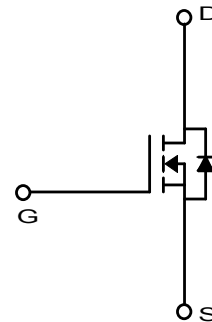
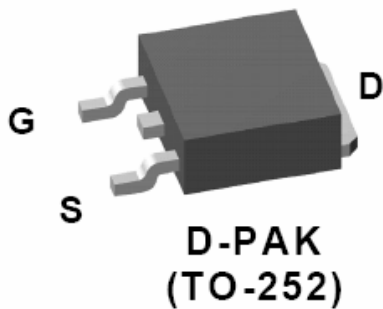


General Description

The MDD1654 uses advanced MagnaChip's MOSFET Technology, which provides high performance in on-state resistance, fast switching performance and excellent quality. MDD1654 is suitable device for PWM, Load Switching and general purpose applications.

Features

- $V_{DS} = 30V$
- $I_D = 55A$ @ $V_{GS} = 10V$
- $R_{DS(ON)} < 6.0m\Omega$ @ $V_{GS} = 10V$
 $< 9.5m\Omega$ @ $V_{GS} = 4.5V$



Absolute Maximum Ratings (Tc = 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	55	A
	$T_C=100^\circ C$		34	A
Pulsed Drain Current		I_{DM}	150	A
Power Dissipation	$T_C=25^\circ C$	P_D	29	W
	$T_C=100^\circ C$		11	
Single Pulse Avalanche Energy ⁽²⁾		E_{AS}	45	mJ
Junction and Storage Temperature Range		T_J, T_{stg}	-55~150	°C

Thermal Characteristics

Characteristics	Symbol	Rating	Unit
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	42	°C/W
Thermal Resistance, Junction-to-Case ⁽¹⁾	$R_{\theta JC}$	4.3	

Ordering Information

Part Number	Temp. Range	Package	Packing	Rohs Status
MDD1654RP	-55~150°C	D-PAK	Tape & Reel	Pb Free
MDD1654RH	-55~150°C	D-PAK	Tape & Reel	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	30	-	-	V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250μA	1.0	1.8	3.0	
Drain Cut-Off Current	I _{DSS}	V _{DS} = 24V, 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 = 30A	-	5.0	6.0	mΩ
		V _{GS} = 4.5V, I _D = 20A	-	8.0	9.5	
Forward Transconductance	g _{fs}	V _{DS} = 5V, I _D = 10A	-	49	-	S
Dynamic Characteristics						
Total Gate Charge	Q _{g(10V)}	V _{DS} = 12.5V, I _D = 30A, V _{GS} = 10V	-	28	-	nC
Total Gate Charge	Q _{g(4.5V)}		-	15.6	-	
Gate-Source Charge	Q _{gs}		-	4.1	-	
Gate-Drain Charge	Q _{gd}		-	5.6	-	
Input Capacitance	C _{iss}	V _{DS} = 12.5V, V _{GS} = 0V, f = 1.0MHz	-	1200	-	pF
Reverse Transfer Capacitance	C _{rss}		-	150	-	
Output Capacitance	C _{oss}		-	278	-	
Turn-On Delay Time	t _{d(on)}	V _{GS} = 10V, V _{DS} = 12.5V, R _L = 0.6Ω, R _G = 3Ω	-	7.4	-	ns
Rise Time	t _r		-	21.8	-	
Turn-Off Delay Time	t _{d(off)}		-	21.4	-	
Fall Time	t _f		-	14.5	-	
Drain-Source Body Diode Characteristics						
Source-Drain Diode Forward Voltage	V _{SD}	I _S = 1A, V _{GS} = 0V	-	0.71	-	V
Body Diode Reverse Recovery Time	t _{rr}	I _F = 20A, dI/dt = 100A/μs	-	28	-	ns
Body Diode Reverse Recovery Charge	Q _{rr}		-	17	-	nC

Note :

1. Surface mounted RF4 board with 2oz. Copper.
2. Starting T_J = 25°C, L = 1mH, I_{AS} = 10A, V_{DD} = 15V, V_{GS} = 10V.

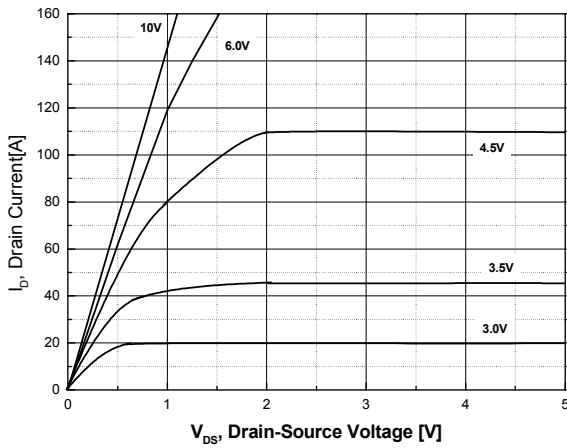


Fig.1 On-Region Characteristics

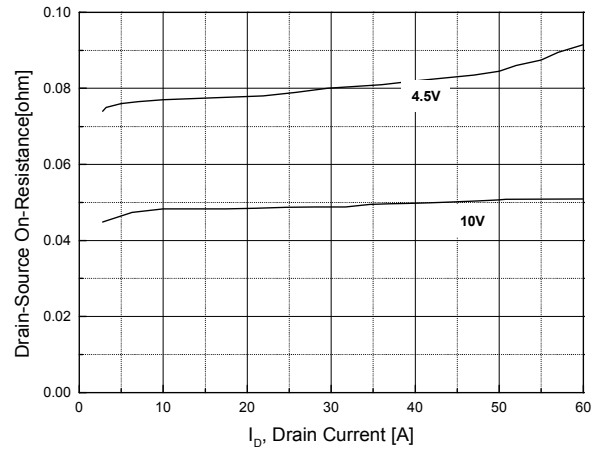


Fig.2 On-Resistance Variation with Drain Current and Gate Voltage

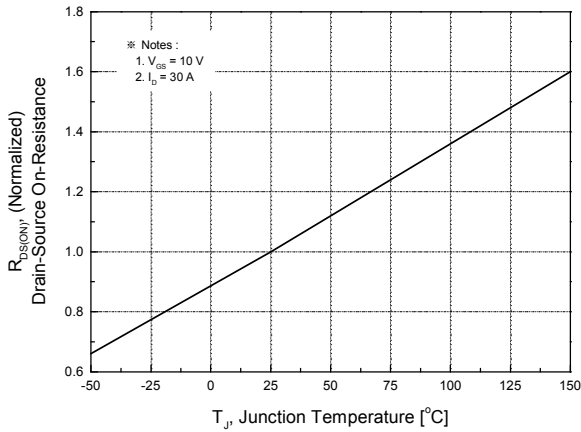


Fig.3 On-Resistance Variation with Temperature

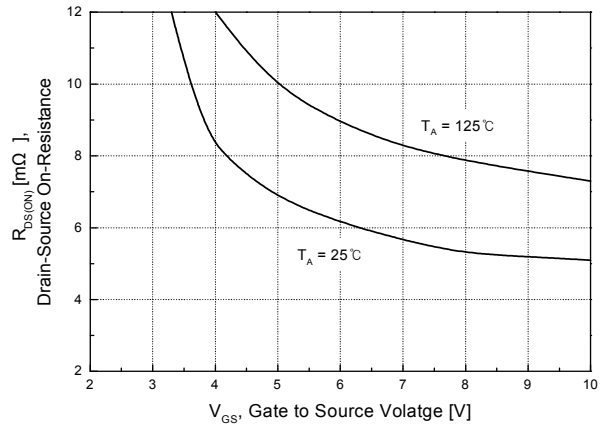


Fig.4 On-Resistance Variation with Gate to Source Voltage

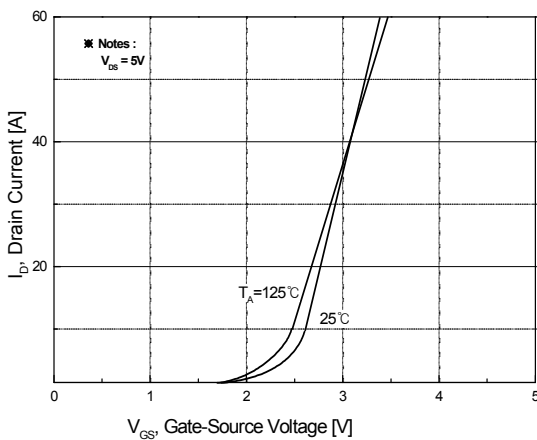


Fig.5 Transfer Characteristics

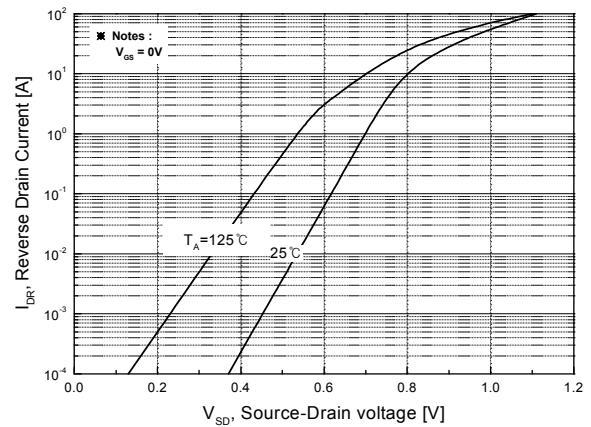
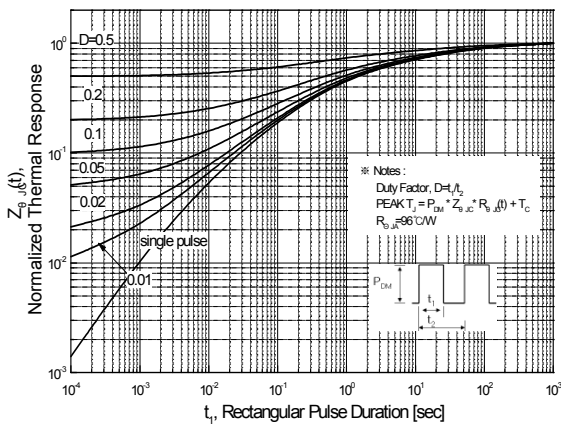
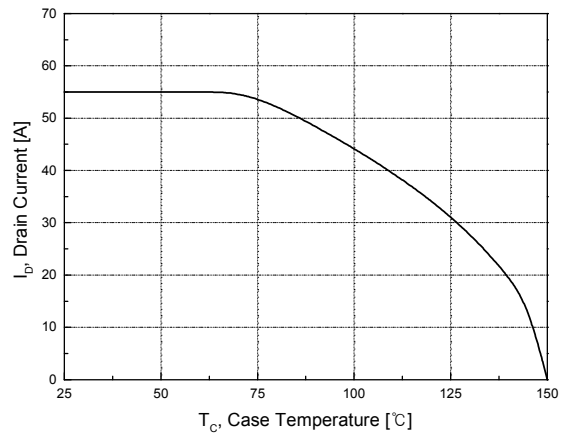
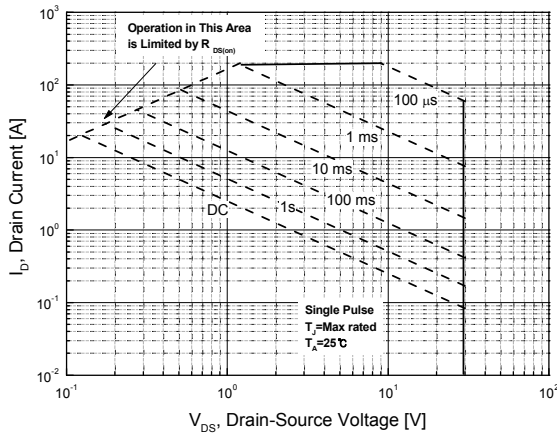
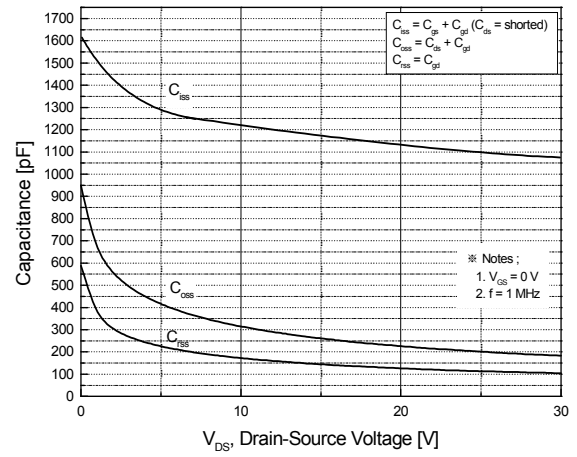
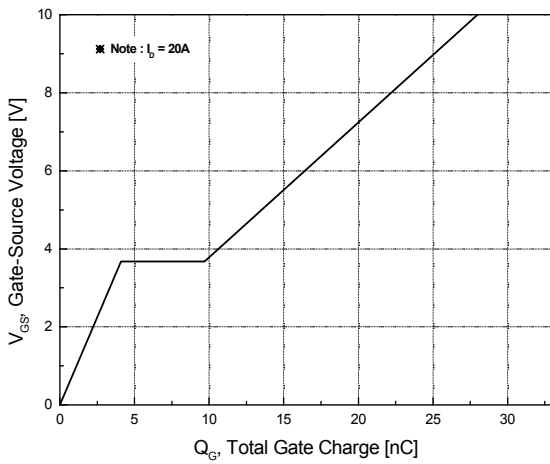


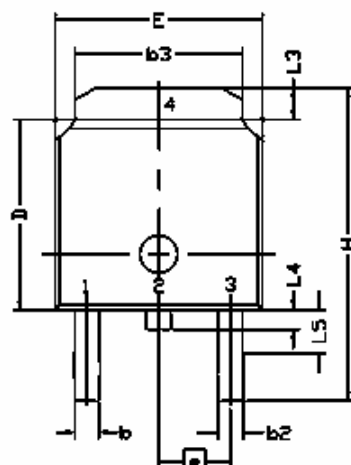
Fig.6 Body Diode Forward Voltage Variation with Source Current and Temperature



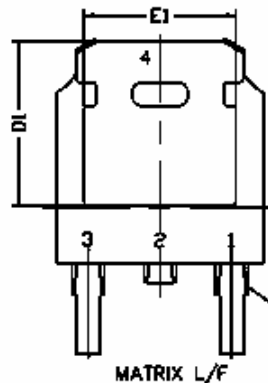
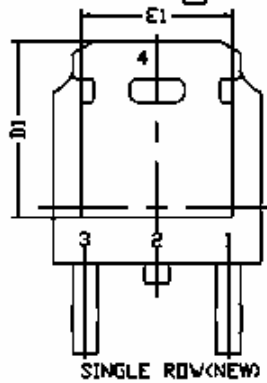
Package Dimension

D-PAK (TO-252)

Dimensions are in millimeters, unless otherwise specified



SYMBOL	DIMENSIONAL REQS		
	MIN	NOM	MAX
E	6.40	6.60	6.731
L	1.40	1.52	1.77
L1	2.743 REF		
L2	0.508 BSC		
L3	0.89	--	1.27
L4	0.64	--	1.01
L5	--	--	--
D	6.00	6.10	6.223
H	9.40	10.00	10.40
b	0.64	0.76	0.88
b2	0.77	0.84	1.14
b3	5.21	5.34	5.46
e	2.286 BSC		
A	2.20	2.30	2.39
A1	0	--	0.127
c	0.45	0.50	0.60
c2	0.45	0.50	0.58
D1	5.30	--	--
E1	4.40	--	--
θ	0°	--	10°



COPPER
EXPOSITION
AREA

Notes:

1. All Dimensions Are In mm.
2. Package Body Steps Exclude Mold Flash, Protrusion Or Gate Bump. Mold Flash, Protrusion Or Gate Bump Shall Not Exceed 0.10 mm Per Side.
3. Package Body Steps Determined At The Outmost Extremity Of The Plastic Body Exclusive Of Mold Flash. Gate Bump And Interlead Flash, Not Including Any Minutiae Between The Top And Bottom Of The Plastic Body.
4. The Package Top May Be Smaller Than The Package Bottom.
5. Dimension "θ" Does Not Include Damber Protrusion. Allowable Damber Protrusion Shall Be 0.10 mm Total In Excess Of "θ" Dimension At Maximum Mated Condition. The Damber Cannot Be Located On The Lower Radius Of The Foot.

Worldwide Sales Support Locations

U.S.A

Sunnyvale Office

787 N. Mary Ave. Sunnyvale
CA 94085 U.S.A
Tel : 1-408-636-5200
Fax : 1-408-213-2450
E-Mail : americasales@magnachip.com

Chicago Office

2300 Barrington Road, Suite 330
Hoffman Estates, IL 60195 U.S.A
Tel : 1-847-882-0951
Fax : 1-847-882-0998

U.K

Knyvett House The Causeway,
Staines Middx, TW18 3BA, U.K.
Tel : +44 (0) 1784-898-8000
Fax : +44 (0) 1784-895-115
E-Mail : europesales@magnachip.com

Japan

Tokyo Office

Shinbashi 2-chome MT bldg
4F 2-5-5 Shinbashi, Minato-ku
Tokyo, 105-0004 Japan
Tel : 81-3-3595-0632
Fax : 81-3-3595-0671
E-Mail : japansales@magnachip.com

Osaka Office

3F, Shin-Osaka MT-2 Bldg
3-5-36 Miyahara Yodogawa-Ku
Osaka, 532-0003 Japan
Tel : 81-6-6394-8224
Fax : 81-6-6394-8282
E-Mail : osakasales@magnachip.com

Taiwan R.O.C

2F, No.61, Chowize Street, Nei Hu
Taipei, 114 Taiwan R.O.C
Tel : 886-2-2657-7898
Fax : 886-2-2657-8751
E-Mail : taiwansales@magnachip.com

China

Hong Kong Office

Office 03, 42/F, Office Tower Convention Plaza
1 Harbour Road, Wanchai, Hong Kong
Tel : 852-2828-9700
Fax : 852-2802-8183
E-Mail : chinasales@magnachip.com

Shenzhen Office

Room 1803, 18/F
International Chamber of Commerce Tower
Fuhua 3Road, Futian District
ShenZhen, China
Tel : 86-755-8831-5561
Fax : 86-755-8831-5565

Shanghai Office

Ste 1902, 1 Huaihai Rd. (C) 20021
Shanghai, China
Tel : 86-21-6373-5181
Fax : 86-21-6373-6640

Korea

891, Daechi-Dong, Kangnam-Gu
Seoul, 135-738 Korea
Tel : 82-2-6903-3451
Fax : 82-2-6903-3668 ~9
Email : koreasales@magnachip.com

DISCLAIMER:

The Products are not designed for use in hostile environments, including, without limitation, aircraft, nuclear power generation, medical appliances, and devices or systems in which malfunction of any Product can reasonably be expected to result in a personal injury. Seller's customers using or selling Seller's products for use in such applications do so at their own risk and agree to fully defend and indemnify Seller.

MagnaChip reserves the right to change the specifications and circuitry without notice at any time. MagnaChip does not consider responsibility for use of any circuitry other than circuitry entirely included in a MagnaChip product. **MagnaChip** is a registered trademark of MagnaChip Semiconductor Ltd.