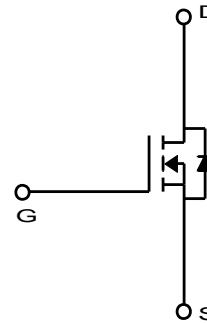
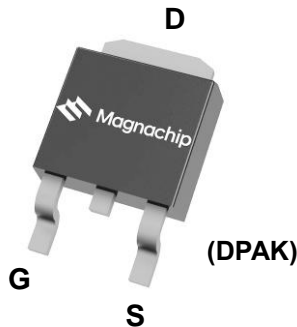


### General Description

The MDD1904 uses advanced Magnachip's MOSFET Technology, which provides high performance in on-state resistance, fast switching performance and excellent quality. MDD1904 is suitable device for DC to DC converter and general purpose applications.

### Features

- $V_{DS} = 100V$
- $I_D = 10.8A @ V_{GS} = 10V$
- $R_{DS(ON) (MAX)} < 140m\Omega @ V_{GS} = 10V$   
 $< 150m\Omega @ V_{GS} = 6.0V$



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

Characteristics		Symbol	Rating	Unit
Drain-Source Voltage		$V_{DSS}$	100	V
Gate-Source Voltage		$V_{GSS}$	±20	V
Continuous Drain Current <sup>(1)</sup>	$T_C=25^\circ C$	$I_D$	10.8	A
	$T_C=70^\circ C$		8.7	
Pulsed Drain Current		$I_{DM}$	25	A
Power Dissipation	$T_C=25^\circ C$	$P_D$	35.8	W
	$T_C=70^\circ C$		22.9	
Single Pulse Avalanche Energy <sup>(2)</sup>		$E_{AS}$	12.5	mJ
Junction and Storage Temperature Range		$T_J, T_{stg}$	-55~150	°C

### Thermal Characteristics

Characteristics	Symbol	Rating	Unit
Thermal Resistance, Junction-to-Ambient <sup>(1)</sup>	$R_{\theta JA}$	52	°C/W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	3.5	

## Ordering Information

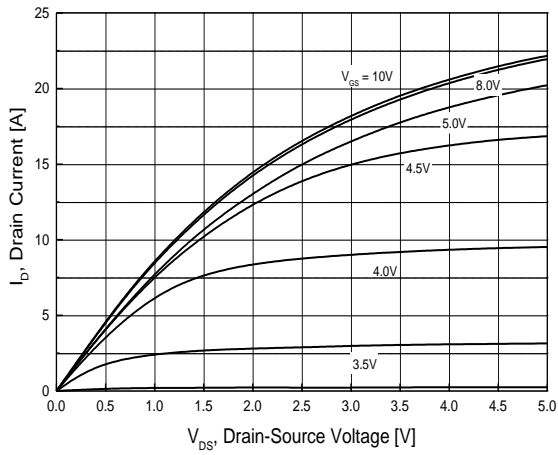
Part Number	Temp. Range	Package	Packing	RoHS Status
MDD1904RH	-55~150°C	DPAK	Tape & Reel	Halogen Free

## Electrical Characteristics (T<sub>J</sub> =25°C)

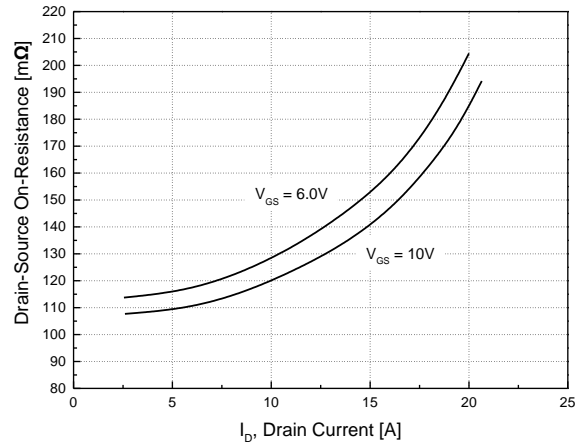
Characteristics	Symbol	Test Condition	Min	Typ	Max	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$I_D = 250\mu A, V_{GS} = 0V$	100	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	1.0	2.0	3.0	
Drain Cut-Off Current	$I_{DSS}$	$V_{DS} = 80V, V_{GS} = 0V$	-	-	1	$\mu A$
Gate Leakage Current	$I_{GSS}$	$V_{GS} = \pm 20V, V_{DS} = 0V$	-	-	$\pm 0.1$	
Drain-Source ON Resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 8.0A$	-	116	140	$m\Omega$
		$V_{GS} = 6.0V, I_D = 8.0A$	-	124	150	
Forward Transconductance	$g_{fs}$	$V_{DS} = 10V, I_D = 8.0A$	-	13.5	-	S
<b>Dynamic Characteristics</b>						
Total Gate Charge	$Q_{g(10V)}$	$V_{DS} = 50.0V, I_D = 8.0A, V_{GS} = 10V$	-	6.7	-	nC
Gate-Source Charge	$Q_{gs}$		-	1.3	-	
Gate-Drain Charge	$Q_{gd}$		-	1.8	-	
Input Capacitance	$C_{iss}$	$V_{DS} = 25.0V, V_{GS} = 0V, f = 1.0MHz$	-	355	-	$\mu F$
Reverse Transfer Capacitance	$C_{riss}$		-	16	-	
Output Capacitance	$C_{oss}$		-	51	-	
Turn-On Delay Time	$t_{d(on)}$	$V_{GS} = 10V, V_{DS} = 50V, I_D = 8.0A, R_G = 3.0\Omega$	-	6.7	-	Ns
Rise Time	$t_r$		-	3.6	-	
Turn-Off Delay Time	$t_{d(off)}$		-	13.7	-	
Fall Time	$t_f$		-	3.3	-	
<b>Drain-Source Body Diode Characteristics</b>						
Source-Drain Diode Forward Voltage	$V_{SD}$	$I_S = 8.0A, V_{GS} = 0V$	-	0.75	1.2	V
Body Diode Reverse Recovery Time	$t_{rr}$	$I_F = 8.0A, di/dt = 100A/\mu s$	-	36.5	-	Ns
Body Diode Reverse Recovery Charge	$Q_{rr}$		-	58.5	-	nC

Note :

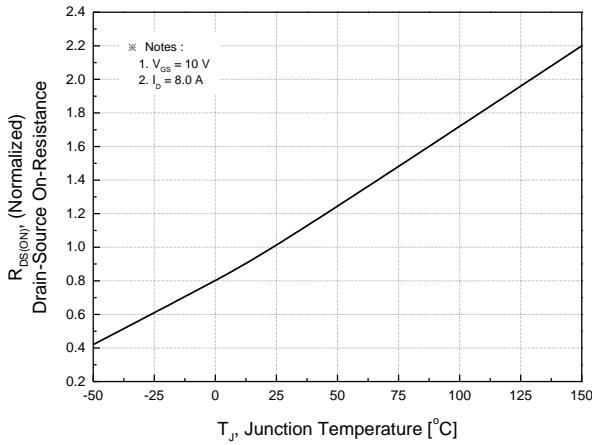
- Surface mounted FR-4 board by JEDEC (jesd51-7)
- $E_{AS}$  is tested at starting  $T_J = 25^\circ C, L = 1.0mH, I_{AS} = 5.0A, V_{DD} = 50V, V_{GS} = 10V$



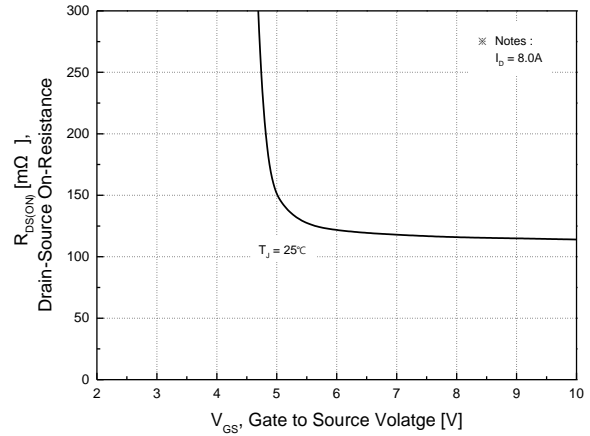
**Fig.1 On-Region Characteristics**



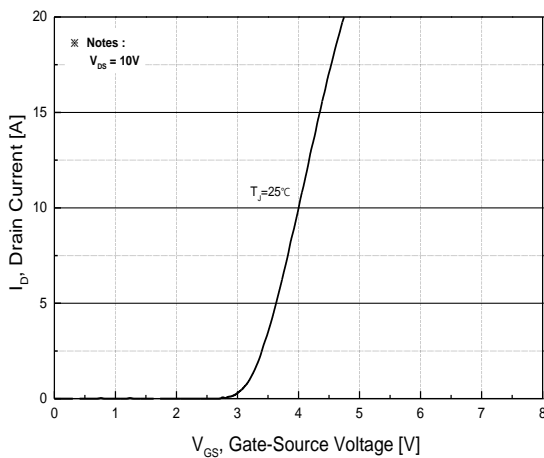
**Fig.2 On-Resistance Variation with Drain Current and Gate Voltage**



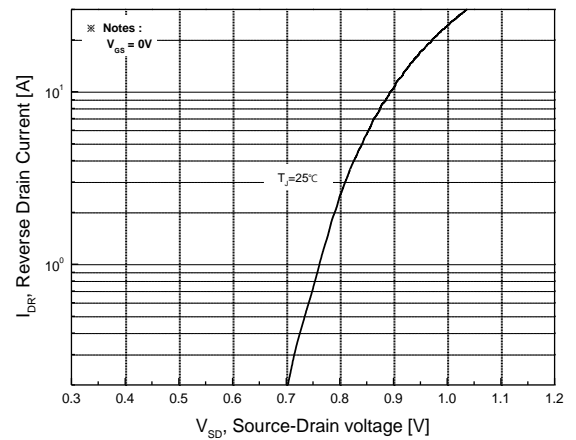
**Fig.3 On-Resistance Variation with Temperature**



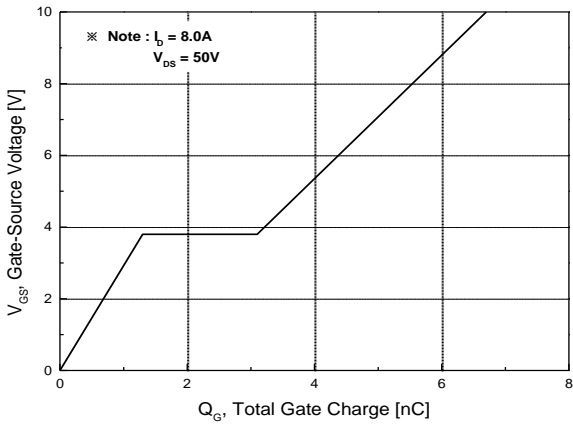
**Fig.4 On-Resistance Variation with Gate to Source Voltage**



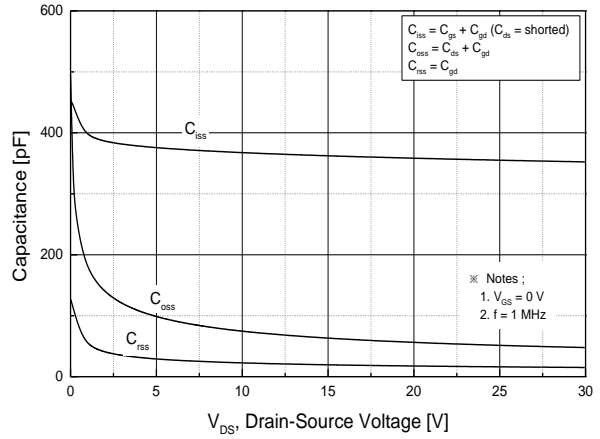
**Fig.5 Transfer Characteristics**



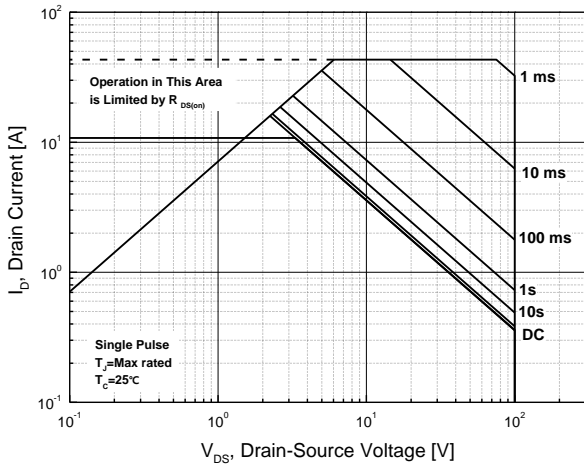
**Fig.6 Body Diode Forward Voltage Variation with Source Current and Temperature**



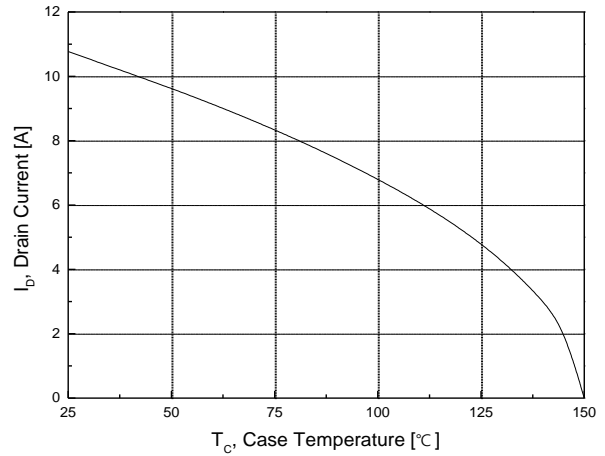
**Fig.7 Gate Charge Characteristics**



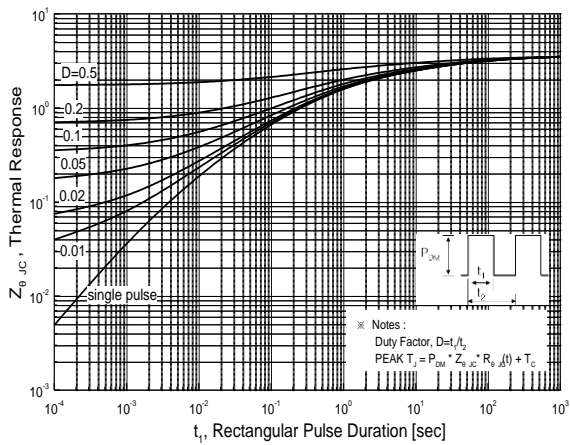
**Fig.8 Capacitance Characteristics**



**Fig.9 Maximum Safe Operating Area**



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

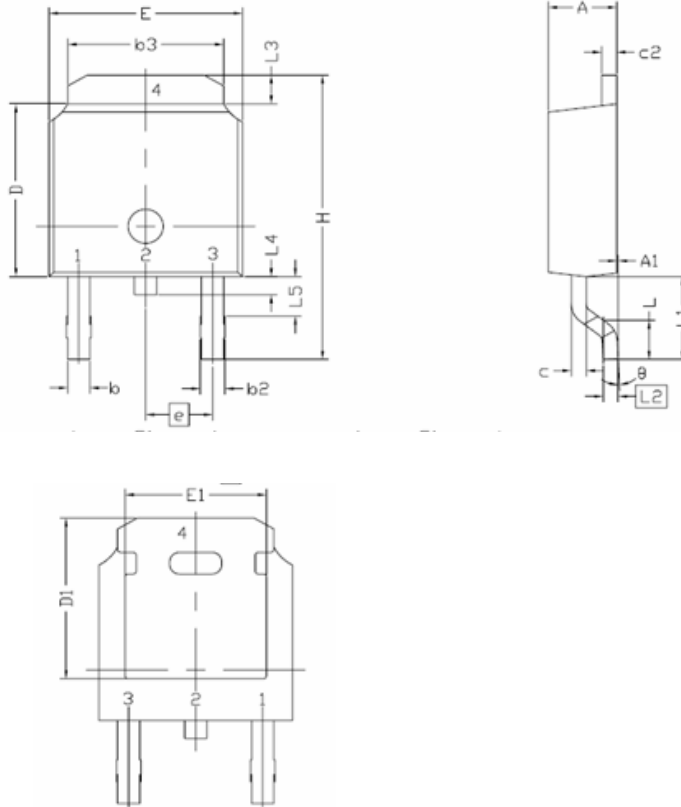


**Fig.11 Transient Thermal Response Curve**

## 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	-	-
ϕ	0.00	-	10.00

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

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