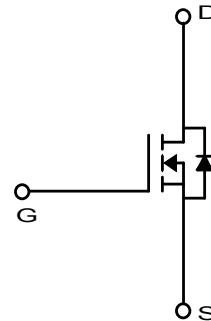
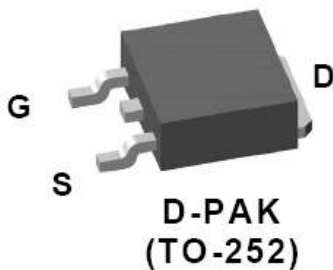


General Description

The MDD1504 uses advanced MagnaChip's MOSFET Technology, which provides high performance in on-state resistance, fast switching performance and excellent quality. MDD1504 is suitable device for DC to DC converter and general purpose applications.

Features

- $V_{DS} = 30V$
- $I_D = 31.5A$ @ $V_{GS} = 10V$
- $R_{DS(ON) (MAX)} < 12.7m\Omega$ @ $V_{GS} = 10V$
- $< 18.8m\Omega$ @ $V_{GS} = 4.5V$
- 100% UIL Tested
- 100% Rg Tested



Absolute Maximum Ratings (Ta = 25°C)

Characteristics		Symbol	Rating	Unit
Drain-Source Voltage		V_{DSS}	30	V
Gate-Source Voltage		V_{GSS}	±20	V
Continuous Drain Current ⁽¹⁾	$T_C=25^{\circ}C$	I_D	31.5	A
	$T_C=70^{\circ}C$		25.1	
	$T_A=25^{\circ}C$		17.2 ⁽³⁾	
	$T_A=70^{\circ}C$		13.8 ⁽³⁾	
Pulsed Drain Current		I_{DM}	100	A
Power Dissipation	$T_C=25^{\circ}C$	P_D	20.8	W
	$T_C=70^{\circ}C$		13.3	
	$T_A=25^{\circ}C$		6.2 ⁽³⁾	
	$T_A=70^{\circ}C$		4.0 ⁽³⁾	
Single Pulse Avalanche Energy ⁽²⁾		E_{AS}	23	mJ
Junction and Storage Temperature Range		T_J, T_{stg}	-55~150	°C

Thermal Characteristics

Characteristics	Symbol	Rating	Unit
Thermal Resistance, Junction-to-Ambient ⁽¹⁾	$R_{\theta JA}$	20.0	°C/W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	6.0	

Ordering Information

Part Number	Temp. Range	Package	Packing	Quantity	Rohs Status
MDD1504RH	-55~150°C	D-PAK	Tape & Reel	3000 units	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	30	-	-	V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250μA	1.3	1.9	2.7	
Drain Cut-Off Current	I _{DSS}	V _{DS} = 30V, V _{GS} = 0V T _J =55°C	-	-	1 5	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 = 13A T _J =125°C	-	11.0 16.0	12.7 18.4	mΩ
		V _{GS} = 4.5V, I _D = 11A	-	15.7	18.8	
Forward Transconductance	g _{fs}	V _{DS} = 5V, I _D = 10A	-	27	-	S
Dynamic Characteristics						
Total Gate Charge	Q _{g(10V)}	V _{DS} = 15.0V, I _D = 13A, V _{GS} = 10V	7.3	9.7	12.1	nC
Total Gate Charge	Q _{g(4.5V)}		3.3	4.5	5.6	
Gate-Source Charge	Q _{gs}		-	1.8	-	
Gate-Drain Charge	Q _{gd}		-	3.3	-	
Input Capacitance	C _{iss}	V _{DS} = 15.0V, V _{GS} = 0V, f = 1.0MHz	435	580	725	pF
Reverse Transfer Capacitance	C _{rss}		43	57	71	
Output Capacitance	C _{oss}		94	126	158	
Turn-On Delay Time	t _{d(on)}	V _{GS} = 10V, V _{DS} = 15.0V, I _D = 13A, R _G = 3.0Ω	-	6.7	-	ns
Rise Time	t _r		-	11.7	-	
Turn-Off Delay Time	t _{d(off)}		-	13.5	-	
Fall Time	t _f		-	7.0	-	
Gate Resistance	R _g	f=1 MHz	-	6.6	8.5	Ω
Drain-Source Body Diode Characteristics						
Source-Drain Diode Forward Voltage	V _{SD}	I _S = 13A, V _{GS} = 0V	-	0.87	1.1	V
Body Diode Reverse Recovery Time	t _{rr}	I _F = 13A, di/dt = 100A/μs	-	17.5	26.3	ns
Body Diode Reverse Recovery Charge	Q _{rr}		-	9.8	14.7	nC

Note :

1. Surface mounted FR-4 board by JEDEC (jesd51-7)
2. E_{AS} is tested at starting T_J = 25°C, L = 0.1mH, I_{AS} = 12.0A, V_{DD} = 27V, V_{GS} = 10V
3. T < 10sec.

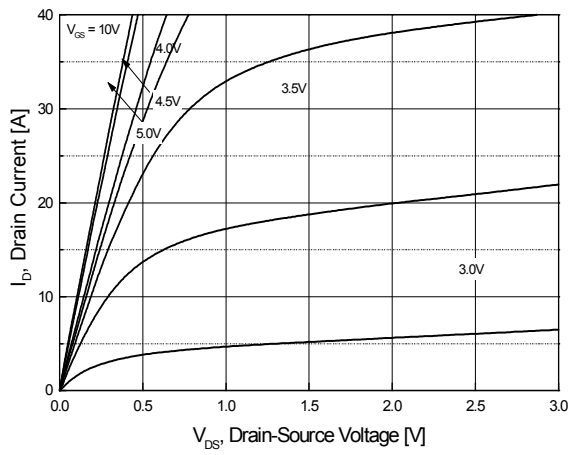


Fig.1 On-Region Characteristics

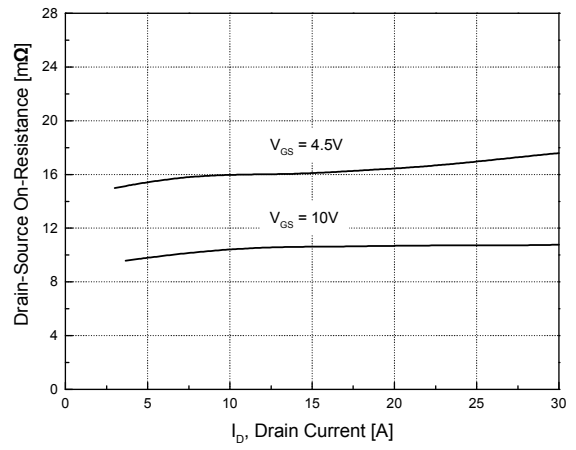


Fig.2 On-Resistance Variation with Drain Current and Gate Voltage

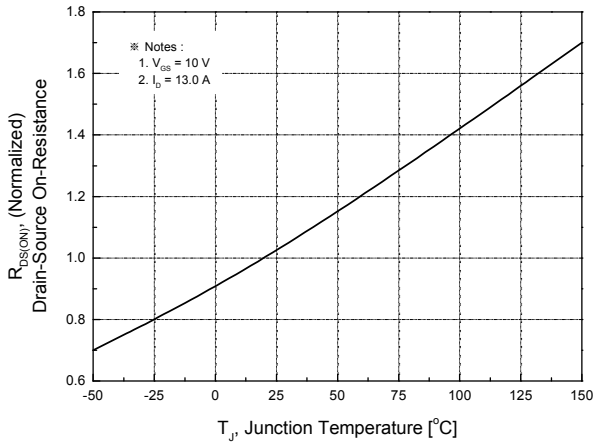


Fig.3 On-Resistance Variation with Temperature

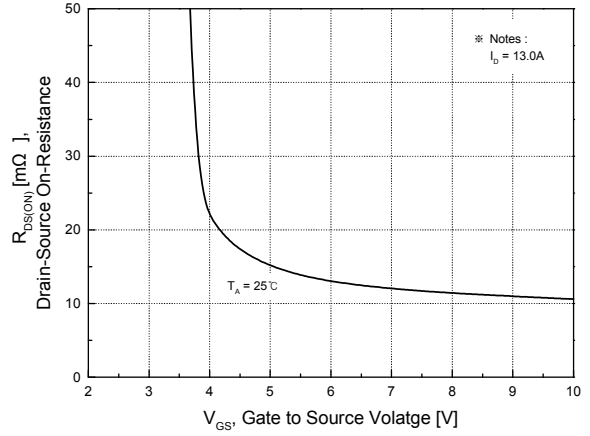


Fig.4 On-Resistance Variation with Gate to Source Voltage

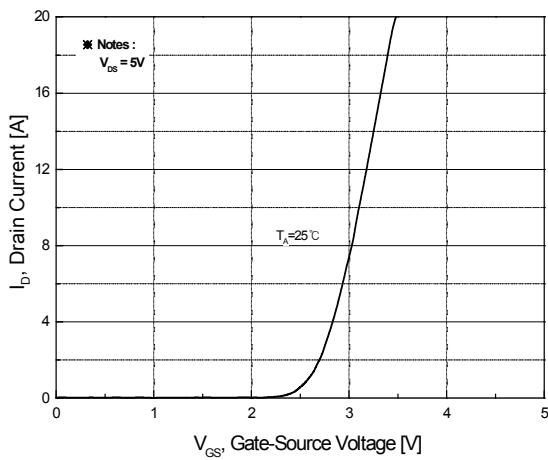


Fig.5 Transfer Characteristics

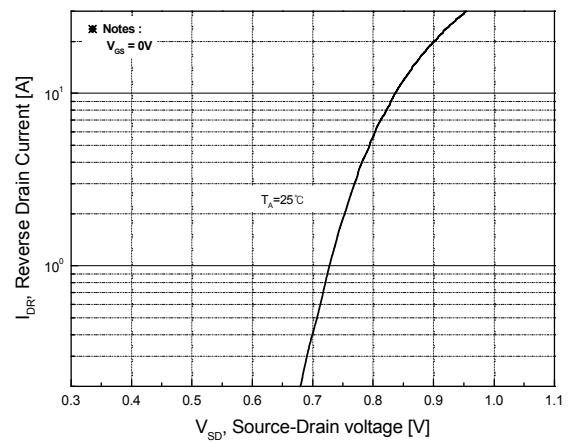
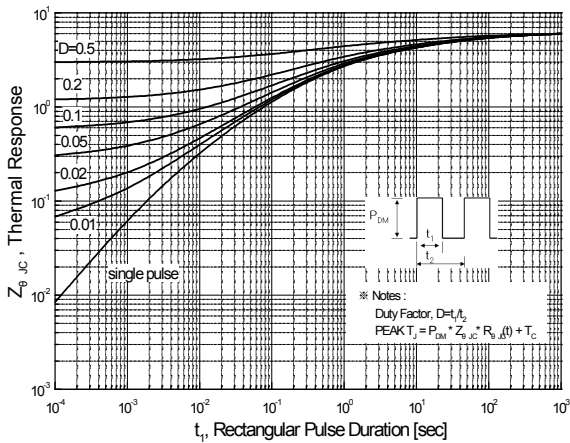
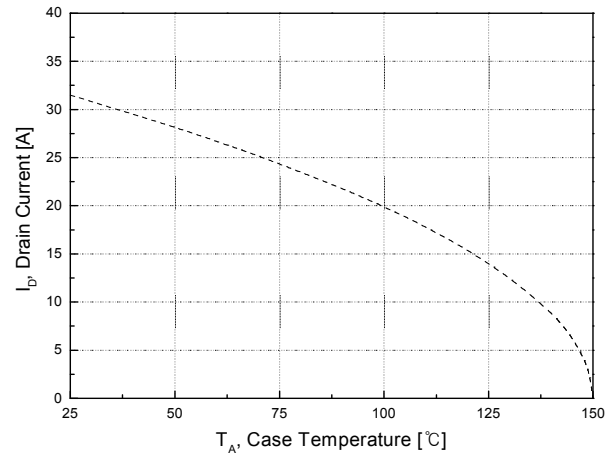
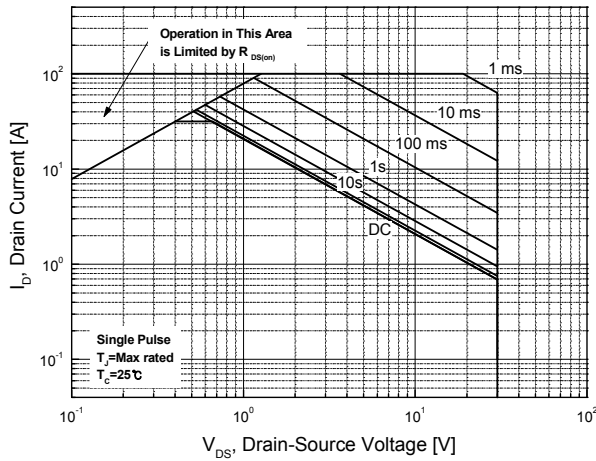
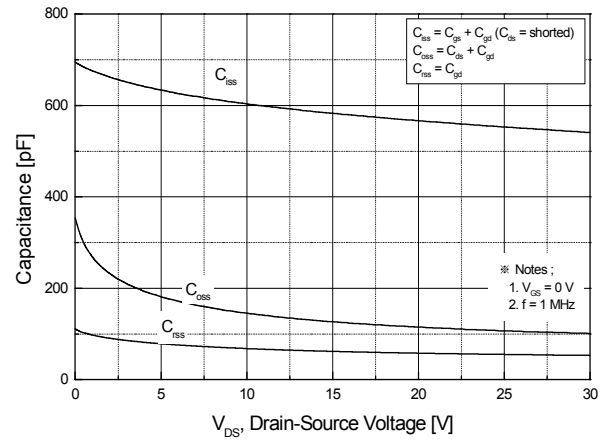
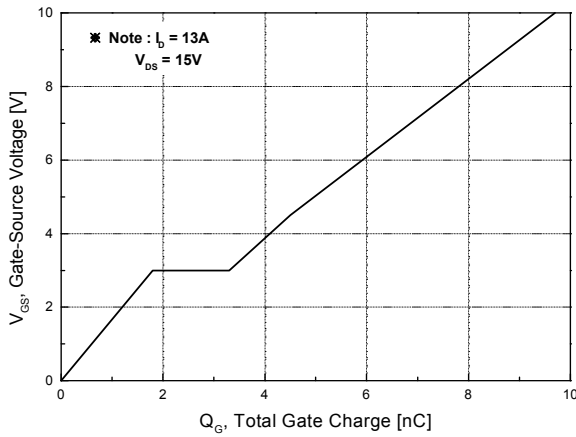


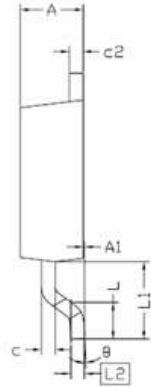
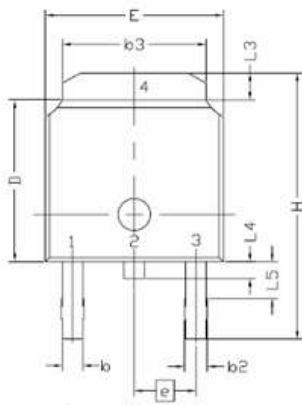
Fig.6 Body Diode Forward Voltage Variation with Source Current and Temperature



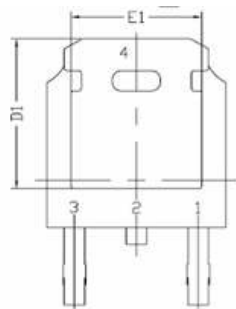
Package Dimension

D-PAK (TO-252)

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	-	-
Ø	0,00	-	10,00



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