

General Description

The MDS3754A uses advanced Magnachip's Trench MOSFET Technology to provide high performance in on-state resistance, switching performance and reliability.

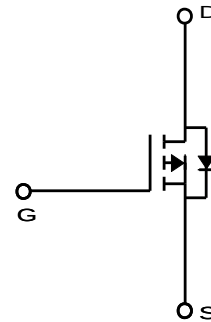
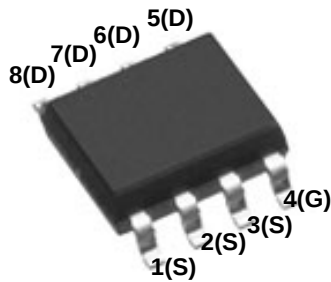
Low $R_{DS(ON)}$, Low Gate Charge can be offering superior benefit in the application.

Features

- $V_{DS} = -40V$
- $I_D = -6.0$ @ $V_{GS} = -10V$
- $R_{DS(ON)} < 45m\Omega$ @ $V_{GS} = -10V$
- $< 60m\Omega$ @ $V_{GS} = -4.5V$

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)	I_D	-6.0	A
Pulsed Drain Current	I_{DM}	-50	A
Power Dissipation	P_D	2.5	W
Single Pulse Avalanche Energy (Note 2)	E_{AS}	32	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 (Note 1)	$R_{\theta JA}$	50	$^\circ C/W$
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	25	

Ordering Information

Part Number	Temp. Range	Package	Packing	RoHS Status
MDS3754ARH	-55~150°C	SIOC-8	Tape & Reel	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 = -6A	-	34	45	mΩ
		V _{GS} = -4.5V, I _D = -4A		46	60	
Forward Transconductance	g _{FS}	V _{DS} = -10V, I _D = -6A		12	-	S
Dynamic Characteristics						
Total Gate Charge	Q _g	V _{DS} = -28V, I _D = -4.8A, V _{GS} = -10V	-	15.6	-	nC
Gate-Source Charge	Q _{gs}		-	2.4	-	
Gate-Drain Charge	Q _{gd}		-	3.8	-	
Input Capacitance	C _{iss}	V _{DS} = -25V, V _{GS} = 0V, f = 1.0MHz	-	660	-	pF
Reverse Transfer Capacitance	C _{rss}		-	57	-	
Output Capacitance	C _{oss}		-	100	-	
Turn-On Delay Time	t _{d(on)}	V _{GS} = -10V ,V _{DS} = -20V, I _D = 1A, R _{GEN} = 3.3Ω	-	14.7	-	ns
Turn-On Rise Time	t _r		-	7.2	-	
Turn-Off Delay Time	t _{d(off)}		-	32.1	-	
Turn-Off Fall Time	t _f		-	12.5	-	
Drain-Source Body Diode Characteristics						
Source-Drain Diode Forward Voltage	V _{SD}	I _S = -6A, V _{GS} = 0V	-	-	1.2	V
Reverse Recovery Time	trr	I _S = -4.8A, di/dt=100A/us	-	27.2	-	ns
Reverse Recovery Charge	Qrr		-	19.6	-	nC

Note :

1. Surface mounted RF4 board with 2oz. Copper.
2. Starting T_J=25°C, L=1mH, I_{AS}=-8A V_{DD}=-20V, V_{GS}=-10V

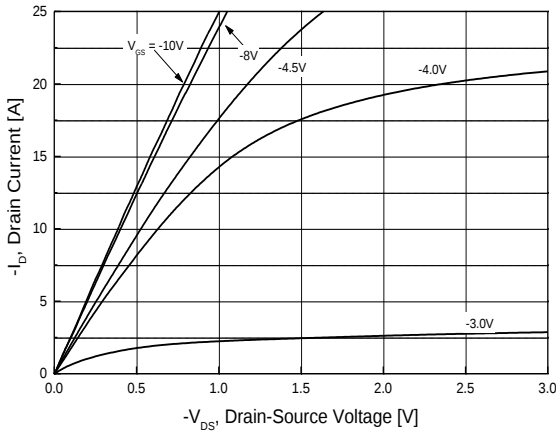


Fig.1 On-Region Characteristics

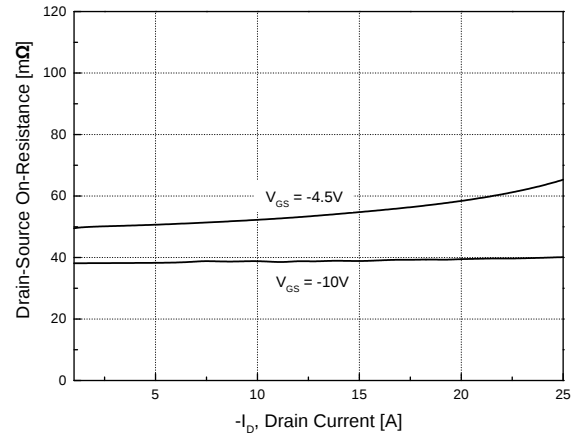


Fig.2 On-Resistance Variation with Drain Current and Gate Voltage

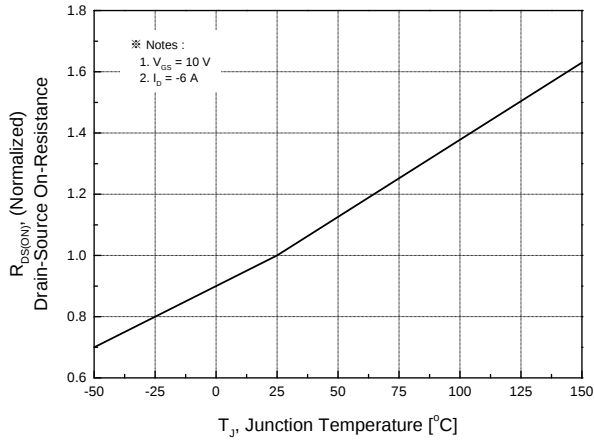


Fig.3 On-Resistance Variation with Temperature

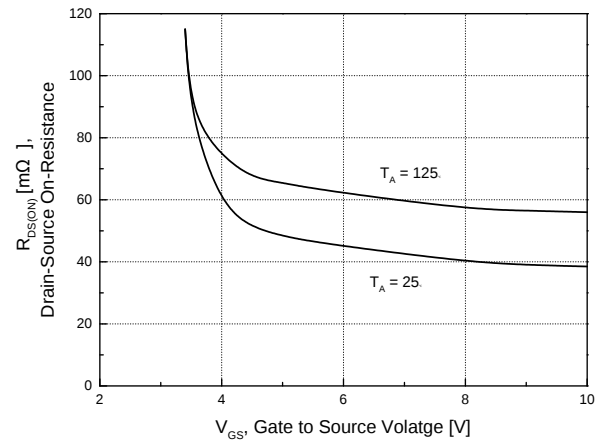


Fig.4 On-Resistance Variation with Gate to Source Voltage

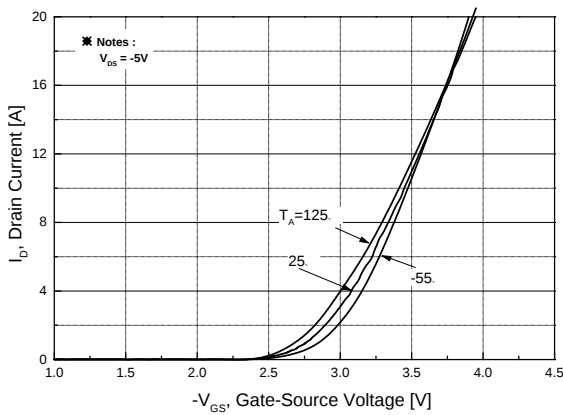


Fig.5 Transfer Characteristics

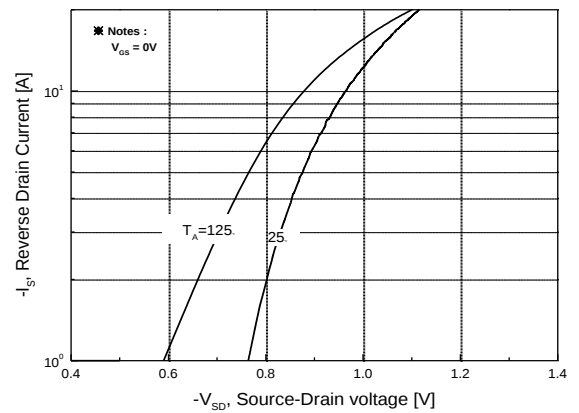


Fig.6 Body Diode Forward Voltage Variation with Source Current and Temperature

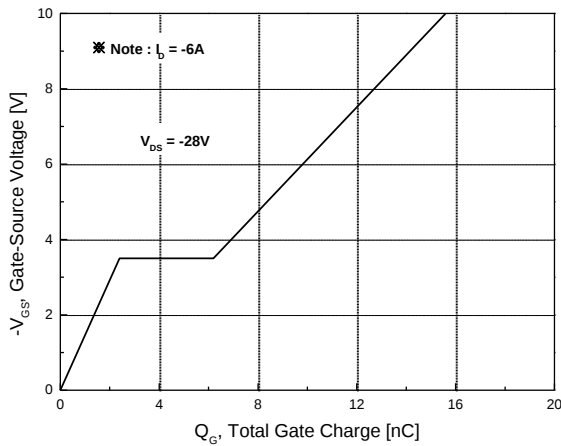


Fig.7 Gate Charge Characteristics

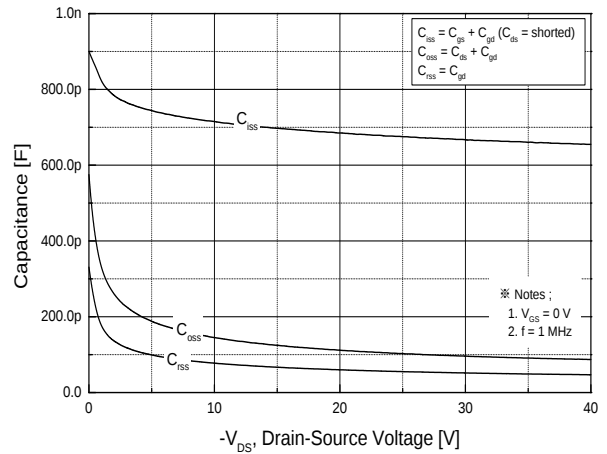


Fig.8 Capacitance Characteristics

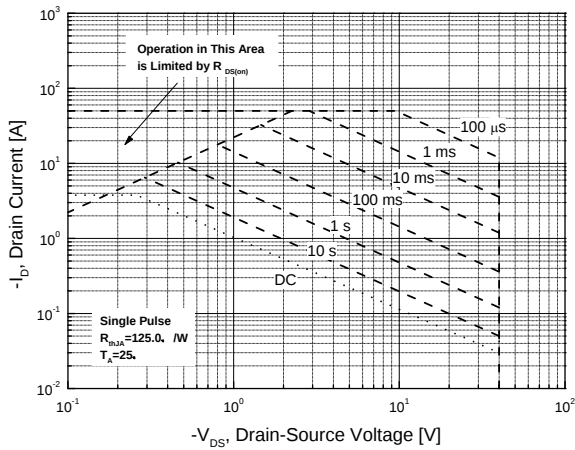


Fig.9 Maximum Safe Operating Area

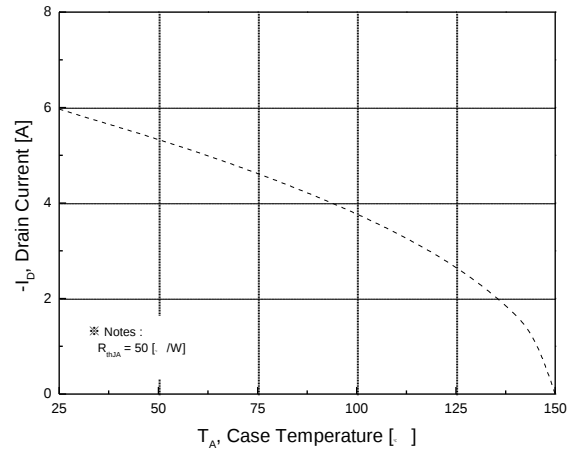


Fig.10 Maximum Drain Current vs. Case Temperature

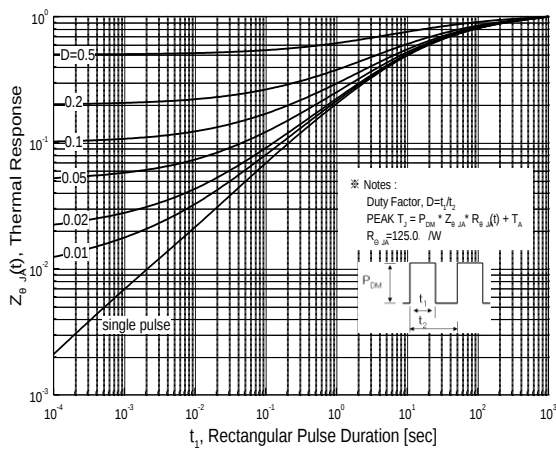
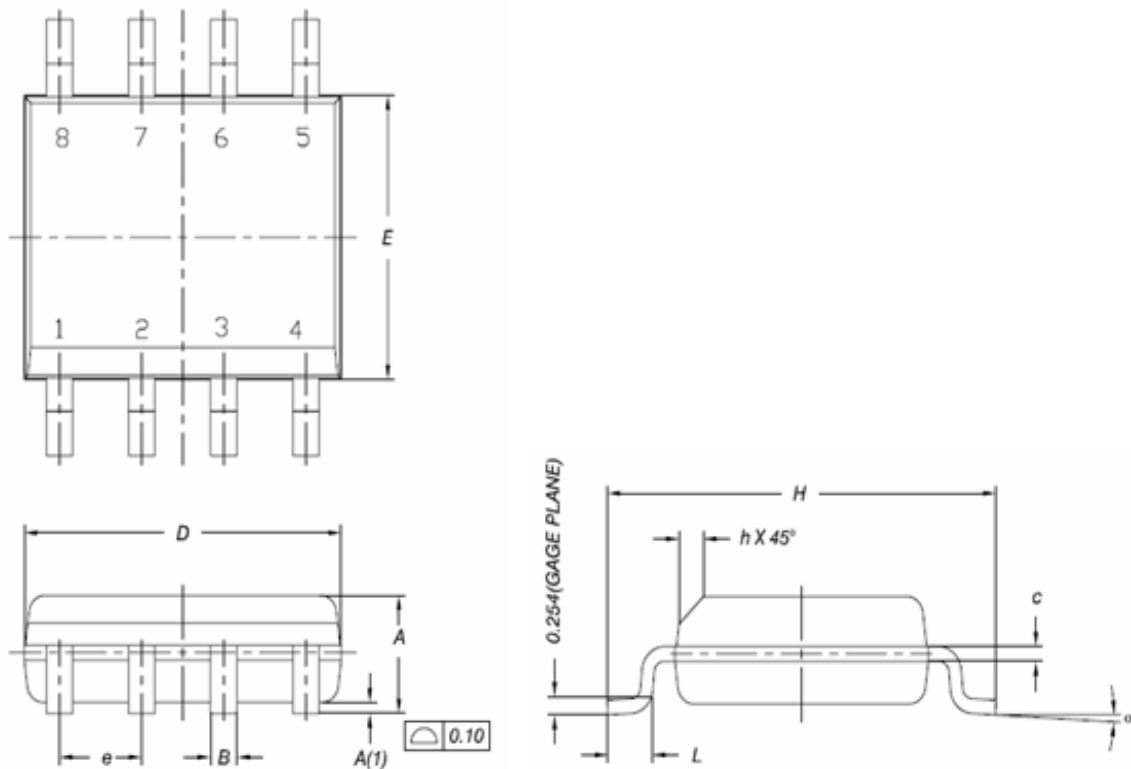


Fig.11 Transient Thermal Response Curve

Physical Dimensions

8 Leads, SOIC

Dimensions are in millimeters unless otherwise specified



Symbol	Min.	Nom.	Max.
A	–	–	1.75
A(1)	0.10	–	0.25
B	0.31	–	0.51
C	0.10	–	0.25
D	–	4.9 BSC	–
E	–	3.9 BSC	–
e	–	1.27BSC	–
H	–	6.0 BSC	–
L	0.40	–	1.27
a	0	–	8
h	0.250	–	0.500
L2(Gage Plane)	–	0.25 BSC	–

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 : usasales@magnachip.com

U.K

Knyvett House The Causeway,

Staines Middx, TW18 3BA, U.K.

Tel : +44 (0) 1784-895-000

Fax : +44 (0) 1784-895-115

E-Mail : uksales@magnachip.com

Japan

Osaka Office

3F, Shin-Osaka MT-2 Bldg 3-5-36

Miyahara Yodogawa-Ku

Osaka, 532-0003 Japan

Tel : 81-6-6394-9160

Fax : 81-6-6394-9150

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

Suite 1024, Ocean Centre 5 Canton Road,

Tsim Sha Tsui Kowloon, 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 Road3 CBD, Futian District, China

Tel : 86-755-8831-5561

Fax : 86-755-8831-5565

E-Mail : chinasales@magnachip.com

Shanghai Office

Room E, 8/F, Liaoshen International Building 1068

Wuzhong Road, (C) 201103

Shanghai, China

Tel : 86-21-6405-1521

Fax : 86-21-6505-1523

E-Mail : chinasales@magnachip.com

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.