

General Description

The MDF3752 uses advanced MagnaChip's Trench MOSFET Technology to provided high performance in on-state resistance, switching performance and reliability.

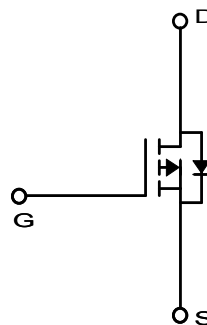
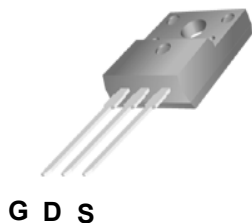
Low $R_{DS(ON)}$, Low Gate Charge can be offering superior benefit in the application.

Features

- $V_{DS} = -40V$
- $I_D = -36.5A$ @ $V_{GS} = -10V$
- $R_{DS(ON)} < 17m\Omega$ @ $V_{GS} = -10V$
- $R_{DS(ON)} < 25m\Omega$ @ $V_{GS} = -4.5V$

Applications

- Inverters
- General purpose applications



Absolute Maximum Ratings ($T_C = 25^\circ$)

Characteristics		Symbol	Rating	Unit
Drain-Source Voltage		V_{DSS}	-40	V
Gate-Source Voltage		V_{GSS}	± 20	V
Continuous Drain Current (Note 1)	$T_C = 25^\circ C$	I_D	-36.5	A
	$T_C = 100^\circ C$		-23.1	A
Pulsed Drain Current		I_{DM}	-90	A
Power Dissipation	$T_C = 25^\circ C$	P_D	35.7	W
	$T_C = 100^\circ C$		14.3	
Single Pulse Avalanche Energy (Note 2)		E_{AS}	128	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	$R_{\theta JA}$	62.5	$^\circ C/W$
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	3.5	

Ordering Information

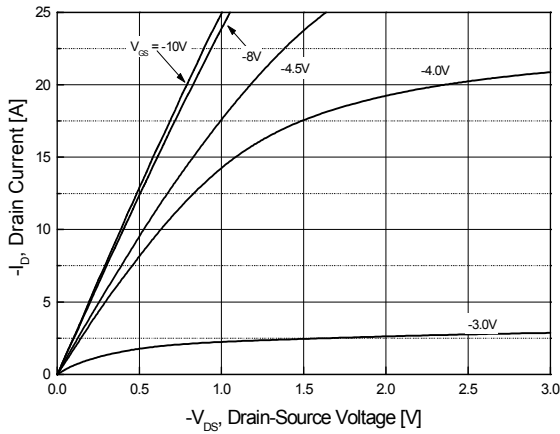
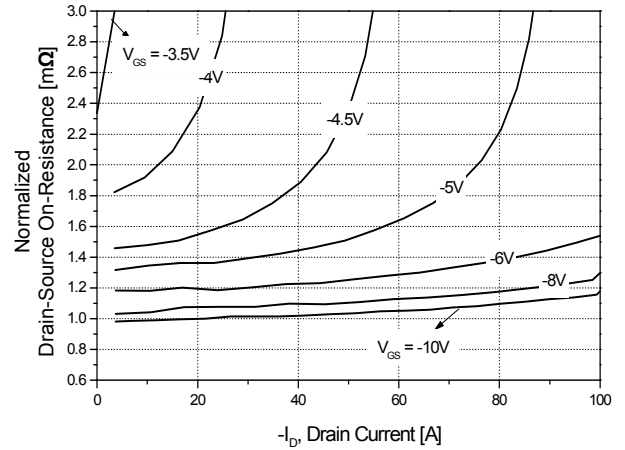
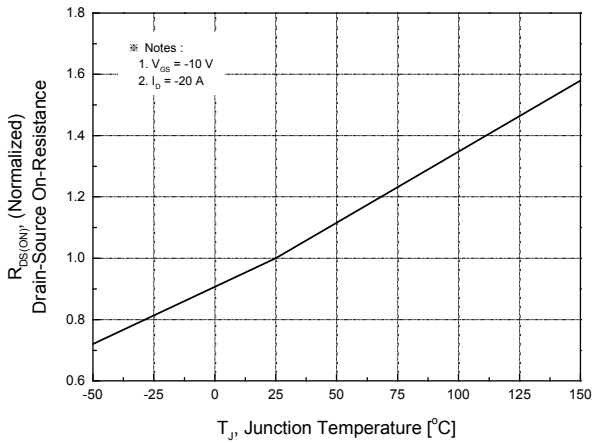
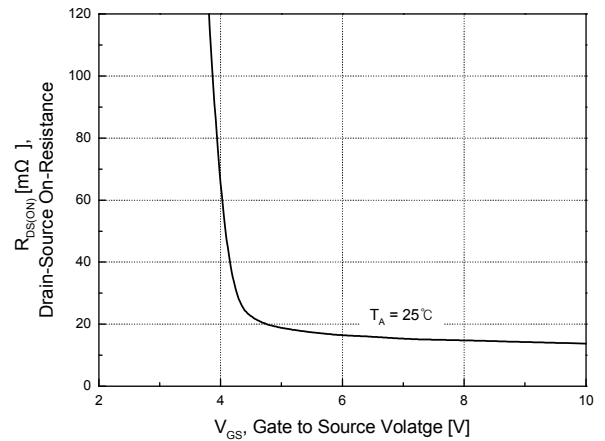
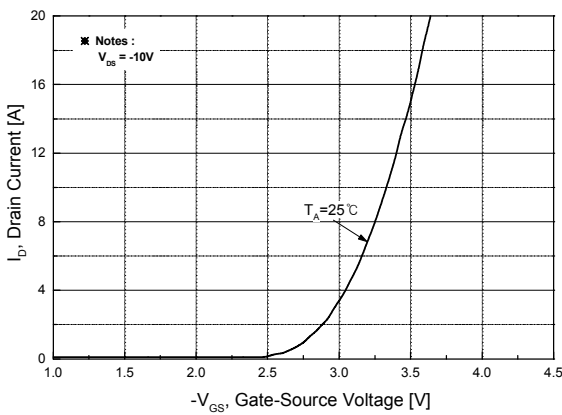
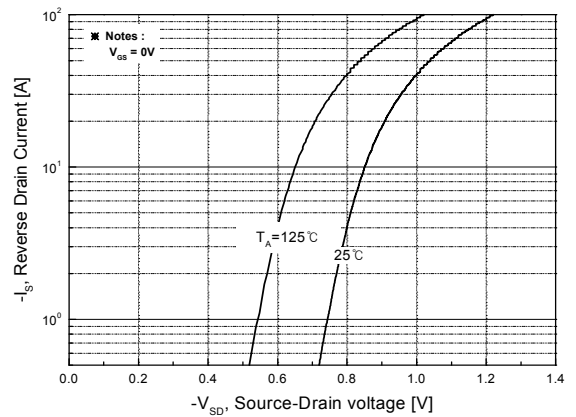
Part Number	Temp. Range	Package	Packing	RoHS Status
MDF3752TH	-55~150°C	TO-220F	Tube	Halogen Free

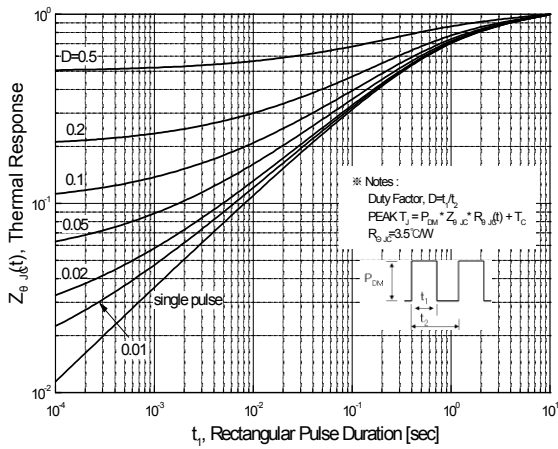
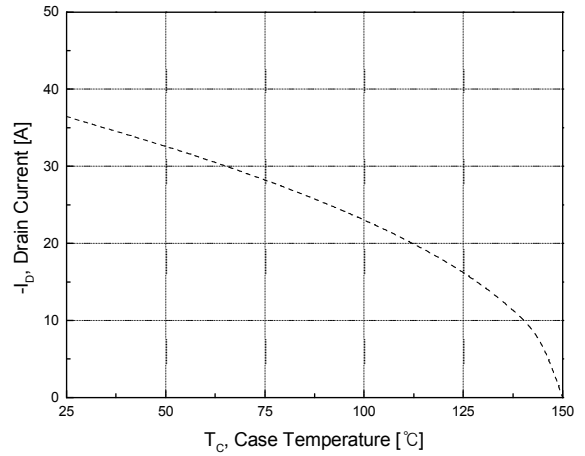
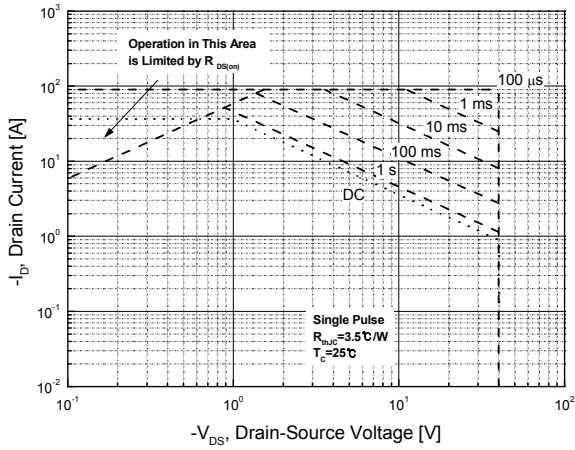
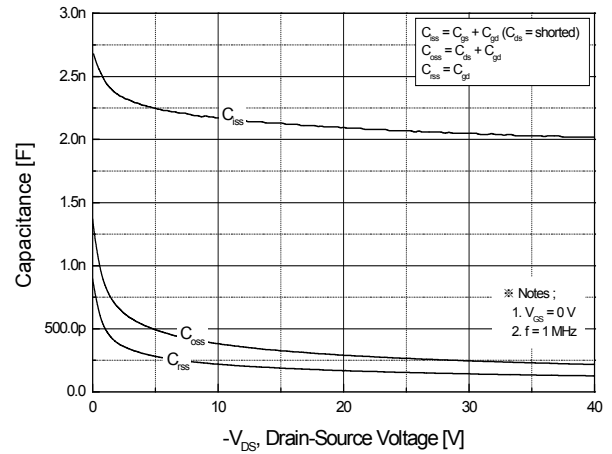
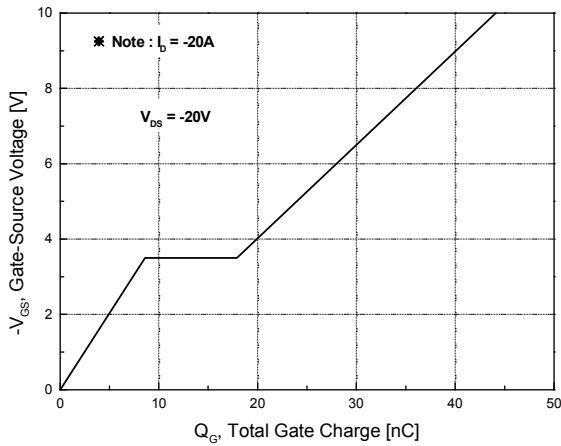
Electrical Characteristics (T_J =25°C unless otherwise noted)

Characteristics	Symbol	Test Condition	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	I _D = -250μA, V _{GS} = 0V	-40	-	-	V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = -250μA	-1.0	-2.0	-3.0	
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = -32V, 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 = -20A	-	13	17	mΩ
		V _{GS} = -4.5V, I _D = -10A		19	25	
Forward Transconductance	g _{FS}	V _{DS} = -10V, I _D = -20A		40	-	S
Dynamic Characteristics						
Total Gate Charge	Q _g	V _{DD} = -20V, I _D = -20A, V _{GS} = -10V	-	44.1	-	nC
Gate-Source Charge	Q _{gs}		-	8.6	-	
Gate-Drain Charge	Q _{gd}		-	9.3	-	
Input Capacitance	C _{iss}	V _{DS} = -20V, V _{GS} = 0V, f = 1.0MHz	-	2088	-	pF
Reverse Transfer Capacitance	C _{rss}		-	168	-	
Output Capacitance	C _{oss}		-	290	-	
Turn-On Delay Time	t _{d(on)}	V _{GS} = -10V ,V _{DD} = -20V, I _D = -1A, R _{GEN} =6.0Ω	-	17.6	-	ns
Turn-On Rise Time	t _r		-	17.8	-	
Turn-Off Delay Time	t _{d(off)}		-	59.0	-	
Turn-Off Fall Time	t _f		-	19.8	-	
Drain-Source Body Diode Characteristics						
Source-Drain Diode Forward Voltage	V _{SD}	I _S = -20A, V _{GS} = 0V	-	-	1.2	V
Reverse Recovery Time	trr	IS = -20A, di/dt=100A/us	-	40	-	ns
Reverse Recovery Charge	Qrr		-	40	-	nC

Note :

1. P_D is based on T_{J(MAX)} = 150°C, P_D(T_C = 25°C) is based on R_{θJC}.
2. Starting T_J = 25°C, L = 1mH, I_{AS} = -16A V_{DD} = -20V, V_{GS} = -10V

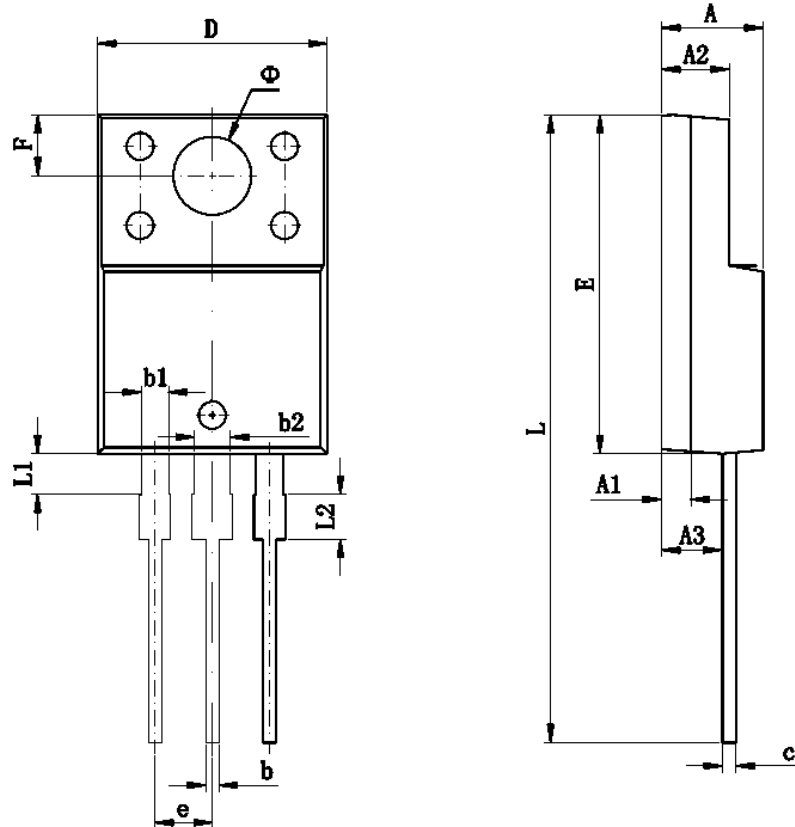

Fig.1 On-Region Characteristics

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



Physical Dimensions

3 Leads, TO-220F

Dimensions are in millimeters unless otherwise specified



Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Min	Max	Min	Max
A	4.300	4.700	0.169	0.185
A1	1.300 REF		0.051 REF	
A2	2.800	3.200	0.110	0.126
A3	2.500	2.900	0.098	0.114
b	0.500	0.750	0.020	0.030
b1	1.100	1.350	0.043	0.053
b2	1.500	1.750	0.059	0.069
c	0.500	0.750	0.020	0.030
D	9.960	10.360	0.392	0.408
E	14.800	15.200	0.583	0.598
e	2.540 TYP		0.100 TYP	
F	2.700 REF		0.106 REF	
Φ	3.500 REF		0.138 REF	
h	0.000	0.300	0.000	0.012
L	28.000	28.400	1.102	1.118
L1	1.700	1.900	0.067	0.075
L2	1.900	2.100	0.075	0.083

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

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