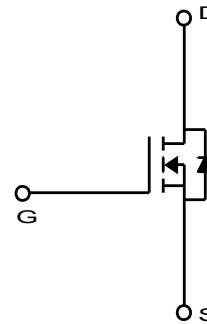
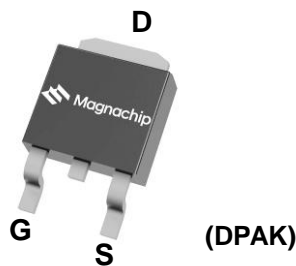


### General Description

The MDD1901 uses advanced Magnachip's MOSFET Technology, which provides high performance in on-state resistance, fast switching performance and excellent quality. MDD1901 is suitable device for DC/DC Converters and general purpose applications.

### Features

- $V_{DS} = 100V$
- $I_D = 40A$  @  $V_{GS} = 10V$
- $R_{DS(ON)}$   
 $< 22m\Omega$  @  $V_{GS} = 10V$   
 $< 25m\Omega$  @  $V_{GS} = 6.0V$



### Absolute Maximum Ratings (Tc = 25°C)

Characteristics	Symbol	Rating	Unit	
Drain-Source Voltage	$V_{DSS}$	100	V	
Gate-Source Voltage	$V_{GSS}$	$\pm 20$	V	
Continuous Drain Current <sup>(1)</sup>	$I_D$	$T_C=25^\circ C$	40	A
		$T_C=100^\circ C$	24	A
Pulsed Drain Current	$I_{DM}$	80	A	
Power Dissipation	$P_D$	$T_C=25^\circ C$	70	W
		$T_C=100^\circ C$	28	
Single Pulse Avalanche Energy <sup>(2)</sup>	$E_{AS}$	200	mJ	
Junction and Storage Temperature Range	$T_J, T_{stg}$	-55~150	°C	

### Thermal Characteristics

Characteristics	Symbol	Rating	Unit
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	40	°C/W
Thermal Resistance, Junction-to-Case <sup>(1)</sup>	$R_{\theta JC}$	1.8	

## Ordering Information

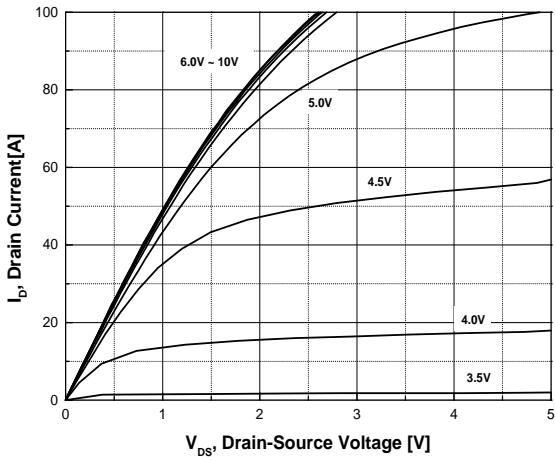
Part Number	Temp. Range	Package	Packing	Rohs Status
MDD1901RH	-55~150°C	DPAK	Tape & Reel	Halogen Free

## Electrical Characteristics (Tc =25°C)

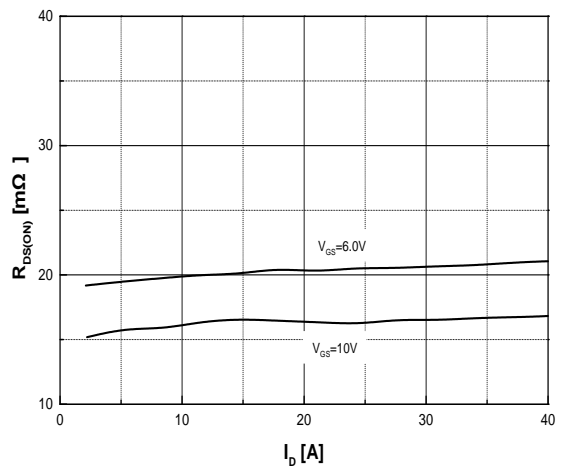
Characteristics	Symbol	Test Condition	Min	Typ	Max	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$I_D = 250\mu A, V_{GS} = 0V$	100	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	2.0	2.8	4.0	
Drain Cut-Off Current	$I_{DSS}$	$V_{DS} = 80V, V_{GS} = 0V$	-	-	1	$\mu A$
Gate Leakage Current	$I_{GSS}$	$V_{GS} = \pm 20V, V_{DS} = 0V$	-	-	$\pm 0.1$	
Drain-Source ON Resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 35A$	-	17	22	m $\Omega$
		$T_J = 125^\circ C$	-	28	33	
		$V_{GS} = 6.0V, I_D = 20A$		19	25	
Forward Transconductance	$g_{fs}$	$V_{DS} = 5V, I_D = 35A$	-	35	-	S
<b>Dynamic Characteristics</b>						
Total Gate Charge	$Q_g$	$V_{DS} = 50V, I_D = 20A, V_{GS} = 10V$	-	75	100	nC
Gate-Source Charge	$Q_{gs}$		-	12	-	
Gate-Drain Charge	$Q_{gd}$		-	20	-	
Input Capacitance	$C_{iss}$	$V_{DS} = 30V, V_{GS} = 0V, f = 1.0MHz$	-	3090	-	pF
Reverse Transfer Capacitance	$C_{rss}$		-	160	-	
Output Capacitance	$C_{oss}$		-	235	-	
Gate Resistance	$R_g$	$V_{GS}=0V, V_{DS}=0V, F=1MHz$	-	0.8	-	$\Omega$
Turn-On Delay Time	$t_{d(on)}$	$V_{DS}=50V, V_{GS}=10V, R_L=1.15\Omega, R_{GEN}=2.5\Omega$	-	15	21	ns
Rise Time	$t_r$		-	26	36	
Turn-Off Delay Time	$t_{d(off)}$		-	69	96	
Fall Time	$t_f$		-	15	21	
<b>Drain-Source Body Diode Characteristics</b>						
Source-Drain Diode Forward Voltage	$V_{SD}$	$I_S = 1A, V_{GS} = 0V$	-	0.7	1.2	V
Body Diode Reverse Recovery Time	$t_{rr}$	$I_F = 20A, di/dt = 100A/\mu s$	-	70	100	ns
Body Diode Reverse Recovery Charge	$Q_{rr}$		-	240	-	nC

Note :

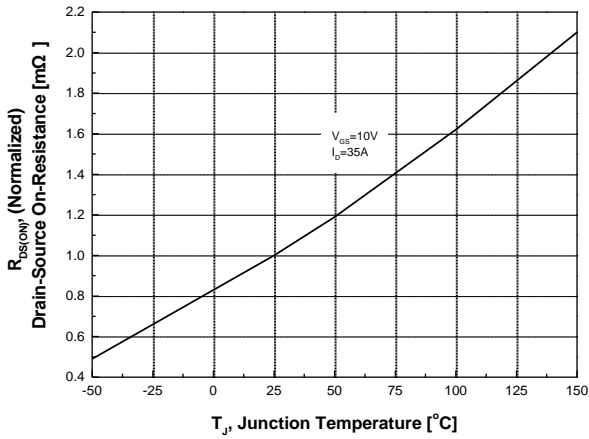
1. Surface mounted RF4 board with 2oz. Copper.
2. Starting  $T_J=25^\circ C, L=1mH, I_{AS}=20A, V_{DD}=50V, V_{GS}=10V$



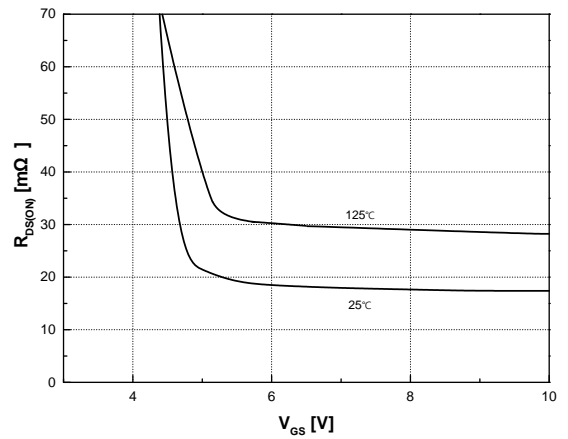
**Fig.1 On-Region Characteristics**



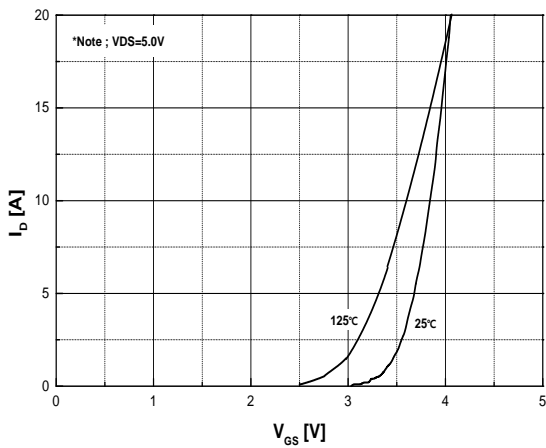
**Fig.2 On-Resistance Variation with Drain Current and Gate Voltage**



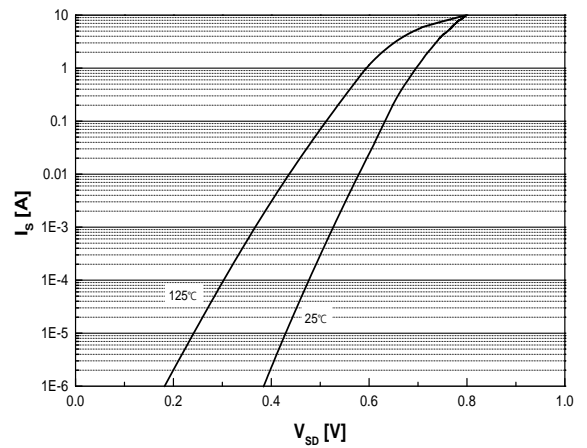
**Fig.3 On-Resistance Variation with Temperature**



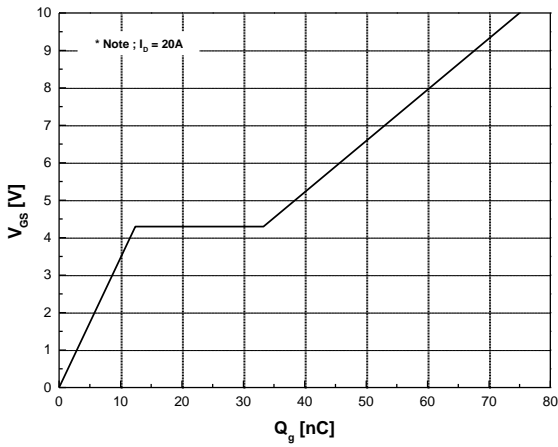
**Fig.4 On-Resistance Variation with Gate to Source Voltage**



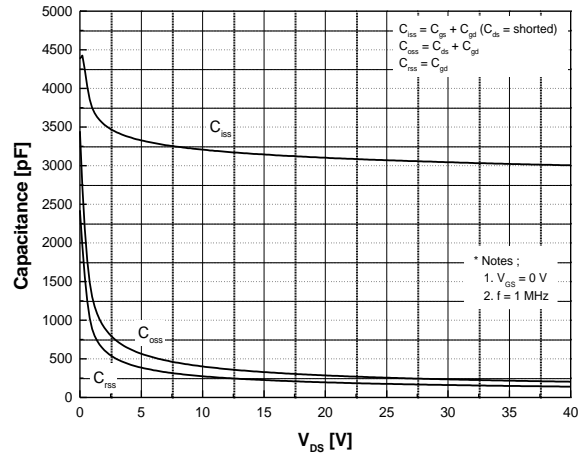
**Fig.5 Transfer Characteristics**



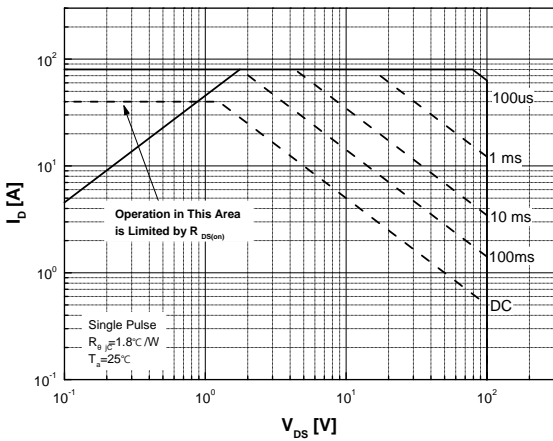
**Fig.6 Body Diode Forward Voltage Variation with Source Current and Temperature**



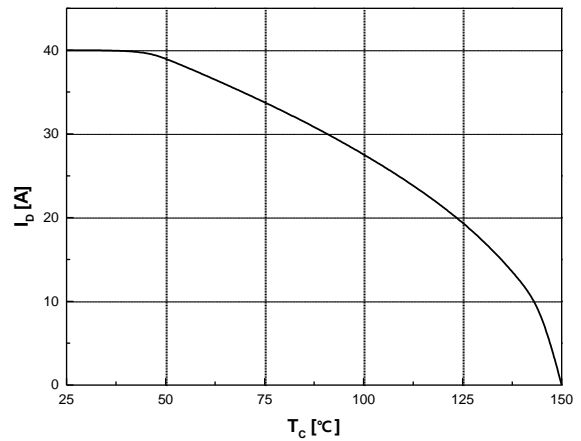
**Fig.7 Gate Charge Characteristics**



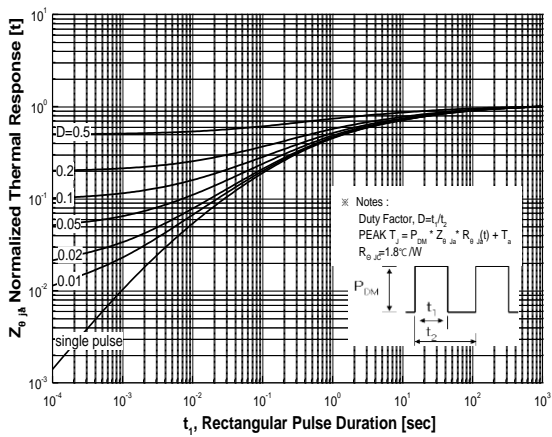
**Fig.8 Capacitance Characteristics**



**Fig.9 Maximum Safe Operating Area**



**Fig.10 Maximum Drain Current vs. Case Temperature**

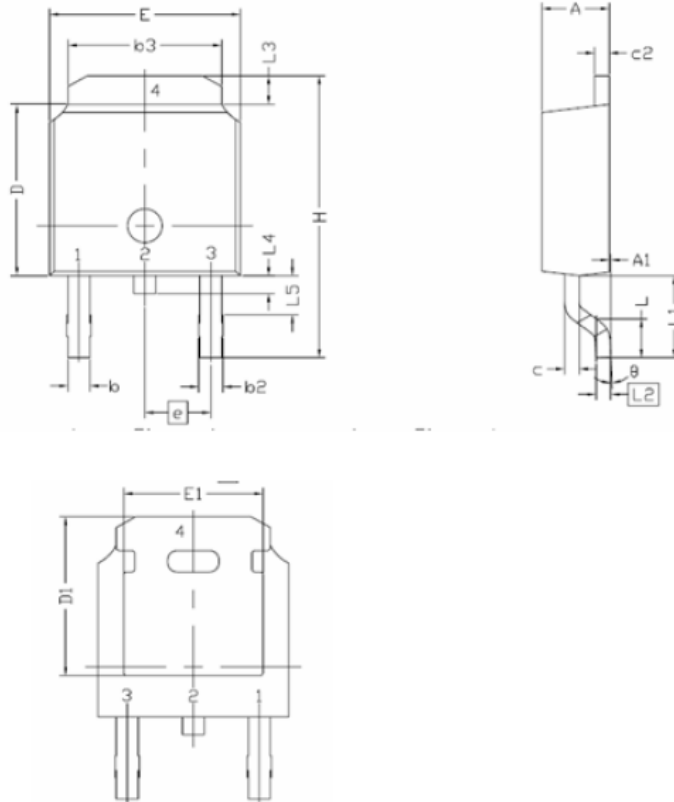


**Fig.11 Transient Thermal Response Curve**

## Package Dimension

### TO-252 (DPAK)

Dimensions are in millimeters, unless otherwise specified




Symbol	Min.	Nom.	Max.
E	6.35	-	6.73
L	1.40	1.52	1.78
L1	2.74 REF		
L2	0.508 BCS		
L3	0.89	-	1.27
L4	-	-	1.02
L5	1.14	-	1.52
D	5.97	6.10	6.22
H	9.40	-	10.41
b	0.64	-	0.89
b2	0.76	-	1.14
b3	4.95	-	5.46
e	2.286 BSC		
A	2.18	-	2.39
A1	-	-	0.13
c	0.46	-	0.61
c2	0.46	-	0.89
D1	5.21	-	-
E1	4.32	-	-
⌀	0.00	-	10.00

Note : Package body size, length and width do not include mold flash, protrusions and gate burrs.

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