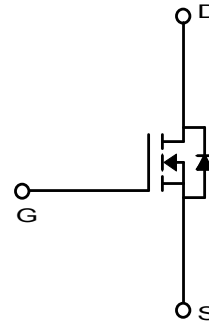
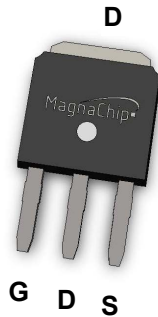


General Description

The MDIS1501 uses advanced MagnaChip's MOSFET Technology, which provides high performance in on-state resistance, fast switching performance and excellent quality. MDIS1501 is suitable device for DC to DC converter and general purpose applications.

Features

- $V_{DS} = 30V$
- $I_D = 67.4A @ V_{GS} = 10V$
- $R_{DS(ON)(MAX)} < 5.6m\Omega @ V_{GS} = 10V$
- $< 8.6m\Omega @ V_{GS} = 4.5V$
- 100% UIL Tested
- 100% Rg Tested



Absolute Maximum Ratings (Ta = 25°C)

Characteristics	Symbol	Rating	Unit
Drain-Source Voltage	V_{DSS}	30	V
Gate-Source Voltage	V_{GSS}	±20	V
Continuous Drain Current ⁽¹⁾	I_D	$T_C=25^\circ C$	67.4
		$T_C=70^\circ C$	53.9
		$T_A=25^\circ C$	25.1 ⁽³⁾
		$T_A=70^\circ C$	20.2 ⁽³⁾
Pulsed Drain Current	I_{DM}	100	A
Power Dissipation	P_D	$T_C=25^\circ C$	44.6
		$T_C=70^\circ C$	28.5
		$T_A=25^\circ C$	6.2 ⁽³⁾
		$T_A=70^\circ C$	4.0 ⁽³⁾
Single Pulse Avalanche Energy ⁽²⁾	E_{AS}	94	mJ
Junction and Storage Temperature Range	T_J, T_{stg}	-55~150	°C

Thermal Characteristics

Characteristics	Symbol	Rating	Unit
Thermal Resistance, Junction-to-Ambient ⁽¹⁾	$R_{\theta JA}$	20.0	°C/W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	2.8	

Ordering Information

Part Number	Temp. Range	Package	Packing	Quantity	Rohs Status
MDIS1501TH	-55~150°C	TO-251-VS(IPAK)	Tube	75 units /Tube	Halogen Free

Electrical Characteristics (T_J =25°C)

Characteristics	Symbol	Test Condition	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$I_D = 250\mu A, V_{GS} = 0V$	30	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	1.3	1.9	2.7	
Drain Cut-Off Current	I_{DSS}	$V_{DS} = 30V, V_{GS} = 0V$	-	-	1	μA
Gate Leakage Current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$	-	-	± 0.1	
Drain-Source ON Resistance	$R_{DS(ON)}$	$V_{GS} = 10V, I_D = 20A$	-	4.9	5.6	m Ω
		$T_J = 125^\circ C$	-	7.1	8.1	
		$V_{GS} = 4.5V, I_D = 16A$	-	7.2	8.6	
Forward Transconductance	g_{fs}	$V_{DS} = 5V, I_D = 10A$	-	35	-	S
Dynamic Characteristics						
Total Gate Charge	$Q_{g(10V)}$	$V_{DS} = 15.0V, I_D = 20A, V_{GS} = 10V$	15.5	20.7	25.9	nC
Total Gate Charge	$Q_{g(4.5V)}$		7.6	10.1	12.6	
Gate-Source Charge	Q_{gs}		-	3.7	-	
Gate-Drain Charge	Q_{gd}		-	2.9	-	
Input Capacitance	C_{iss}	$V_{DS} = 15.0V, V_{GS} = 0V, f = 1.0MHz$	1013	1350	1688	pF
Reverse Transfer Capacitance	C_{riss}		99	132	165	
Output Capacitance	C_{oss}		195	261	326	
Turn-On Delay Time	$t_{d(on)}$	$V_{GS} = 10V, V_{DS} = 15.0V, I_D = 20A, R_G = 3.0\Omega$	-	8.8	-	ns
Rise Time	t_r		-	12.2	-	
Turn-Off Delay Time	$t_{d(off)}$		-	29.5	-	
Fall Time	t_f		-	8.6	-	
Gate Resistance	R_g	$f = 1 MHz$	-	1.5	3.0	Ω
Drain-Source Body Diode Characteristics						
Source-Drain Diode Forward Voltage	V_{SD}	$I_S = 20A, V_{GS} = 0V$	-	0.8	1.1	V
Body Diode Reverse Recovery Time	t_{rr}	$I_F = 20A, di/dt = 100A/\mu s$	-	22.4	33.6	ns
Body Diode Reverse Recovery Charge	Q_{rr}		-	14.0	21.0	nC

Note :

- Surface mounted FR-4 board by JEDEC (jesd51-7)
- E_{AS} is tested at starting $T_J = 25^\circ C, L = 0.1mH, I_{AS} = 24.0A, V_{DD} = 27V, V_{GS} = 10V.$
- $T < 10sec.$

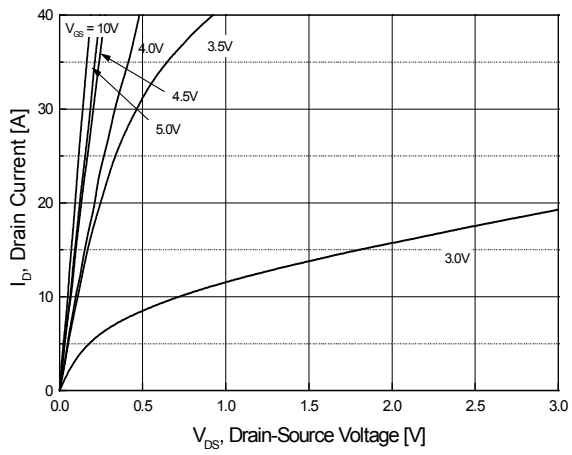


Fig.1 On-Region Characteristics

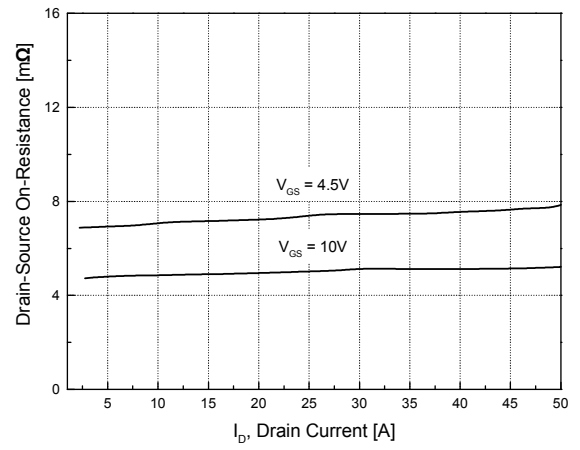


Fig.2 On-Resistance Variation with Drain Current and Gate Voltage

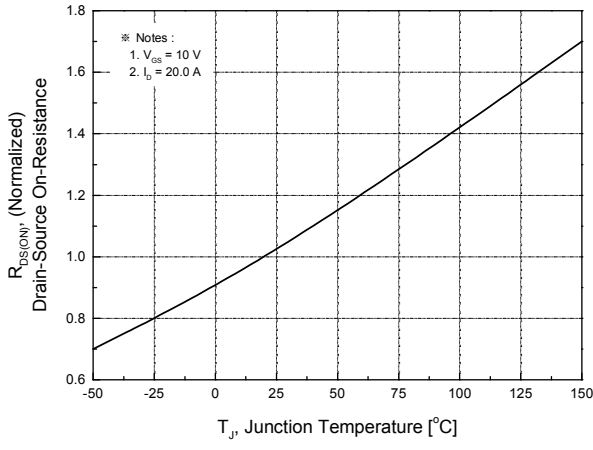


Fig.3 On-Resistance Variation with Temperature

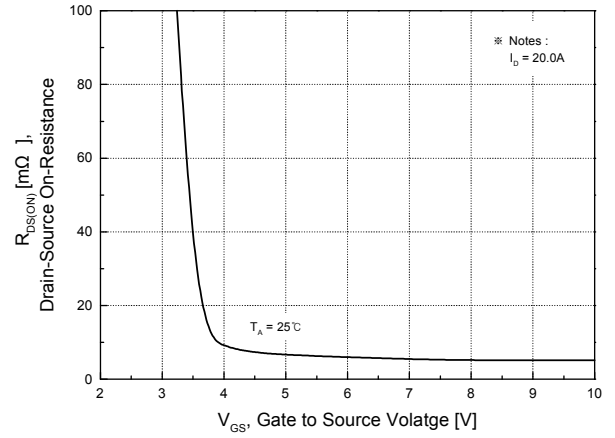


Fig.4 On-Resistance Variation with Gate to Source Voltage

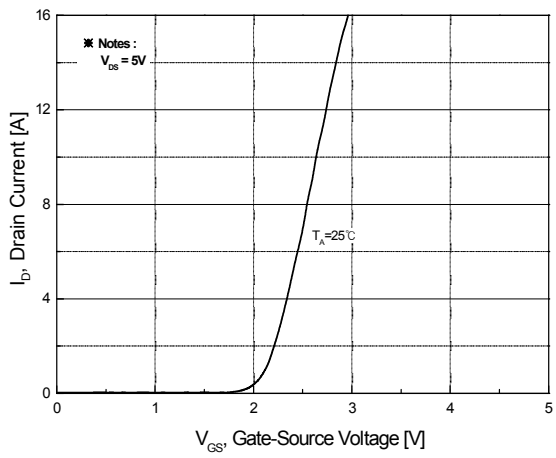


Fig.5 Transfer Characteristics

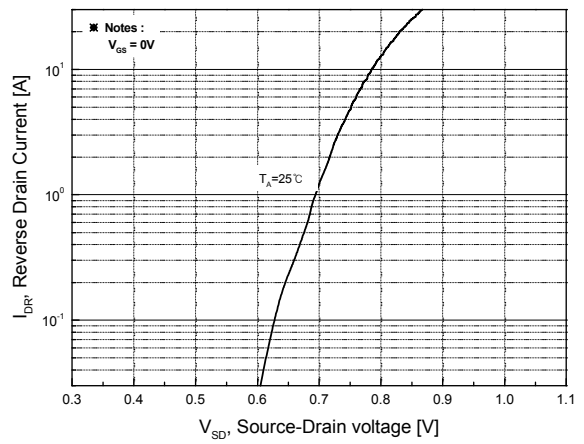


Fig.6 Body Diode Forward Voltage Variation with Source Current and Temperature

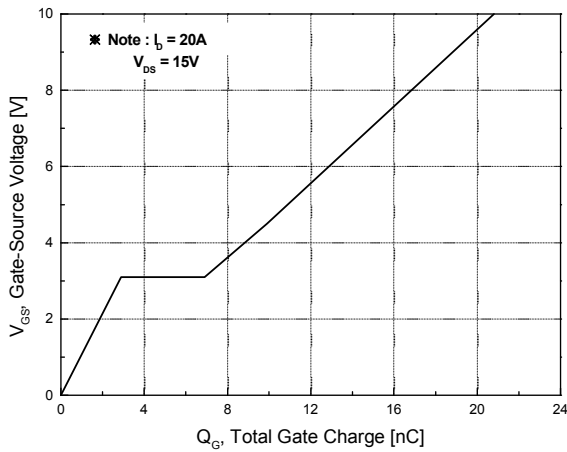


Fig.7 Gate Charge Characteristics

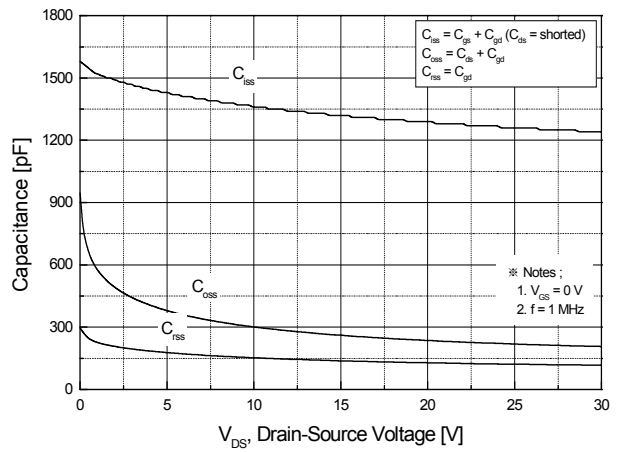


Fig.8 Capacitance Characteristics

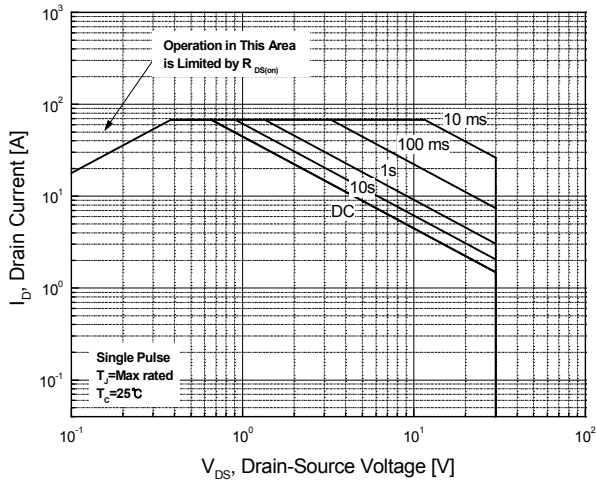


Fig.9 Maximum Safe Operating Area

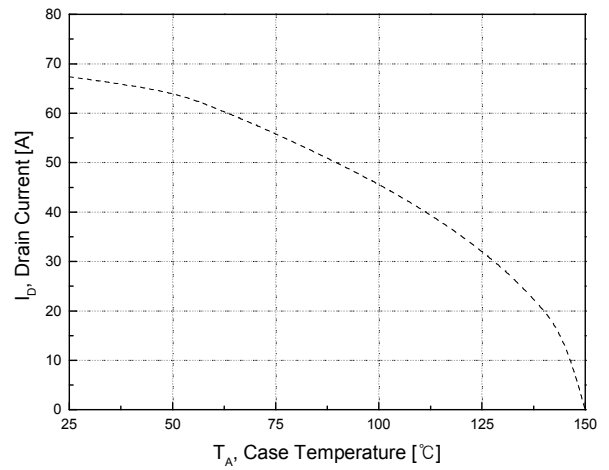


Fig.10 Maximum Drain Current vs. Case Temperature

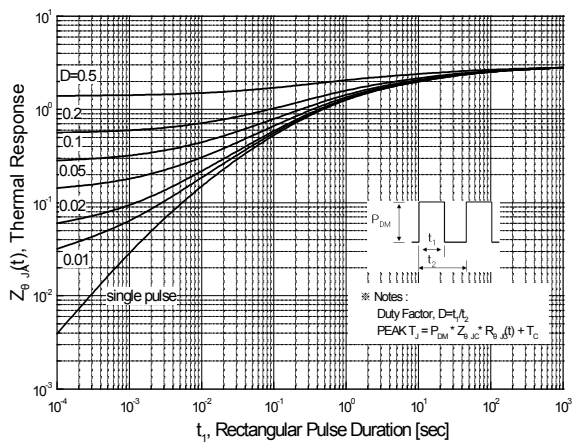
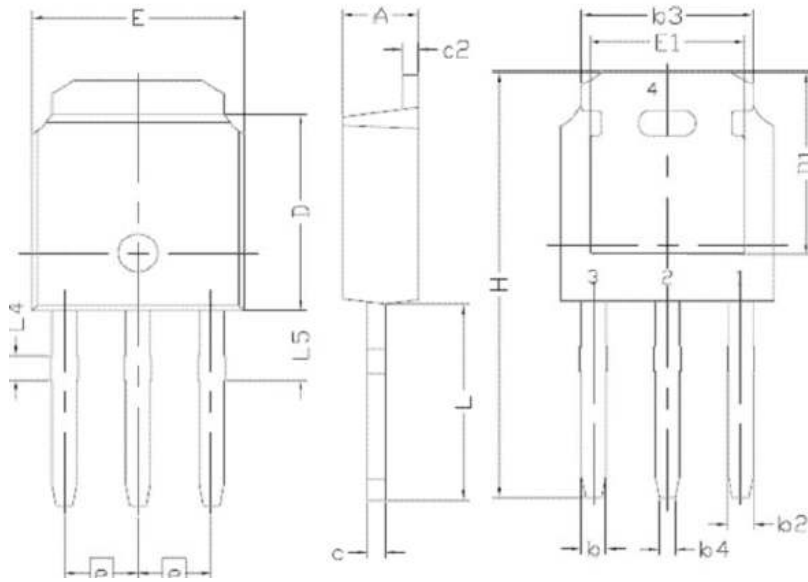


Fig.11 Transient Thermal Response Curve

Package Dimension

TO-251-VS (IPAK)

Dimensions are in millimeters, unless otherwise specified



SYMBOL	DIMENSIONAL REQMTS		
	MIN	NOM	MAX
E	6.40	6.60	6.731
L	5.88	6.08	6.28
L4	0.66	0.76	0.86
L5	1.96	2.16	2.36
D	6.00	6.10	6.223
H	12.90	13.20	13.50
b	0.64	0.76	0.88
b2	0.77	0.84	1.14
b3	5.21	5.34	5.46
b4	0.41	0.51	0.61
e	2.286 BSC		
A	2.20	2.30	2.38
c	0.40	0.50	0.60
c2	0.40	0.50	0.60
D1	5.30	--	--
E1	4.40	--	--

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