

General Description

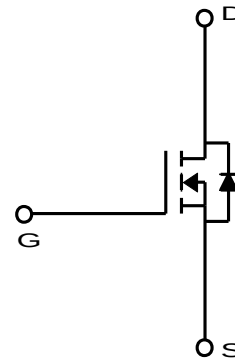
The MDP1921 uses advanced MagnaChip's MOSFET Technology, which provides high performance in on-state resistance, fast switching performance and excellent quality. MDP1921 is suitable device for DC/DC Converter and general purpose applications.

Features

- $V_{DS} = 100V$
- $I_D = 120A$ @ $V_{GS} = 10V$
- $R_{DS(ON)} < 4.5 m\Omega$ @ $V_{GS} = 10V$
- 100% UIL Tested
- 100% Rg Tested



TO-220



Absolute Maximum Ratings ($T_a = 25^\circ C$)

Characteristics		Symbol	Rating	Unit
Drain-Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	± 20	V
Continuous Drain Current ⁽¹⁾	$T_c = 25^\circ C$ (Silicon Limited)	I_D	153	A
	$T_c = 25^\circ C$ (Package Limited)		120	
	$T_c = 100^\circ C$		97	
Pulsed Drain Current		I_{DM}	480	
Power Dissipation	$T_c = 25^\circ C$	P_D	223	W
	$T_c = 100^\circ C$		89	
Single Pulse Avalanche Energy ⁽²⁾		E_{AS}	609	mJ
Junction and Storage Temperature Range		T_J, T_{stg}	-55~150	$^\circ C$

Thermal Characteristics

Characteristics	Symbol	Rating	Unit
Thermal Resistance, Junction-to-Ambient ⁽¹⁾	$R_{\theta JA}$	62.5	$^\circ C/W$
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.56	

Ordering Information

Part Number	Temp. Range	Package	Packing	RoHS Status
MDP1921TH	-55~150°C	TO-220	Tube	Halogen Free

Electrical Characteristics (T_J =25°C)

Characteristics	Symbol	Test Condition	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	I _D = 250μA, V _{GS} = 0V	100	-	-	V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250μA	2.0	2.9	4.0	
Drain Cut-Off Current	I _{DSS}	V _{DS} = 80V, V _{GS} = 0V	-	-	1.0	μA
Gate Leakage Current	I _{GSS}	V _{GS} = ±20V, V _{DS} = 0V	-	-	±0.1	
Drain-Source ON Resistance	R _{DS(on)}	V _{GS} = 10V, I _D = 50A	-	3.8	4.5	mΩ
Forward Transconductance	g _{fs}	V _{DS} = 10V, I _D = 50A	-	120	-	S
Dynamic Characteristics						
Total Gate Charge	Q _g	V _{DS} = 50V, I _D = 50A, V _{GS} = 10V	-	100	-	nC
Gate-Source Charge	Q _{gs}		-	27	-	
Gate-Drain Charge	Q _{gd}		-	26	-	
Input Capacitance	C _{iss}	V _{DS} = 40V, V _{GS} = 0V, f = 1.0MHz	-	6750	-	pF
Reverse Transfer Capacitance	C _{rss}		-	50	-	
Output Capacitance	C _{oss}		-	1300	-	
Turn-On Delay Time	t _{d(on)}	V _{GS} = 10V, V _{DS} = 50V, I _D = 50A, R _G = 3.0Ω	-	30.4	-	ns
Rise Time	t _r		-	28.8	-	
Turn-Off Delay Time	t _{d(off)}		-	93.0	-	
Fall Time	t _f		-	34.2	-	
Gate Resistance	R _g	f=1 MHz	-	2.5	-	Ω
Drain-Source Body Diode Characteristics						
Source-Drain Diode Forward Voltage	V _{SD}	I _S = 50A, V _{GS} = 0V	-	0.9	1.2	V
Body Diode Reverse Recovery Time	t _{rr}	I _F = 50A, di/dt = 100A/μs	-	73		ns
Body Diode Reverse Recovery Charge	Q _{rr}		-	150		nC

Note :

1. Surface mounted FR-4 board by JEDEC (jesd51-7). Continuous current at T_c=25°C is silicon limited
2. E_{AS} is tested at starting T_j = 25°C, L = 1.0mH, I_{AS} = 28.0A, V_{GS} = 10V.

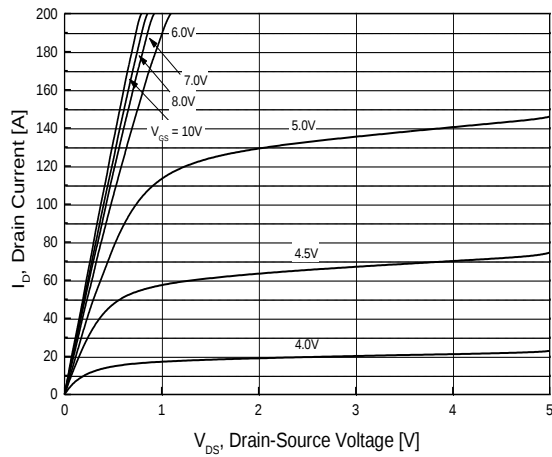


Fig.1 On-Region Characteristics

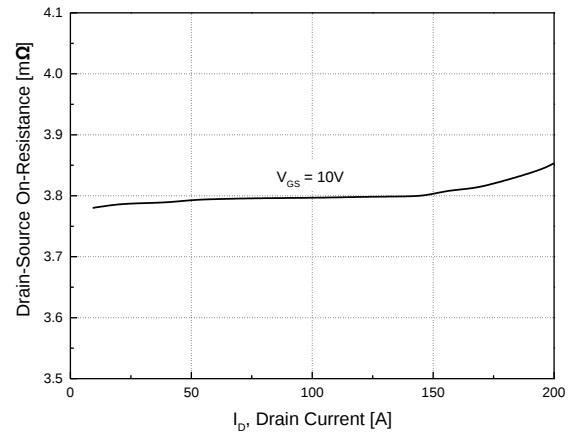


Fig.2 On-Resistance Variation with Drain Current and Gate Voltage

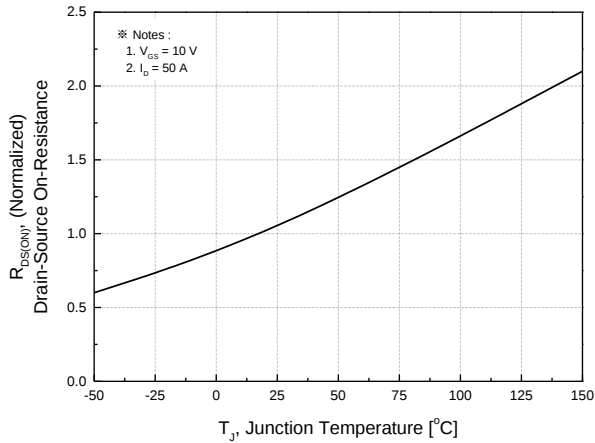


Fig.3 On-Resistance Variation with Temperature

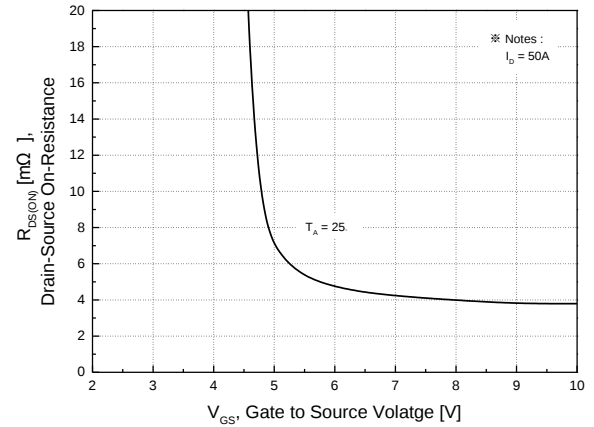


Fig.4 On-Resistance Variation with Gate to Source Voltage

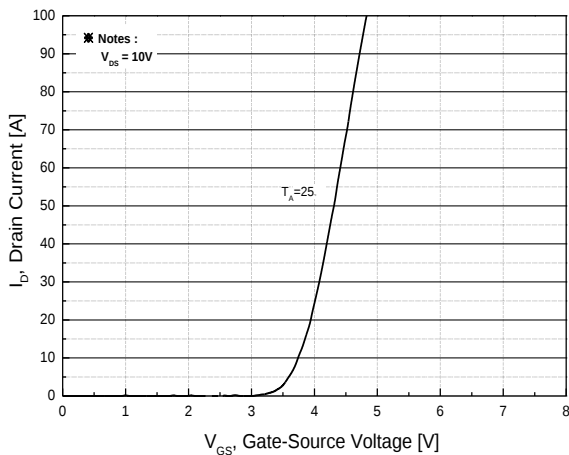


Fig.5 Transfer Characteristics

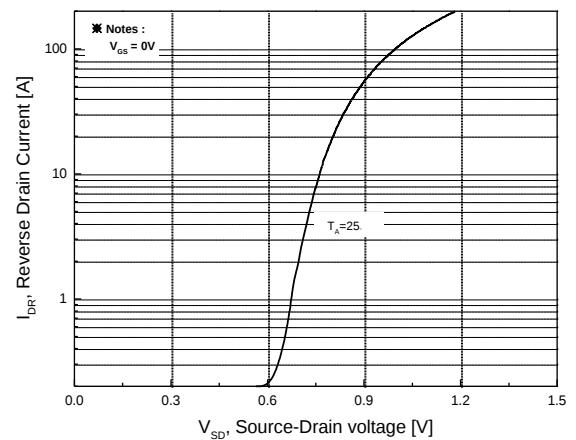
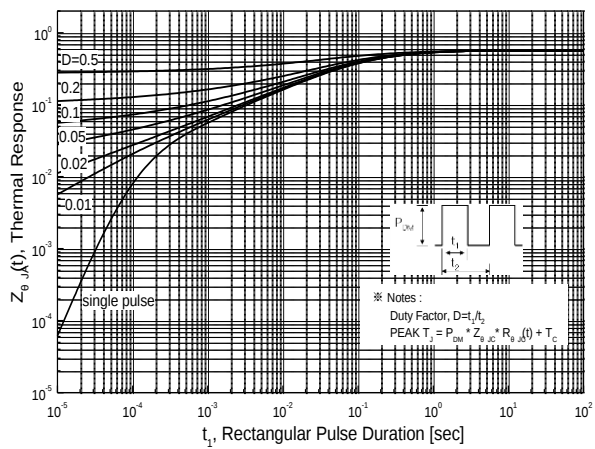
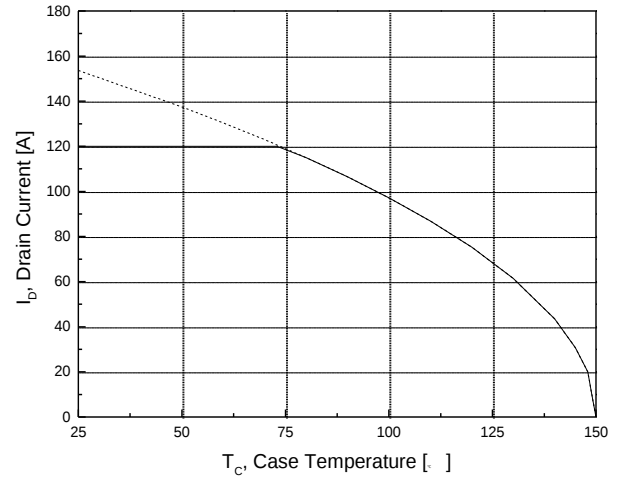
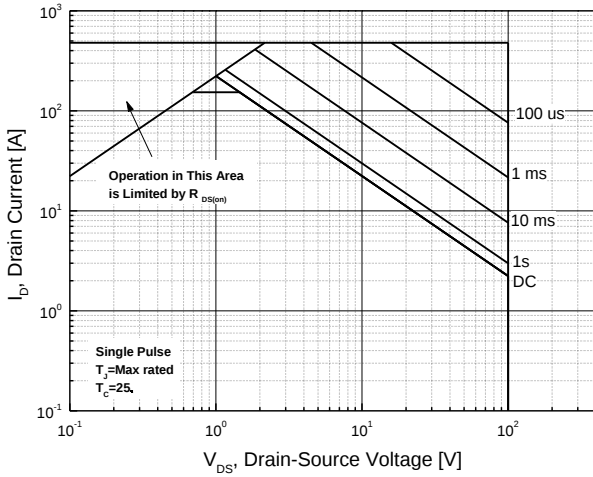
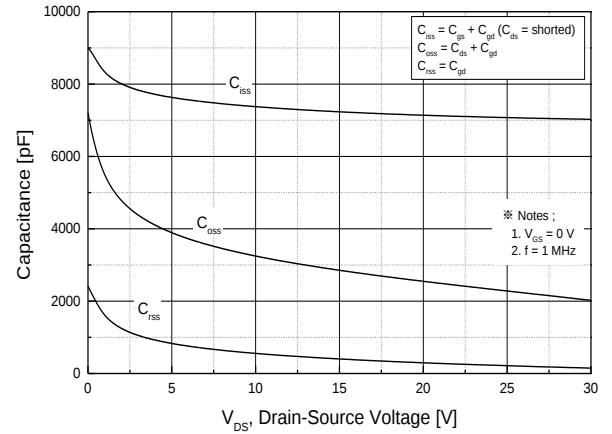
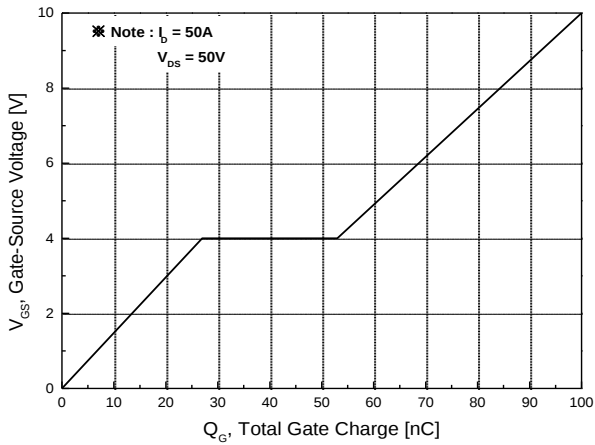


Fig.6 Body Diode Forward Voltage Variation with Source Current and Temperature



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