

MDP1901

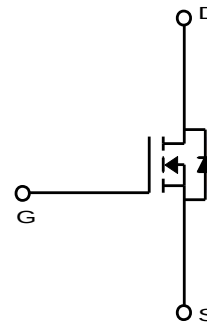
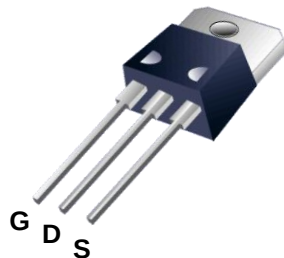
Single N-channel Trench MOSFET 100V, 36A, 22mΩ

General Description

The MDP1901 uses advanced MagnaChip's MOSFET Technology, which provides high performance in on-state resistance, fast switching performance and excellent quality. MDP1901 is suitable device for DC/DC Converters and general purpose applications.

Features

- $V_{DS} = 100V$
- $I_D = 36A$ @ $V_{GS} = 10V$
- $R_{DS(ON)} < 22m\Omega$ @ $V_{GS} = 10V$
 $< 25m\Omega$ @ $V_{GS} = 6.0V$



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

Characteristics		Symbol	Rating	Unit
Drain-Source Voltage		V_{DSS}	100	V
Gate-Source Voltage		V_{GSS}	± 20	V
Continuous Drain Current	$T_C = 25^\circ C$	I_D	36	A
	$T_C = 100^\circ C$		24	A
Pulsed Drain Current		I_{DM}	144	A
Power Dissipation	$T_C = 25^\circ C$	P_D	34	W
	$T_C = 100^\circ C$		14	
Single Pulse Avalanche Energy ⁽²⁾		E_{AS}	200	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	$R_{\theta JA}$	40	$^\circ C/W$
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	2.3	

Ordering Information

Part Number	Temp. Range	Package	Packing	Rohs Status
MDP1901TH	-55~150°C	TO-220	Tube	Halogen Free

Electrical Characteristics (Tc =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	2.8	4.0	
Drain Cut-Off Current	I _{DSS}	V _{DS} = 80V, V _{GS} = 0V	-	-	1	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 = 35A	-	17	22	mΩ
		T _J =125°C	-	28	33	
		V _{GS} = 6.0V, I _D = 20A		19	25	
Forward Transconductance	g _{fs}	V _{DS} = 5V, I _D = 35A	-	35	-	S
Dynamic Characteristics						
Total Gate Charge	Q _g	V _{DS} = 50V, I _D = 20A, V _{GS} = 10V	-	75	110	nC
Gate-Source Charge	Q _{gs}		-	20	-	
Gate-Drain Charge	Q _{gd}		-	18	-	
Input Capacitance	C _{iss}	V _{DS} = 30V, V _{GS} = 0V, f = 1.0MHz	-	3045	-	pF
Reverse Transfer Capacitance	C _{rss}		-	160	-	
Output Capacitance	C _{oss}		-	234	-	
Gate Resistance	R _g	V _{GS} =0V,V _{DS} =0V,F=1MHz	-	0.81	-	Ω
Turn-On Delay Time	t _{d(on)}	V _{GS} = 10V, V _{DS} = 50V, R _L = 30Ω, R _G = 6Ω	-	25	40	ns
Rise Time	t _r		-	12	20	
Turn-Off Delay Time	t _{d(off)}		-	70	120	
Fall Time	t _f		-	20	35	
Drain-Source Body Diode Characteristics						
Source-Drain Diode Forward Voltage	V _{SD}	I _S = 1A, V _{GS} = 0V	-	0.7	1.2	V
Body Diode Reverse Recovery Time	t _{rr}	I _F = 20A, dI/dt = 100A/μs	-	70	100	ns
Body Diode Reverse Recovery Charge	Q _{rr}		-	240	-	nC

Note :

1. Surface mounted RF4 board with 2oz. Copper.
2. Starting $T_J=25^\circ C$, $L=1mH$, $I_{AS}=20A$, $V_{DD}=50V$, $V_{GS}=10V$

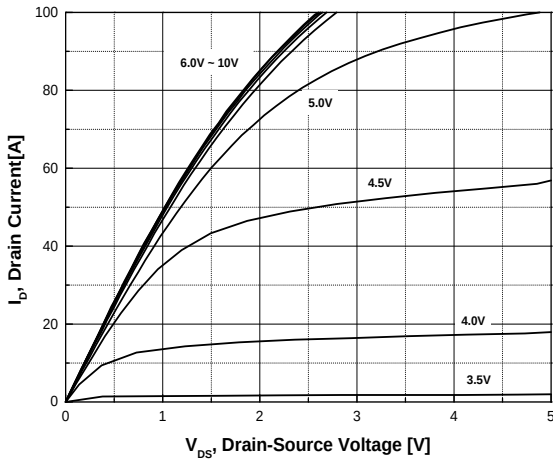


Fig.1 On-Region Characteristics

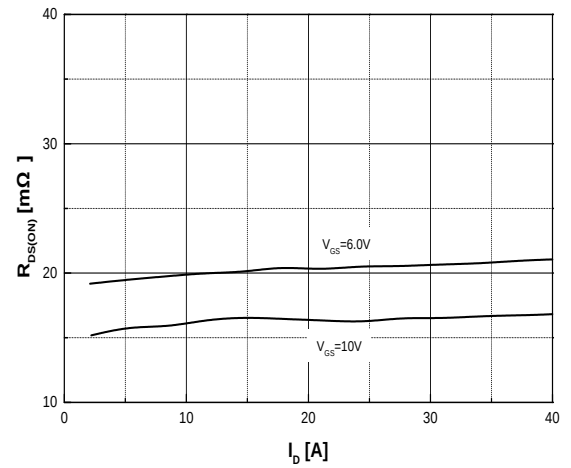


Fig.2 On-Resistance Variation with Drain Current and Gate Voltage

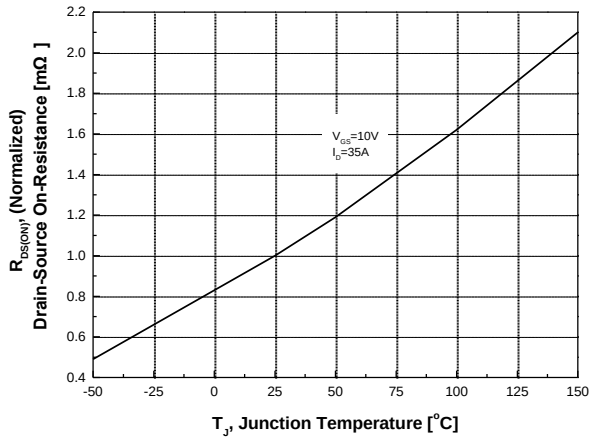


Fig.3 On-Resistance Variation with Temperature

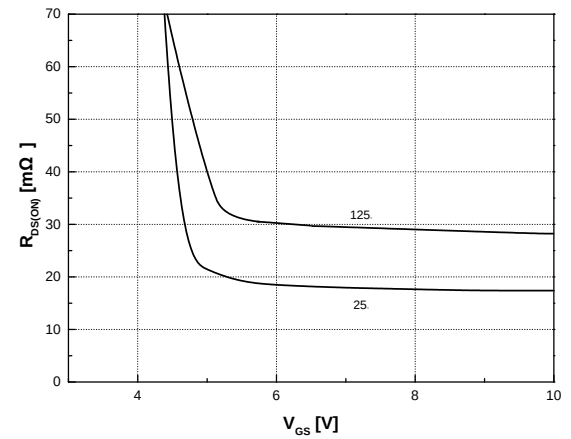


Fig.4 On-Resistance Variation with Gate to Source Voltage

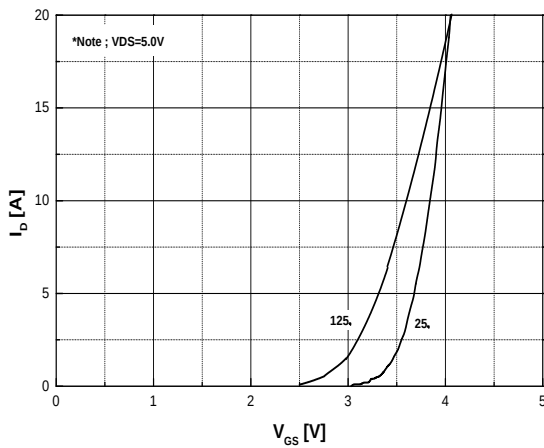


Fig.5 Transfer Characteristics

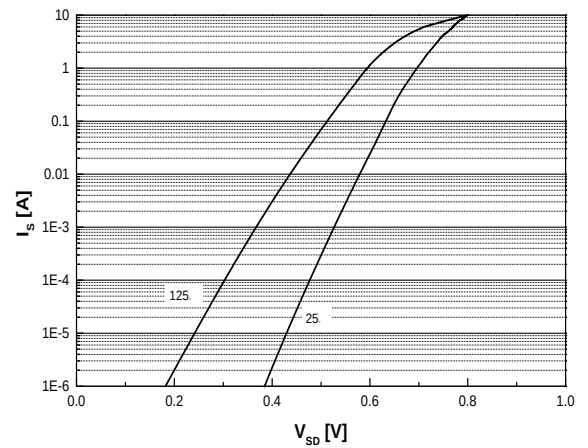


Fig.6 Body Diode Forward Voltage Variation with Source Current and Temperature

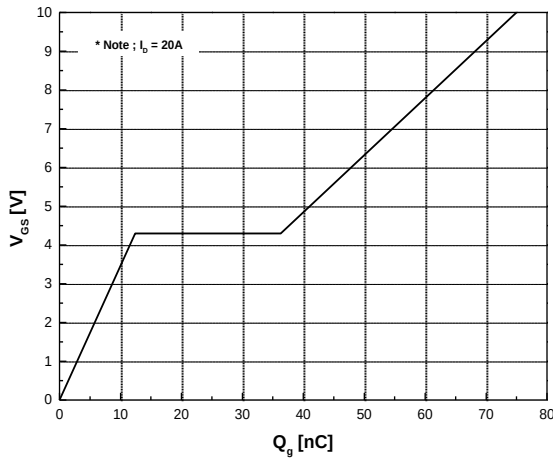


Fig.7 Gate Charge Characteristics

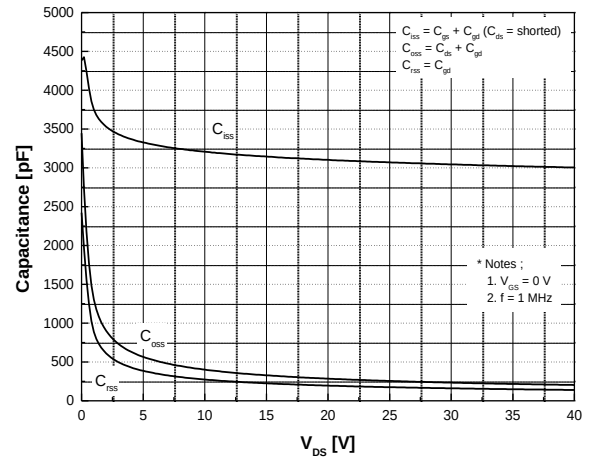


Fig.8 Capacitance Characteristics

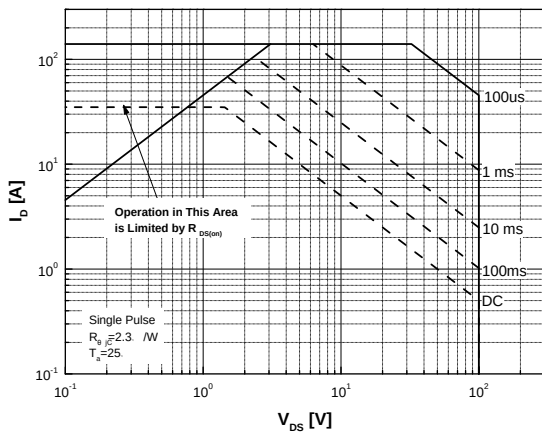


Fig.9 Maximum Safe Operating Area

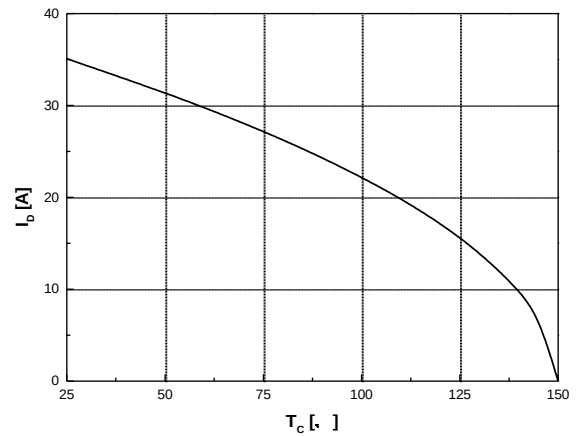


Fig.10 Maximum Drain Current vs. Case Temperature

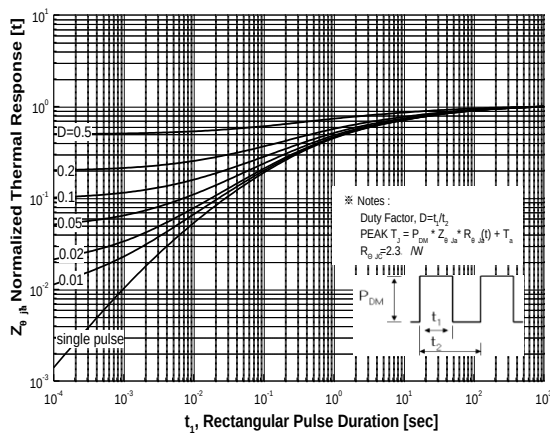
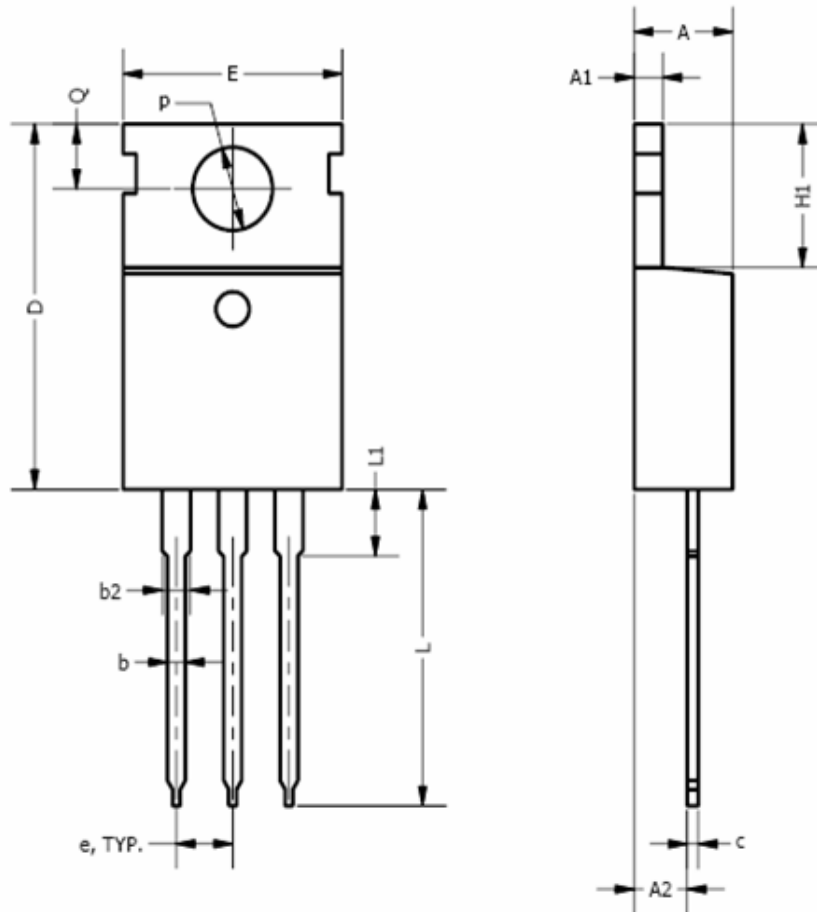


Fig.11 Transient Thermal Response Curve

Physical Dimensions

3 Leads, TO-220

Dimensions are in millimeters unless otherwise specified



Symbol	Min	Nom	Max
A	3.56		4.83
A1	0.50		1.40
A2	2.03		2.92
b	0.38	0.69	1.02
b2	1.14	1.45	1.78
c	0.36		0.61
D	14.22		16.51
e	2.54 TYP		
E	9.65		10.67
H1	5.84		6.86
L	12.70		14.73
L1			6.35
ϕP	3.53		4.09
Q	2.54		3.43

DISCLAIMER:

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