

General Description

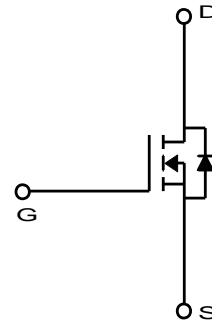
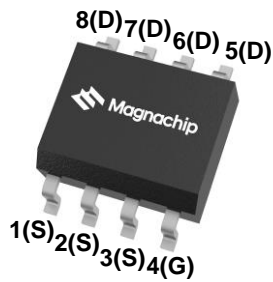
The MDS1951 uses advanced Magnachip's MOSFET Technology, which provides low on-state resistance, high switching performance and excellent reliability.

Features

- $V_{DS} = 60V$
- $I_D = 6A @ V_{GS} = 10V$
- $R_{DS(ON)} < 45m\Omega @ V_{GS} = 10V$
 $< 55m\Omega @ V_{GS} = 4.5V$

Applications

- Inverters
- General purpose applications



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

Characteristics	Symbol	Rating	Unit
Drain-Source Voltage	V_{DSS}	60	V
Gate-Source Voltage	V_{GSS}	± 20	V
Continuous Drain Current ⁽²⁾	I_D	$T_A = 25^\circ C$	6.0
		$T_A = 70^\circ C$	4.8
Pulsed Drain Current	I_{DM}	30	A
Power Dissipation for Single Operation	P_D	$T_A = 25^\circ C$	2.5
		$T_A = 70^\circ C$	1.6
Single Pulse Avalanche Energy ⁽³⁾	E_{AS}	25	mJ
Junction and Storage Temperature Range	T_J, T_{stg}	-55~150	$^\circ C$

Thermal Characteristic

Characteristics	Symbol	Rating	Unit
Thermal Resistance, Junction-to-Ambient (Steady-State) ⁽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
MDS1951URH	-55~150°C	SOIC-8	Tape & Reel	Halogen Free

Electrical Characteristics (T_a =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	60	-	-	V	
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250μA	1.0	1.9	3.0		
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 60V, 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 = 4.5A	-	37	45	mΩ	
		V _{GS} = 4.5V, I _D = 3.0A	-	44	55		
Forward Transconductance	g _{FS}	V _{DS} = 10V, I _D = 3.3A	-	11	-	S	
Dynamic Characteristics							
Total Gate Charge (V _{GS} =10V)	Q _g	V _{DS} = 30V, I _D = 4.5A, V _{GS} = 10V	-	9.0	10.5	nC	
Total Gate Charge (V _{GS} =4.5V)			-	4.4	-		
Gate-Source Charge			Q _{gs}	-	1.5		-
Gate-Drain Charge			Q _{gd}	-	2.0		-
Input Capacitance	C _{iss}	V _{DS} = 30V, V _{GS} = 0V, f = 1.0MHz	-	420	-	pF	
Reverse Transfer Capacitance	C _{rss}		-	25	-		
Output Capacitance	C _{oss}		-	50	-		
Turn-On Delay Time	t _{d(on)}	V _{GS} = 10V, V _{DS} = 30V, R _L = 6.7Ω, R _{GEN} = 5Ω	-	4.5	-	ns	
Turn-On Rise Time	t _r		-	20	-		
Turn-Off Delay Time	t _{d(off)}		-	15	-		
Turn-Off Fall Time	t _f		-	9.5	-		
Drain-Source Body Diode Characteristics							
Source-Drain Diode Forward Voltage	V _{SD}	I _S = 1.0A, V _{GS} = 0V	-	0.7	1.1	V	
Body Diode Reverse Recovery Time	t _{rr}	I _F = 4.5A, di/dt = 100A/μs	-	21	30	ns	
Body Diode Reverse Recovery Charge	Q _{rr}		-	25	-	nC	

Note :

- Surface mounted RF4 board with 2oz. Copper.
- P_D is based on T_{J(MAX)}=150°C
 - P_D (T_C=25°C) is based on R_{θJC},
 - P_D (T_A=25°C) is based on R_{θJA}, t<10sec
- Starting T_J=25°C, L=1mH, V_{GS}=10V, I_D=5A, V_{DD}=30V, Rated V_{DS}=60V

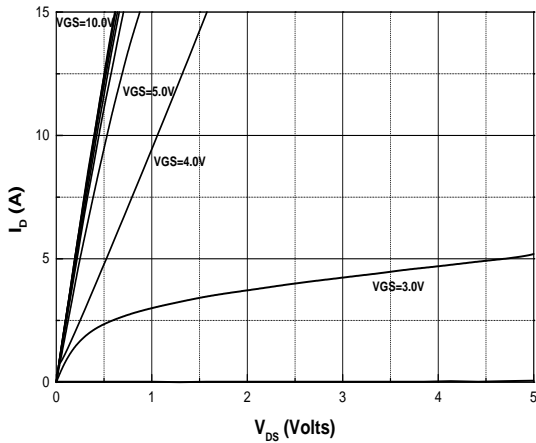


Fig.1 On-Region Characteristics

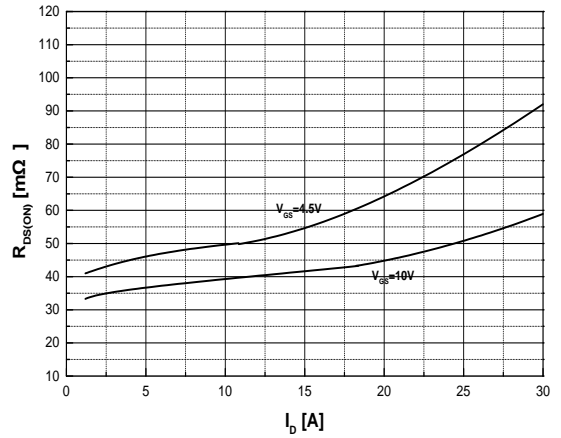


Fig.2 On-Resistance Variation with Drain Current and Gate Voltage

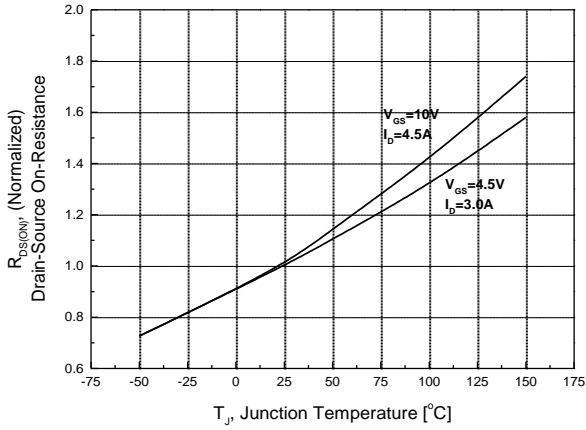


Fig.3 On-Resistance Variation with Temperature

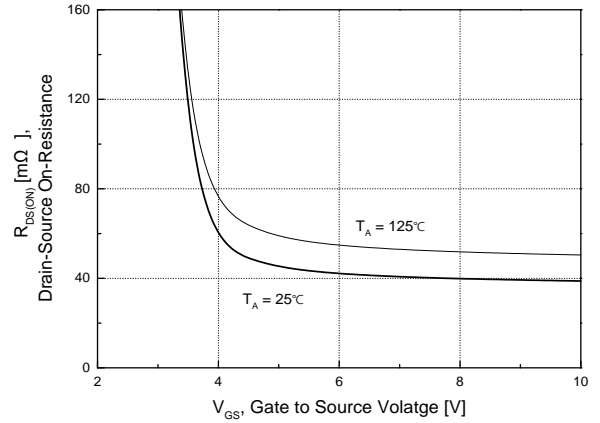


Fig.4 On-Resistance Variation with Gate to Source Voltage

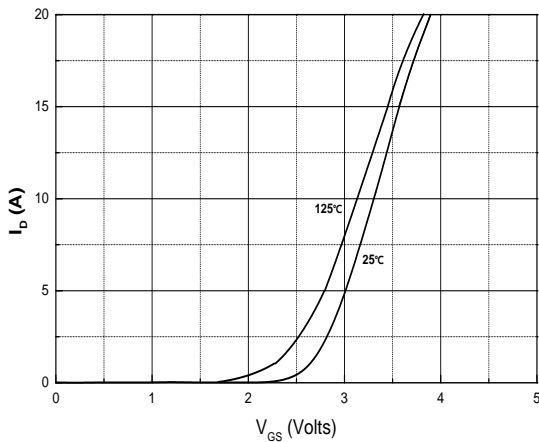


Fig.5 Transfer Characteristics

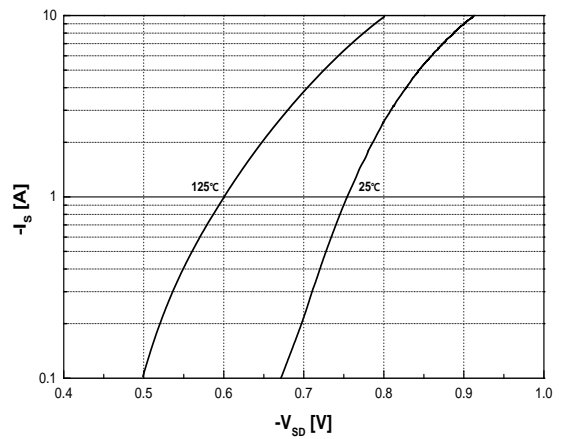


Fig.6 Body Diode Forward Voltage Variation with Source Current and Temperature

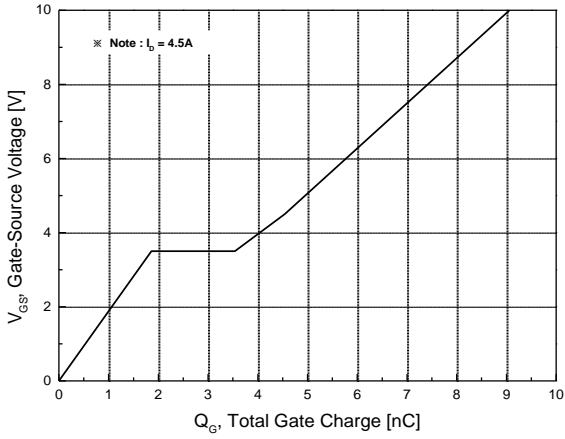


Fig.7 Gate Charge Characteristics

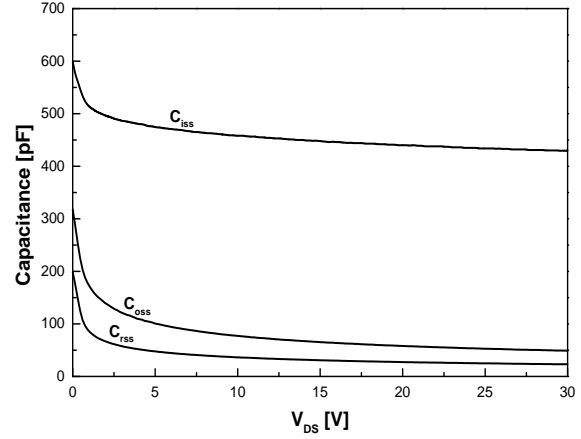


Fig.8 Capacitance Characteristics

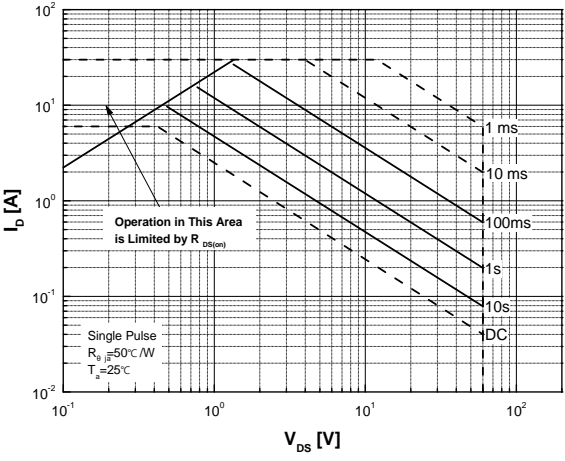


Fig.9 Maximum Safe Operating Area

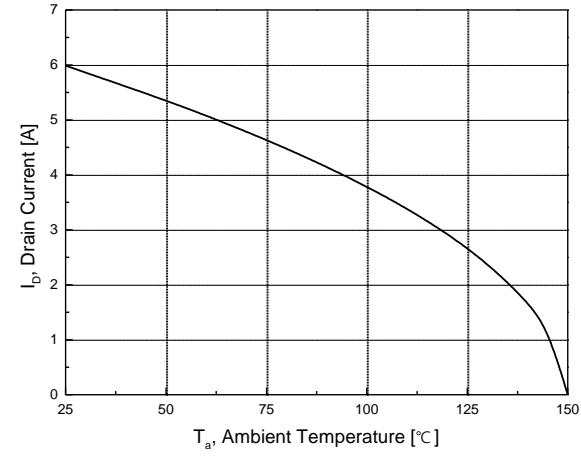


Fig.10 Maximum Drain Current vs. Ambient Temperature

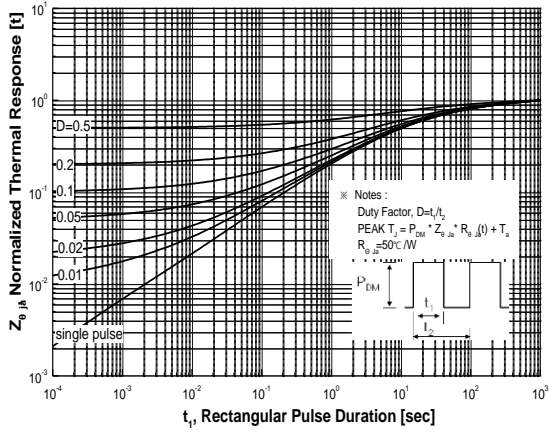
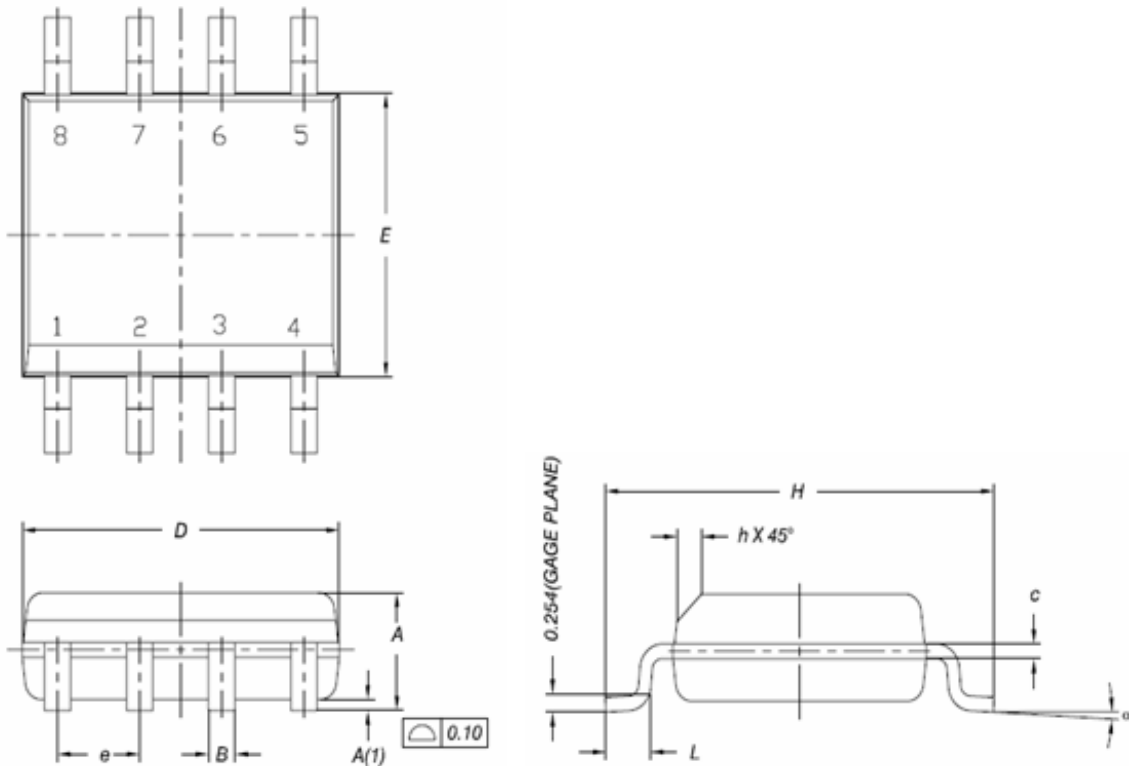


Fig.11 Transient Thermal Response Curve

Physical Dimensions

SOIC-8L

Dimensions are in millimeters unless otherwise specified




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		

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

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.

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