

General Description

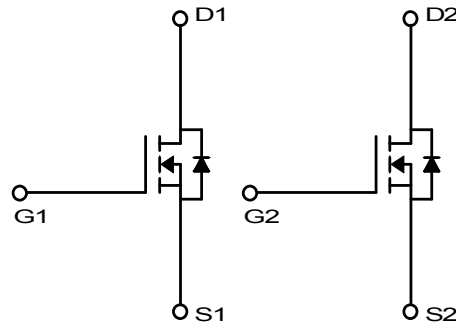
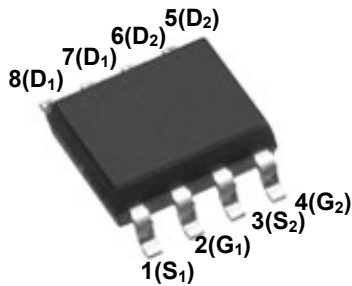
The MDS5652 uses advanced MagnaChip's MOSFET Technology, which provides low on-state resistance, high switching performance and excellent reliability.

Features

- $V_{DS} = 30V$
- $I_D = 7.5A$ @ $V_{GS} = 10V$
- $R_{DS(ON)} < 22m\Omega$ @ $V_{GS} = 10V$
 $< 35m\Omega$ @ $V_{GS} = 4.5V$

Applications

- Portable Equipment Applications
- DC-DC Converter applications
- General purpose applications



Absolute Maximum Ratings ($T_a = 25^\circ C$ unless otherwise noted)

Characteristics	Symbol	Rating	Unit
Drain-Source Voltage	V_{DSS}	30	V
Gate-Source Voltage	V_{GSS}	± 20	V
Continuous Drain Current	I_D	$T_a = 25^\circ C$	7.5
		$T_a = 100^\circ C$	4.8
Pulsed Drain Current	I_{DM}	30	A
Power Dissipation ⁽¹⁾	P_D	$T_a = 25^\circ C$	2.0
		$T_a = 100^\circ C$	0.8
Single Pulse Avalanche Energy ⁽²⁾	E_{AS}	12	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(Steady-State) ⁽¹⁾	$R_{\theta JA}$	62.5	$^\circ C/W$
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	50	

Ordering Information

Part Number	Temp. Range	Package	Packing	RoHS Status
MDS5652URH	-55~150°C	SOIC-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	30	-	-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 24V, V _{GS} = 0V			1	μA
Gate to Source Leakage Current	I _{GSS}	V _{GS} = ±20V, V _{DS} = 0V	-	-	100	nA
Gate to Source Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250μA	1	1.9	3	V
Static Drain to Source On Resistance	R _{DS(on)}	V _{GS} = 10V, I _D = 7.5A	-	16	22	mΩ
		V _{GS} = 4.5V, I _D = 5.0A		23	35	
Forward Transconductance	g _{FS}	V _{DS} = 5V, I _D = 7.5A		25	-	S
Dynamic Characteristics						
Total Gate Charge	Q _{g(10V)}	V _{DD} = 30V, I _D = 7.5A, V _{GS} = 10V	-	11.7	-	nC
Total Gate Charge	Q _{g(4.5V)}			6.1		
Gate to Source Charge	Q _{gs}			2.1		
Gate to Drain Charge	Q _{gd}			3.2		
Input Capacitance	C _{iss}	V _{DS} = 30V, V _{GS} = 0V, f = 1.0MHz	-	460	-	pF
Reverse Transfer Capacitance	C _{rss}			58		
Output Capacitance	C _{oss}			154		
Turn-On Delay Time	t _{d(on)}	V _{GS} = 10V, V _{DD} = 15V, R _L = 2.1Ω, R _{GEN} = 3Ω	-	3.8	-	ns
Turn-On Rise Time	t _r			24.6		
Turn-Off Delay Time	t _{d(off)}			17.4		
Turn-Off Fall Time	t _f			10.6		
Drain-Source Body Diode Characteristics						
Source-Drain Diode Forward Voltage	V _{SD}	I _S = 1A, V _{GS} = 0V	-	0.75		V
Body Diode Reverse Recovery Time	t _{rr}	I _F = 7.5A, di/dt = 100A/μs	-	16	-	ns
Body Diode Reverse Recovery Charge	Q _{rr}			-	7.5	-

Note :

- Surface mounted FR-4 board with 2oz. Copper.
- Starting T_J = 25°C, L = 1mH, I_{AS} = 5A, V_{DD} = 15V, V_{GS} = 10V

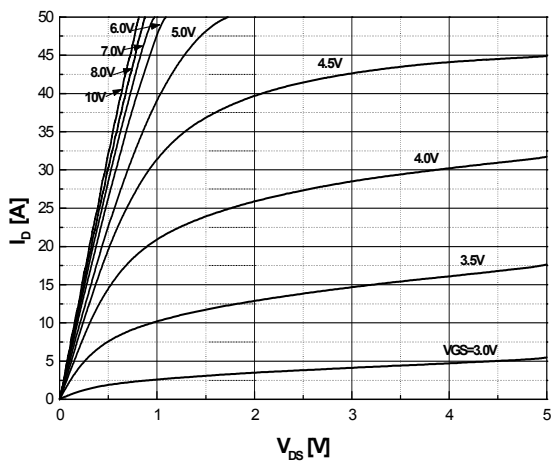


Fig.1 On-Region Characteristics



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

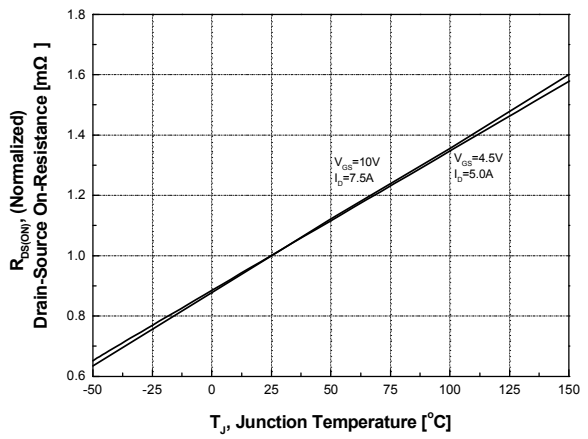


Fig.3 On-Resistance Variation with Temperature

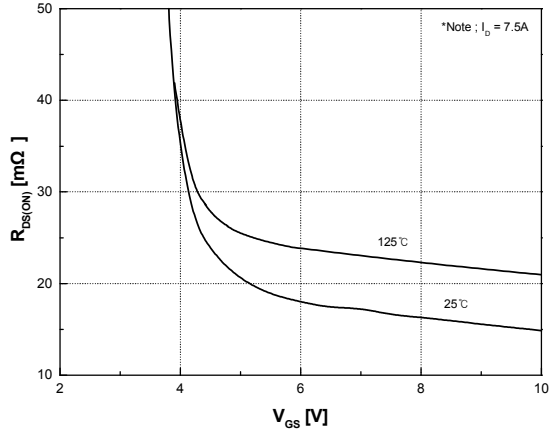


Fig.4 On-Resistance Variation with Gate to Source Voltage

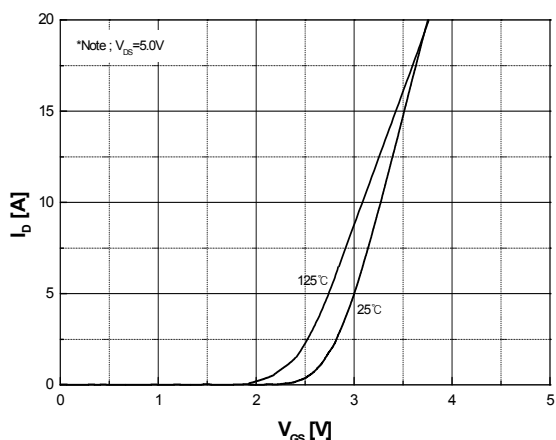


Fig.5 Transfer Characteristics

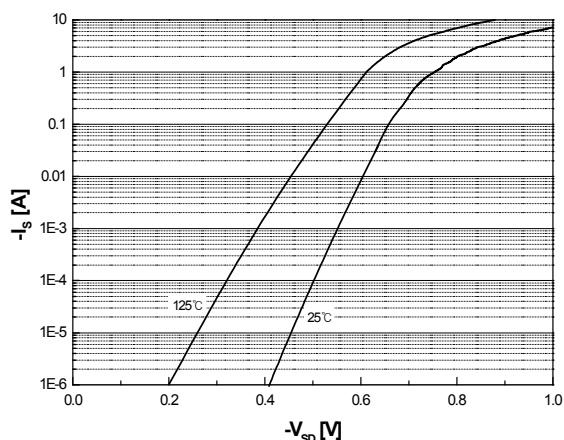


Fig.6 Body Diode Forward Voltage Variation with Source Current and Temperature

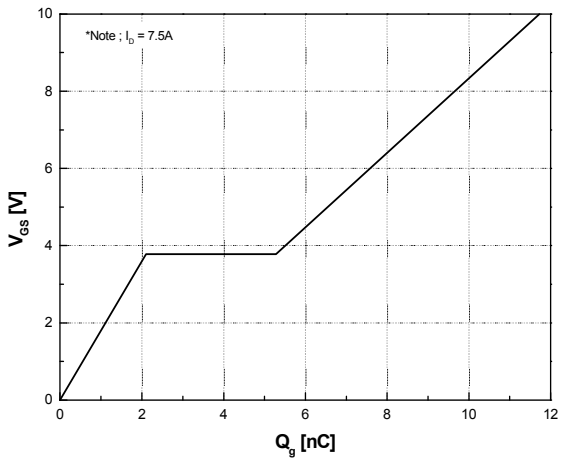


Fig.7 Gate Charge Characteristics

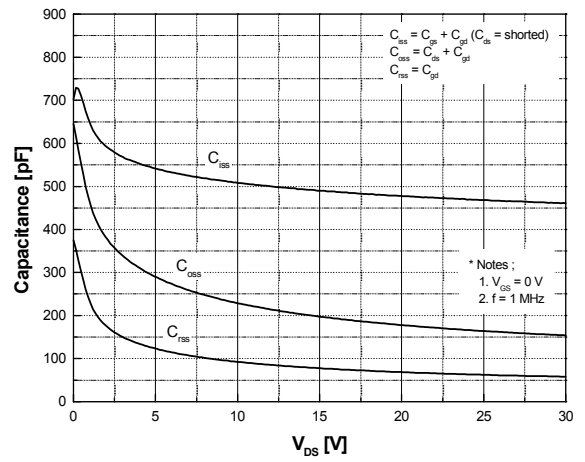


Fig.8 Capacitance Characteristics

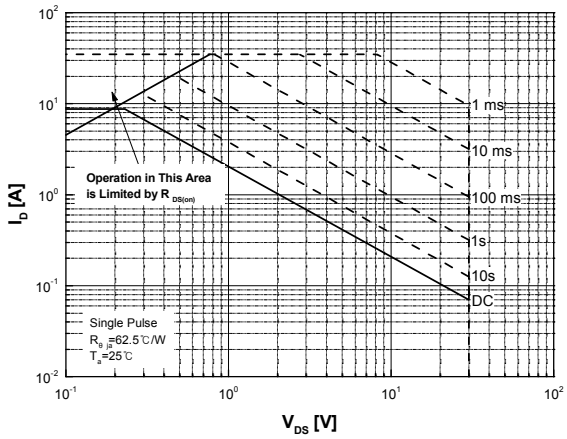


Fig.9 Maximum Safe Operating Area

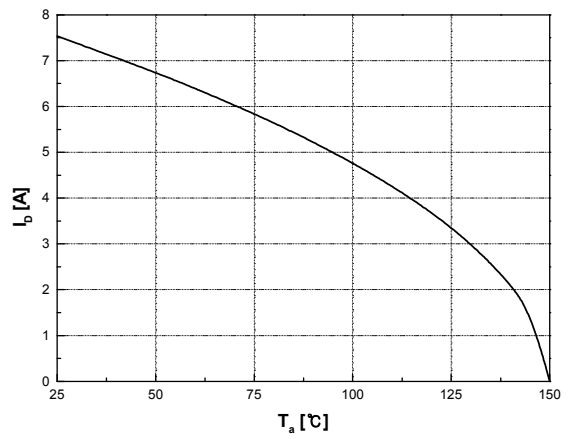


Fig.10 Maximum Drain Current Vs. Ambient Temperature

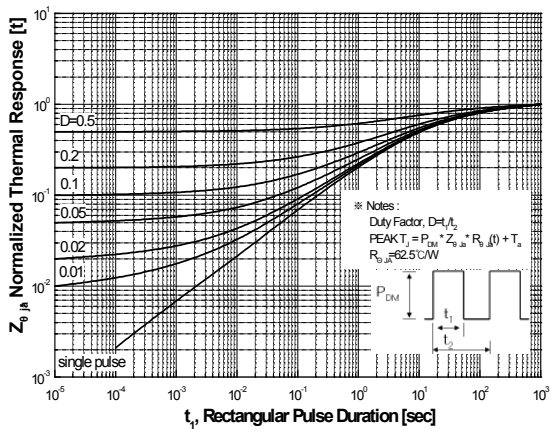
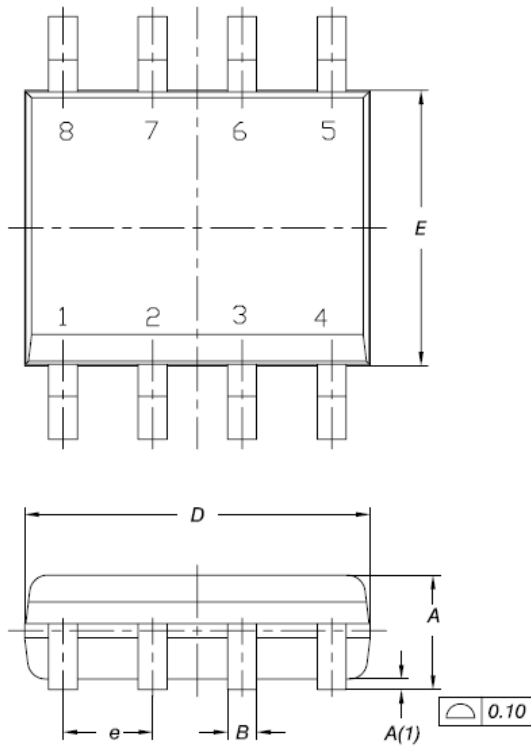


Fig.11 Transient Thermal Response Curve

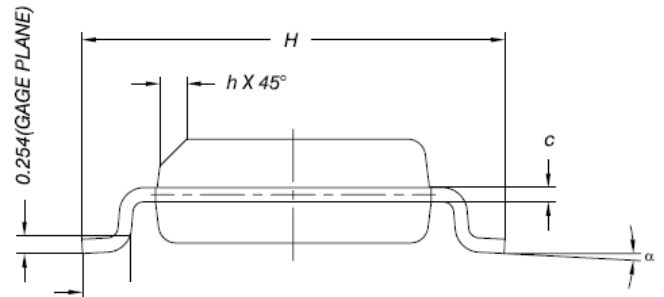
Physical Dimensions

8 Leads, SOIC

Dimensions are in millimeters unless otherwise specified



DIM.	MILLIMETERS		
	MIN.	NOM.	MAX.
A	1.35	1.55	1.75
A(1)	0.10	0.175	0.25
B	0.38	0.445	0.51
C	0.19	0.22	0.25
D	4.80	4.90	5.00
E	3.80	3.90	4.00
e	1.27 BSC		
H	5.80	6.00	6.20
L	0.50	0.715	0.93
α	0°	4°	8°
h	0.25	0.375	0.50



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Sunnyvale Office

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

Chicago Office

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U.K

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Japan

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Osaka Office

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Taiwan R.O.C

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Taipei, 114 Taiwan R.O.C
Tel : 886-2-2657-7898
Fax : 886-2-2657-8751
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China

Hong Kong Office

Office 03, 42/F, Office Tower Convention Plaza
1 Harbour Road, Wanchai, Hong Kong
Tel : 852-2828-9700
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Shenzhen Office

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

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Shanghai, China
Tel : 86-21-6373-5181
Fax : 86-21-6373-6640

Korea

891, Daechi-Dong, Kangnam-Gu
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Fax : 82-2-6903-3668 ~9
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