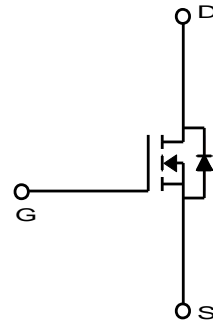
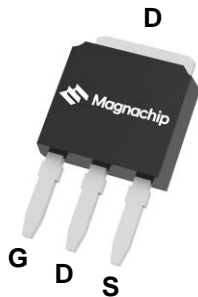


### General Description

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		$V_{GSS}$	$\pm 20$	V
Continuous Drain Current <sup>(1)</sup>	$T_C=25^\circ C$	$I_D$	67.4	A
	$T_C=70^\circ C$		53.9	
	$T_A=25^\circ C$		25.1 <sup>(3)</sup>	
	$T_A=70^\circ C$		20.2 <sup>(3)</sup>	
Pulsed Drain Current		$I_{DM}$	100	A
Power Dissipation	$T_C=25^\circ C$	$P_D$	44.6	W
	$T_C=70^\circ C$		28.5	
	$T_A=25^\circ C$		6.2 <sup>(3)</sup>	
	$T_A=70^\circ C$		4.0 <sup>(3)</sup>	
Single Pulse Avalanche Energy <sup>(2)</sup>		$E_{AS}$	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 <sup>(1)</sup>	$R_{\theta JA}$	20.0	°C/W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	2.8	

## Ordering Information

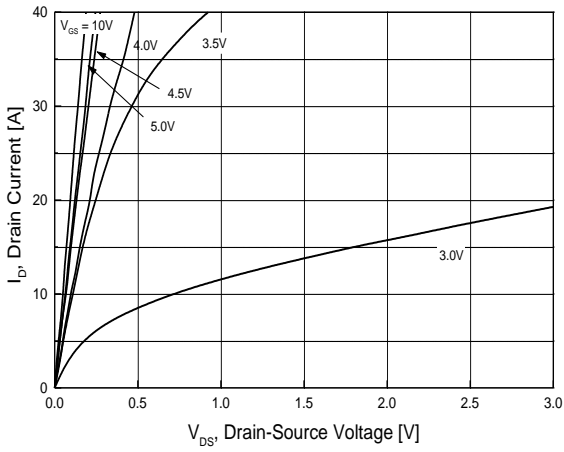
Part Number	Temp. Range	Package	Packing	Quantity	Rohs Status
MDIS1501TH	-55~150°C	TO-251-VS(IPAK)	Tube	75 units /Tube	Halogen Free

## Electrical Characteristics (T<sub>J</sub> =25°C)

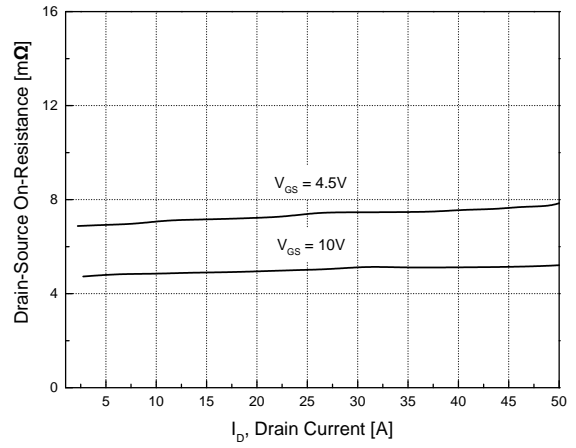
Characteristics	Symbol	Test Condition	Min	Typ	Max	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	I <sub>D</sub> = 250μA, V <sub>GS</sub> = 0V	30	-	-	V
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA	1.3	1.9	2.7	
Drain Cut-Off Current	I <sub>DSS</sub>	V <sub>DS</sub> = 30V, V <sub>GS</sub> = 0V T <sub>J</sub> =55°C	-	-	1 5	μA
Gate Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V	-	-	±0.1	
Drain-Source ON Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> = 10V, I <sub>D</sub> = 20A T <sub>J</sub> =125°C	-	4.9 7.1	5.6 8.1	mΩ
		V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 16A	-	7.2	8.6	
Forward Transconductance	g <sub>fs</sub>	V <sub>DS</sub> = 5V, I <sub>D</sub> = 10A	-	35	-	S
<b>Dynamic Characteristics</b>						
Total Gate Charge	Q <sub>g(10V)</sub>	V <sub>DS</sub> = 15.0V, I <sub>D</sub> = 20A, V <sub>GS</sub> = 10V	15.5	20.7	25.9	nC
Total Gate Charge	Q <sub>g(4.5V)</sub>		7.6	10.1	12.6	
Gate-Source Charge	Q <sub>gs</sub>		-	3.7	-	
Gate-Drain Charge	Q <sub>gd</sub>		-	2.9	-	
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> = 15.0V, V <sub>GS</sub> = 0V, f = 1.0MHz	1013	1350	1688	pF
Reverse Transfer Capacitance	C <sub>rss</sub>		99	132	165	
Output Capacitance	C <sub>oss</sub>		195	261	326	
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>GS</sub> = 10V, V <sub>DS</sub> = 15.0V, I <sub>D</sub> = 20A, R <sub>G</sub> = 3.0Ω	-	8.8	-	ns
Rise Time	t <sub>r</sub>		-	12.2	-	
Turn-Off Delay Time	t <sub>d(off)</sub>		-	29.5	-	
Fall Time	t <sub>f</sub>		-	8.6	-	
Gate Resistance	R <sub>g</sub>	f=1 MHz	-	1.5	3.0	Ω
<b>Drain-Source Body Diode Characteristics</b>						
Source-Drain Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> = 20A, V <sub>GS</sub> = 0V	-	0.8	1.1	V
Body Diode Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> = 20A, di/dt = 100A/μs	-	22.4	33.6	ns
Body Diode Reverse Recovery Charge	Q <sub>rr</sub>		-	14.0	21.0	nC

Note :

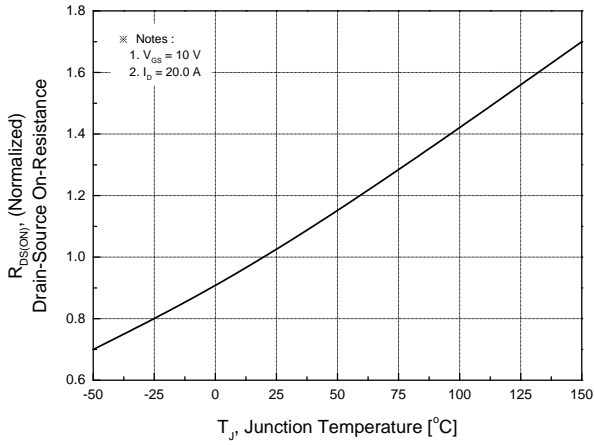
- Surface mounted FR-4 board by JEDEC (jesd51-7)
- E<sub>AS</sub> is tested at starting T<sub>j</sub> = 25°C, L = 0.1mH, I<sub>AS</sub> = 24.0A, V<sub>DD</sub> = 27V, V<sub>GS</sub> = 10V.
- T < 10sec.



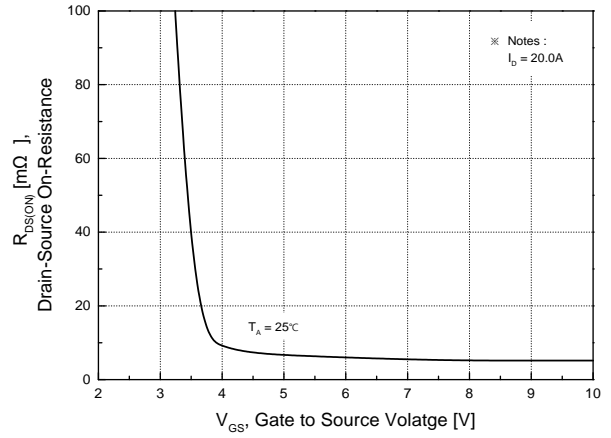
**Fig.1 On-Region Characteristics**



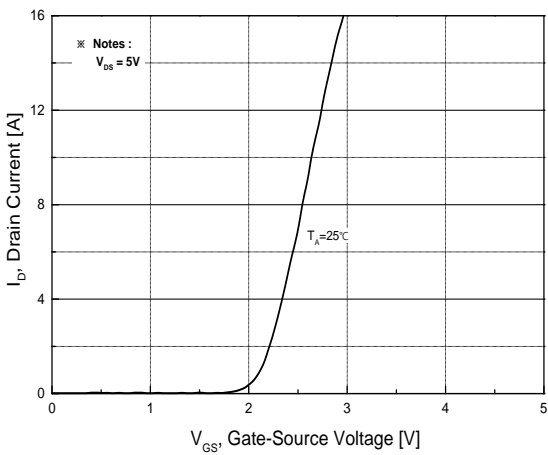
**Fig.2 On-Resistance Variation with Drain Current and Gate Voltage**



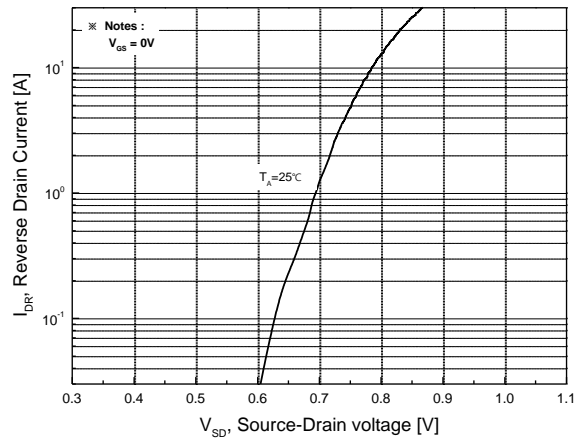
**Fig.3 On-Resistance Variation with Temperature**



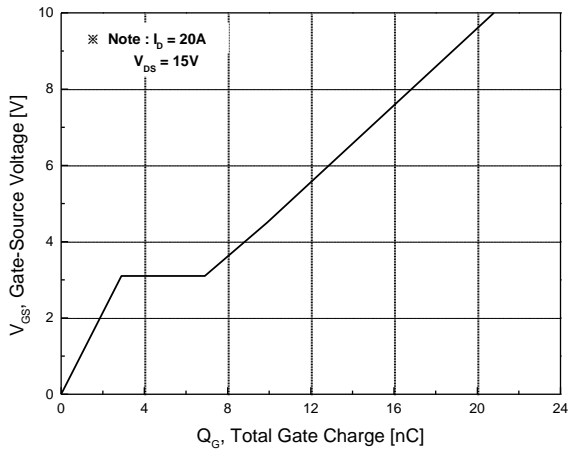
**Fig.4 On-Resistance Variation with Gate to Source Voltage**



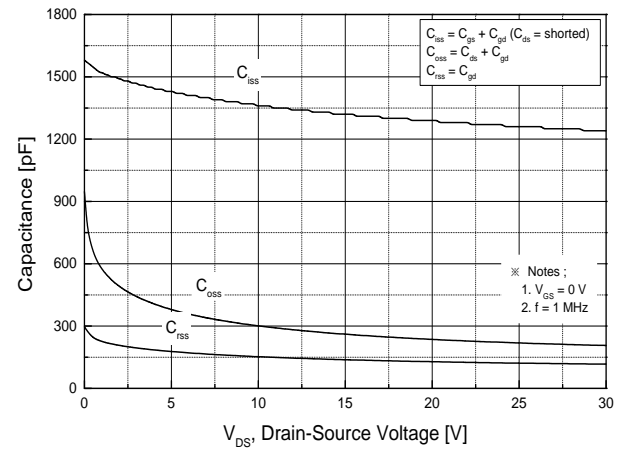
**Fig.5 Transfer Characteristics**



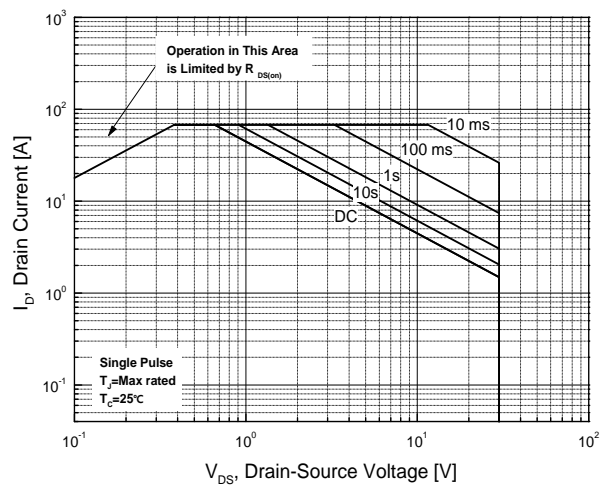
**Fig.6 Body Diode Forward Voltage Variation with Source Current and Temperature**



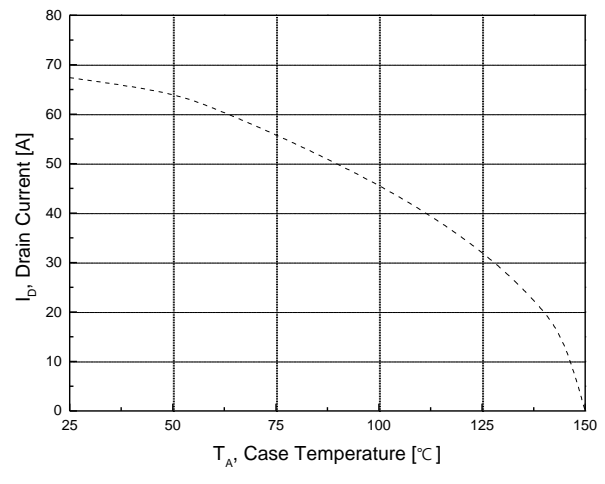
**Fig.7 Gate Charge Characteristics**



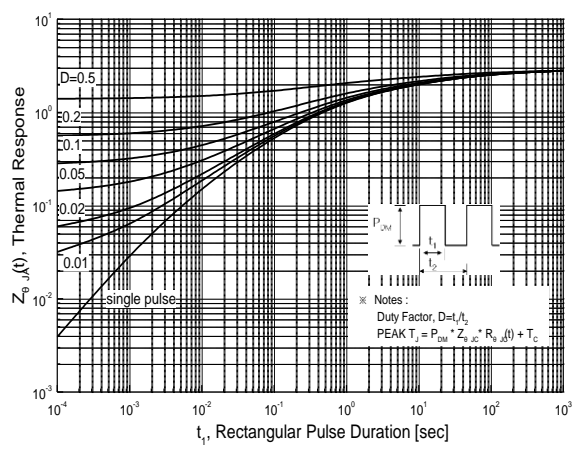
**Fig.8 Capacitance Characteristics**



**Fig.9 Maximum Safe Operating Area**



**Fig.10 Maximum Drain Current vs. Case Temperature**

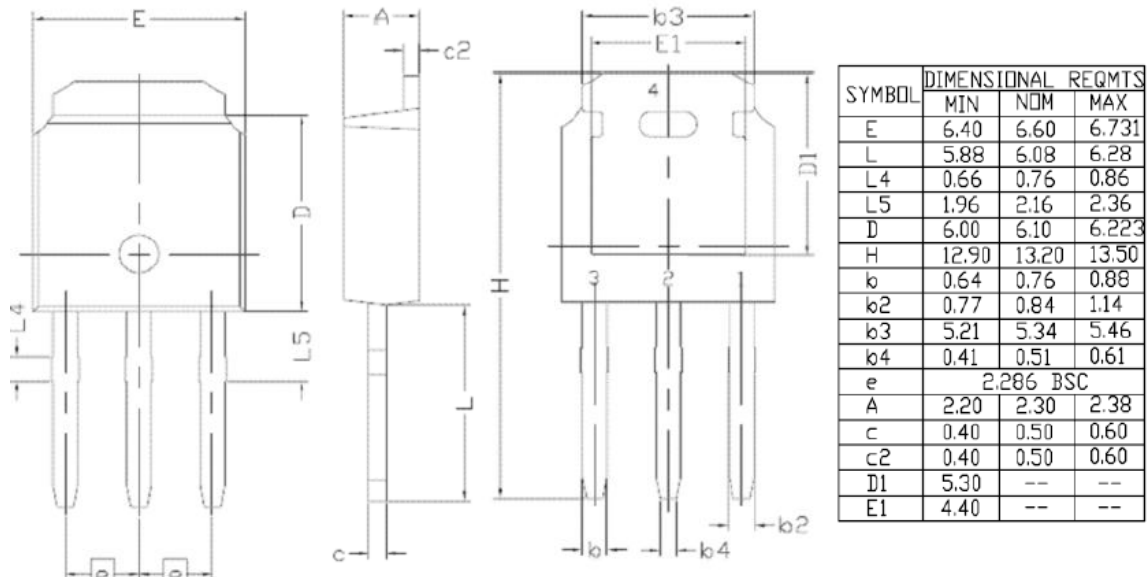


**Fig.11 Transient Thermal Response Curve**

## Package Dimension

### TO-251-VS (IPAK)


Dimensions are in millimeters, unless otherwise specified



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

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