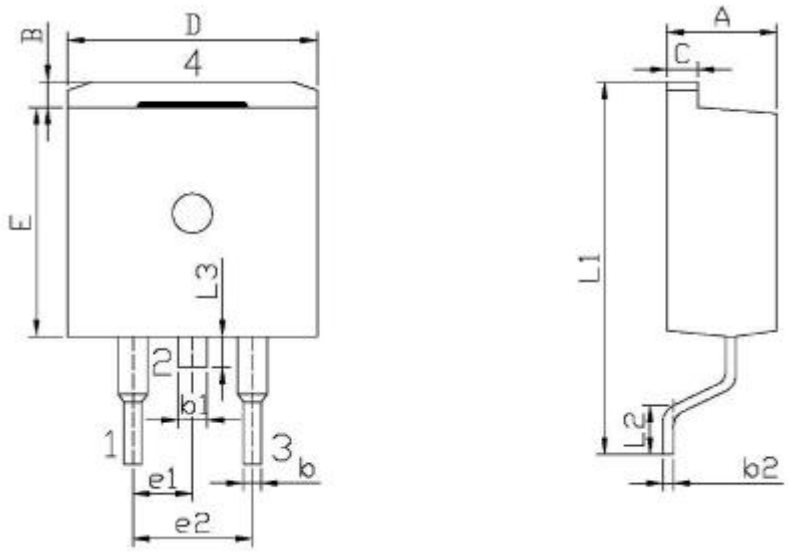


Figure 9. Normalized Maximum Transient Thermal Impedance



TO-263 Package Mechanical Data



UNIT:mm

	MIN	MAX
A	4.30	4.70
B	1.00	1.40
b	0.70	0.90
b1	1.15	1.35
b2	0.40	0.60
C	1.20	1.40
D	9.80	10.20
E	9.00	9.40
e1	2.34	2.74
e2	4.88	5.28
L1	15.00	16.00
L2	2.24	2.84
L3	1.20	1.60

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