

General Description

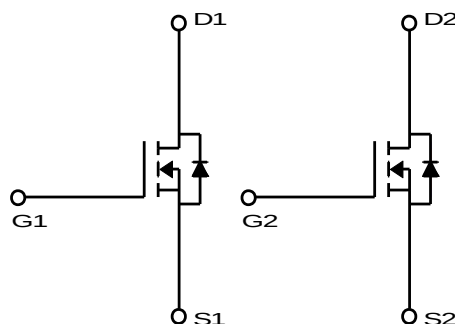
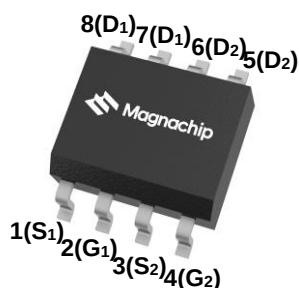
The MDS5652 uses advanced Magnachip's MOSFET Technology, which provides low on-state resistance, high switching performance and excellent reliability.

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	$T_a = 25^\circ C$	I_D	7.5	A
	$T_a = 100^\circ C$		4.8	A
Pulsed Drain Current		I_{DM}	30	A
Power Dissipation ⁽¹⁾	$T_a = 25^\circ C$	P_D	2.0	W
	$T_a = 100^\circ C$		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	-	nC

Note :

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

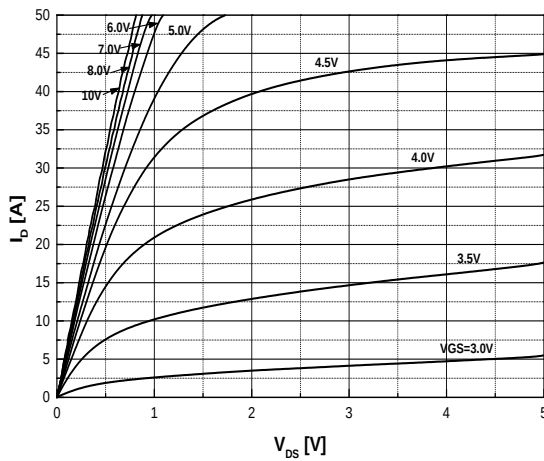


Fig.1 On-Region Characteristics

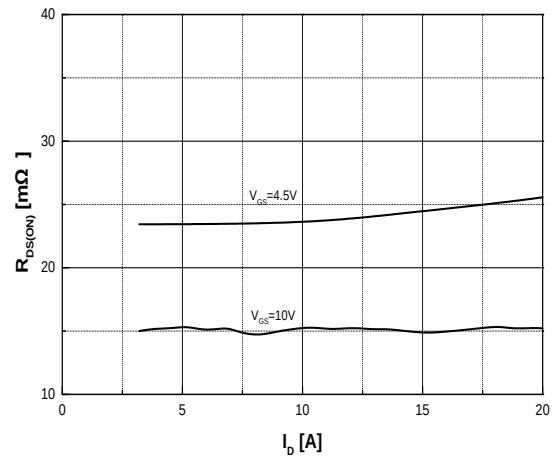


Fig.2 On-Resistance Variation with Drain Current and Gate Voltage

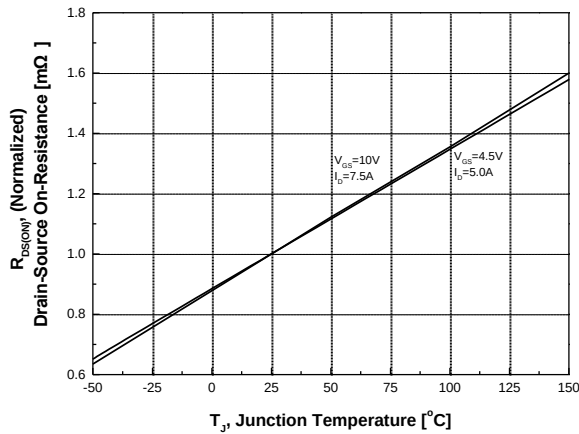


Fig.3 On-Resistance Variation with Temperature

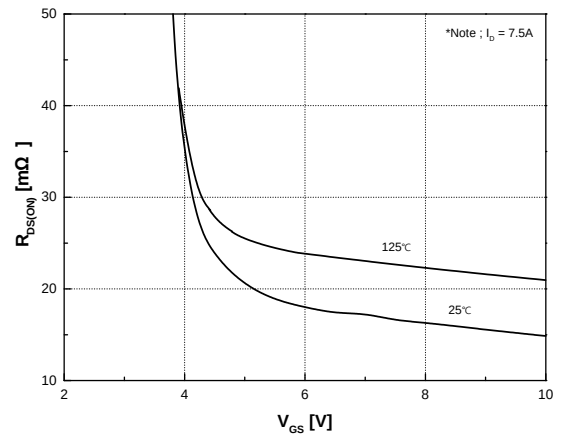


Fig.4 On-Resistance Variation with Gate to Source Voltage

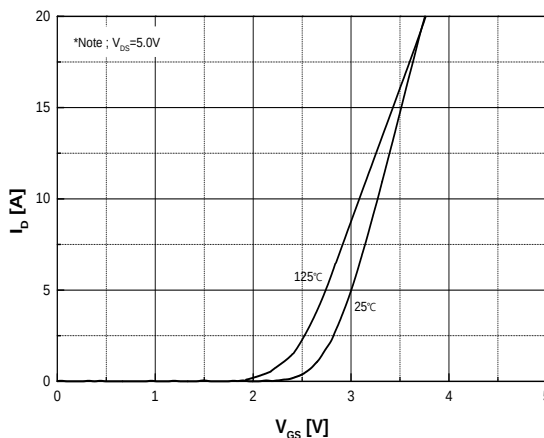


Fig.5 Transfer Characteristics

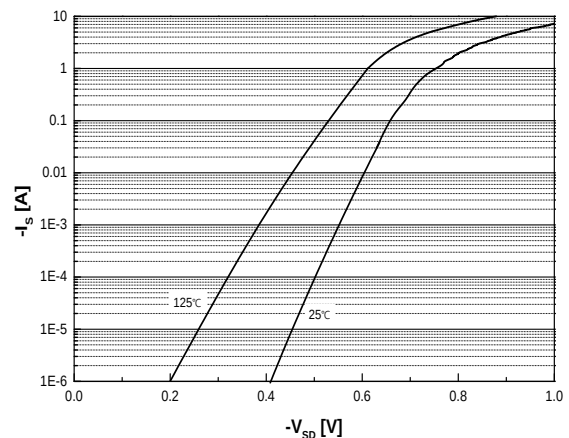


Fig.6 Body Diode Forward Voltage Variation with Source Current and Temperature

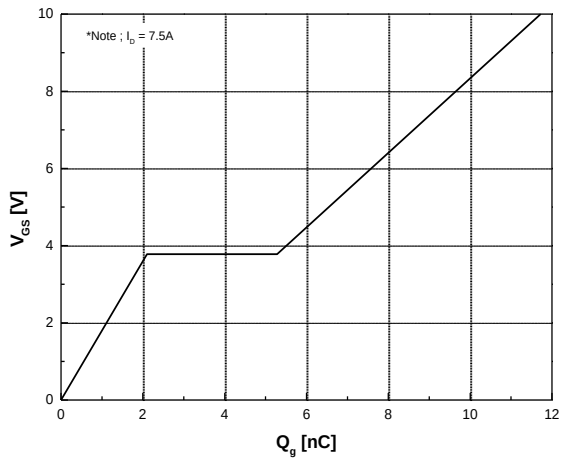


Fig.7 Gate Charge Characteristics

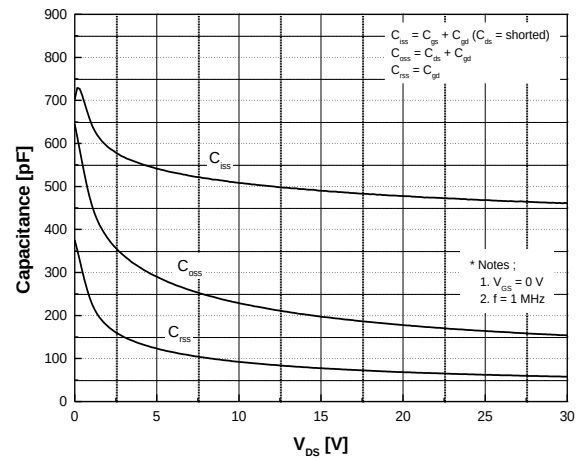


Fig.8 Capacitance Characteristics

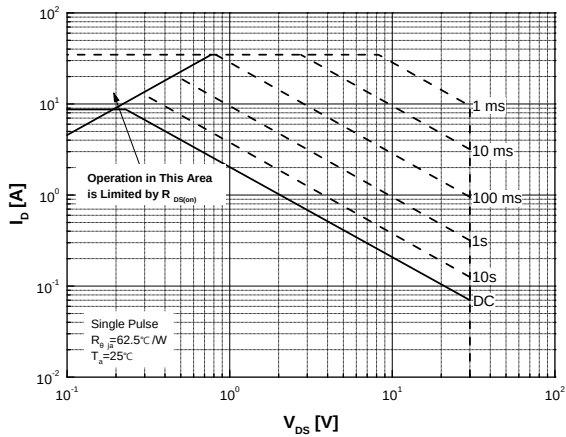


Fig.9 Maximum Safe Operating Area

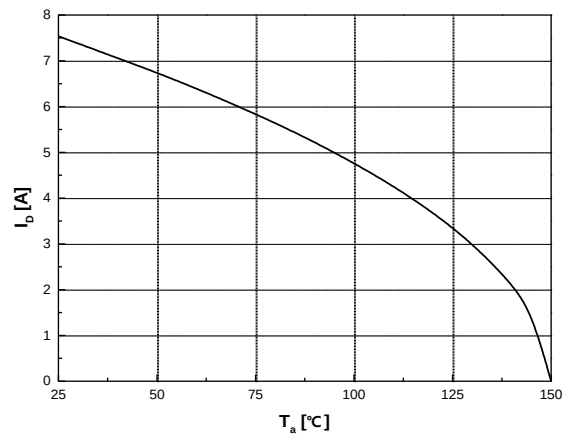


Fig.10 Maximum Drain Current Vs. Ambient Temperature

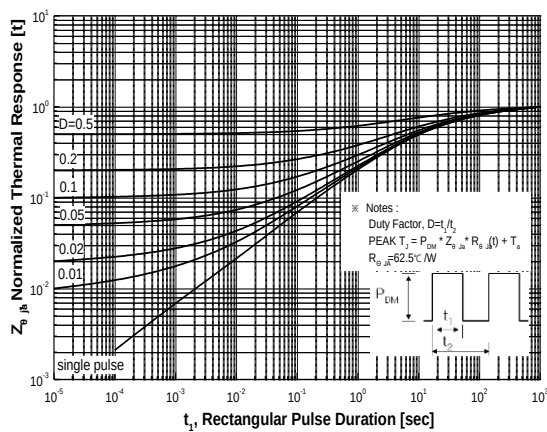
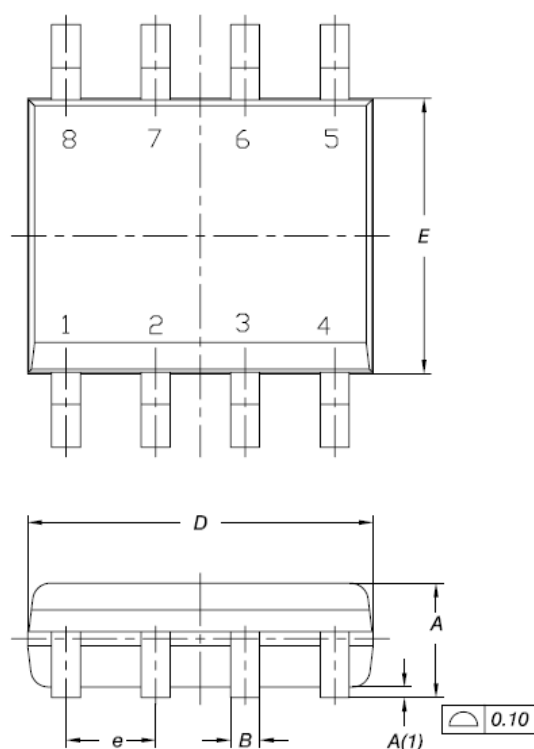


Fig.11 Transient Thermal Response Curve

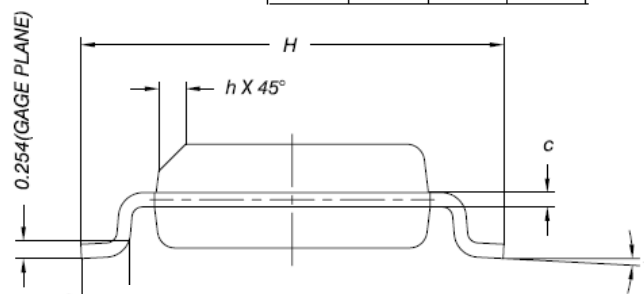
Physical Dimensions

SOIC-8L

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



Note : Package body size, length and width do not include mold flash, protrusions and gate burrs.

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