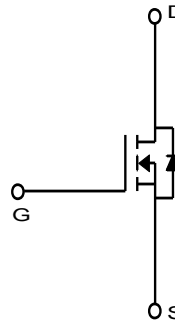
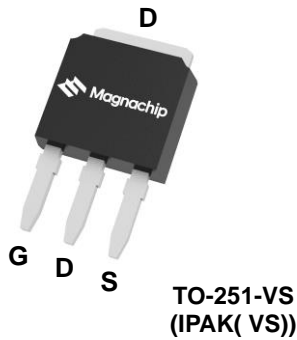


General Description

The MDIS1502 uses advanced Magnachip's MOSFET Technology, which provides high performance in on-state resistance, fast switching performance and excellent quality. MDIS1502 is suitable device for DC to DC converter and general purpose applications.

Features

- $V_{DS} = 30V$
- $I_D = 45.7A @ V_{GS} = 10V$
- $R_{DS(ON) (MAX)} < 8.5m\Omega @ V_{GS} = 10V$
 $< 13.0m\Omega @ V_{GS} = 4.5V$
- 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⁾	$T_C=25^\circ C$	I_D	45.7	A
	$T_C=70^\circ C$		36.6	
	$T_A=25^\circ C$		20.4 ⁽³⁾	
	$T_A=70^\circ C$		16.3 ⁽³⁾	
Pulsed Drain Current		I_{DM}	100	A
Power Dissipation	$T_C=25^\circ C$	P_D	31.2	W
	$T_C=70^\circ C$		20.0	
	$T_A=25^\circ C$		6.2 ⁽³⁾	
	$T_A=70^\circ C$		4.0 ⁽³⁾	
Single Pulse Avalanche Energy ⁽²⁾		E_{AS}	47	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	$R_{\theta JC}$	4.0	

Ordering Information

Part Number	Temp. Range	Package	Packing	Quantity	Rohs Status
MDIS1502TH	-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 = 250μA, V _{GS} = 0V	30	-	-	V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250μA	1.3	1.9	2.7	
Drain Cut-Off Current	I _{DSS}	V _{DS} = 30V, V _{GS} = 0V T _J =55°C	-	-	1 5	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 = 16A T _J =125°C	-	7.4 10.7	8.5 12.3	mΩ
		V _{GS} = 4.5V, I _D = 13A	-	10.8	13.0	
Forward Transconductance	g _{fs}	V _{DS} = 5V, I _D = 10A	-	25	-	S
Dynamic Characteristics						
Total Gate Charge	Q _{g(10V)}	V _{DS} = 15.0V, I _D = 16A, V _{GS} = 10V	10.7	14.3	17.9	nC
Total Gate Charge	Q _{g(4.5V)}		5.0	6.7	8.4	
Gate-Source Charge	Q _{gs}		-	2.6	-	
Gate-Drain Charge	Q _{gd}		-	2.3	-	
Input Capacitance	C _{iss}	V _{DS} = 15.0V, V _{GS} = 0V, f = 1.0MHz	696	928	1160	pF
Reverse Transfer Capacitance	C _{rss}		68	90	113	
Output Capacitance	C _{oss}		132	176	220	
Turn-On Delay Time	t _{d(on)}	V _{GS} = 10V, V _{DS} = 15.0V, I _D = 16A, R _G = 3.0Ω	-	7.2	-	ns
Rise Time	t _r		-	12.0	-	
Turn-Off Delay Time	t _{d(off)}		-	22.8	-	
Fall Time	t _f		-	8.1	-	
Gate Resistance	R _g	f=1 MHz	-	3.5	5.0	Ω
Drain-Source Body Diode Characteristics						
Source-Drain Diode Forward Voltage	V _{SD}	I _S = 16A, V _{GS} = 0V	-	0.8	1.1	V
Body Diode Reverse Recovery Time	t _{rr}	I _F = 16A, di/dt = 100A/μs	-	20.4	30.6	ns
Body Diode Reverse Recovery Charge	Q _{rr}		-	11.9	17.9	nC

Note :

- Surface mounted FR-4 board by JEDEC (jesd51-7)
- E_{AS} is tested at starting T_j = 25 °C, L = 0.1mH, I_{AS} = 17.0A, V_{DD} = 27V, V_{GS} = 10V.
- T < 10sec.

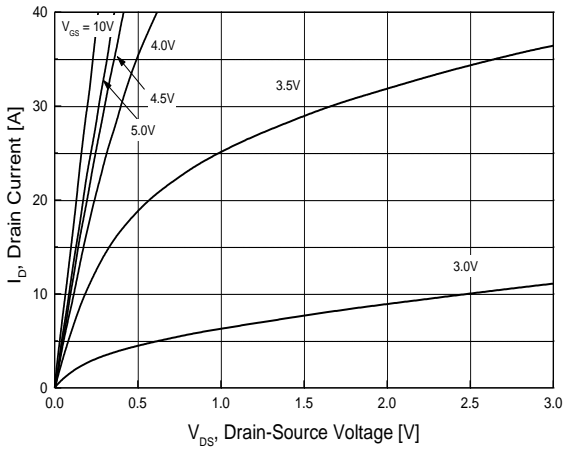


Fig.1 On-Region Characteristics

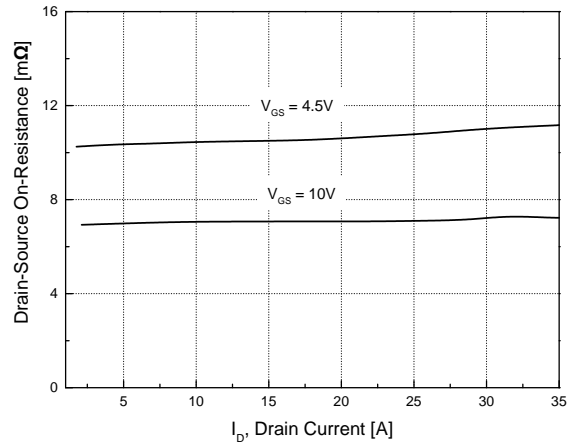


Fig.2 On-Resistance Variation with Drain Current and Gate Voltage

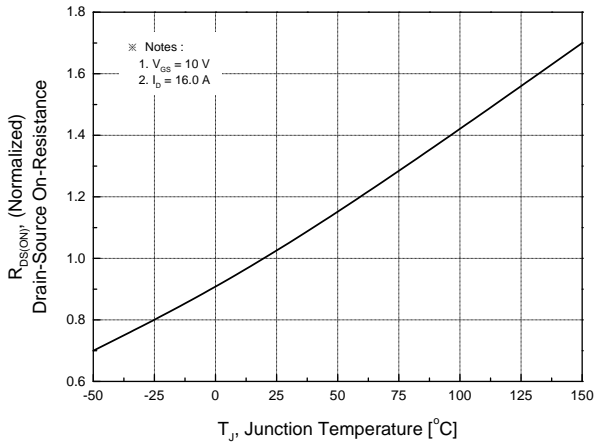


Fig.3 On-Resistance Variation with Temperature

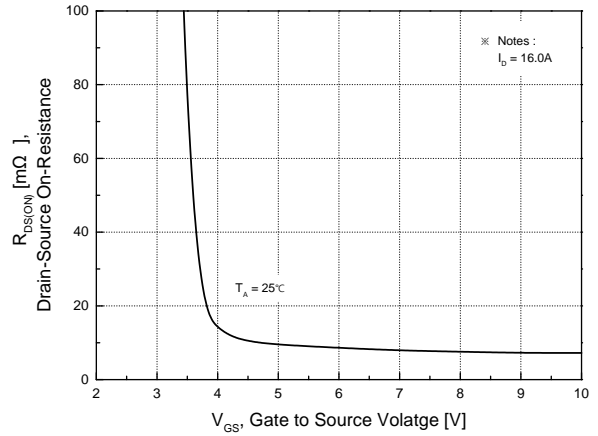


Fig.4 On-Resistance Variation with Gate to Source Voltage

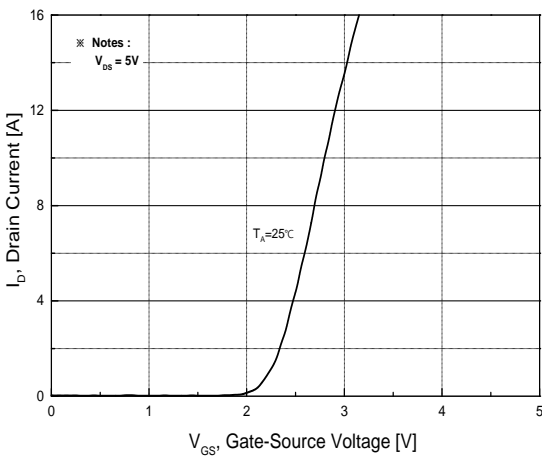


Fig.5 Transfer Characteristics

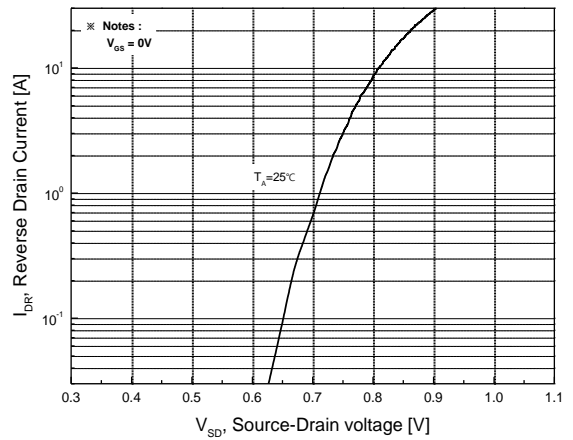
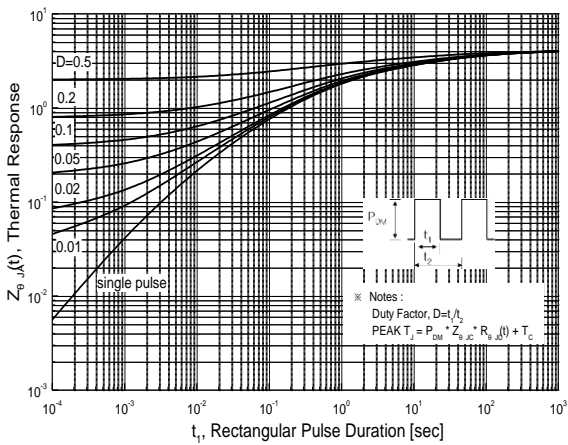
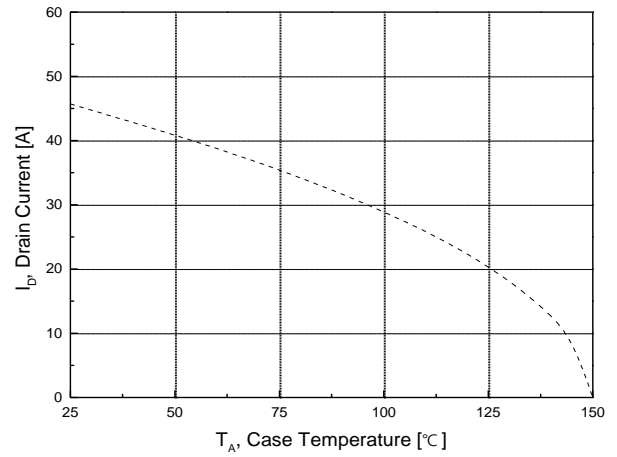
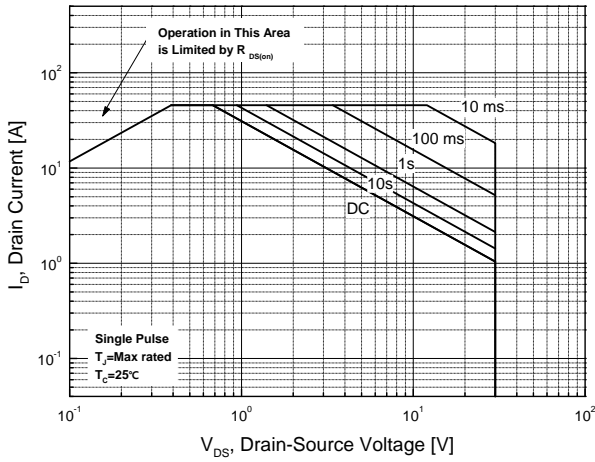
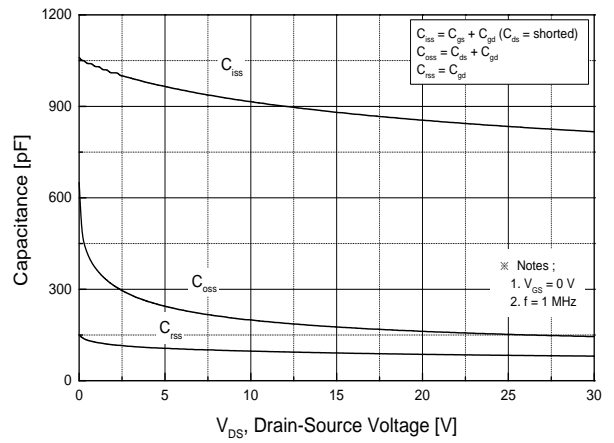
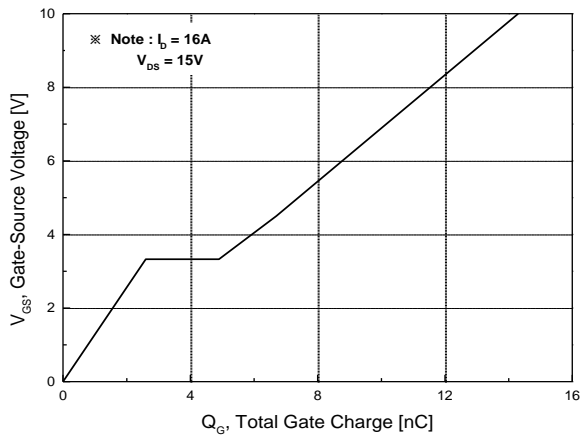
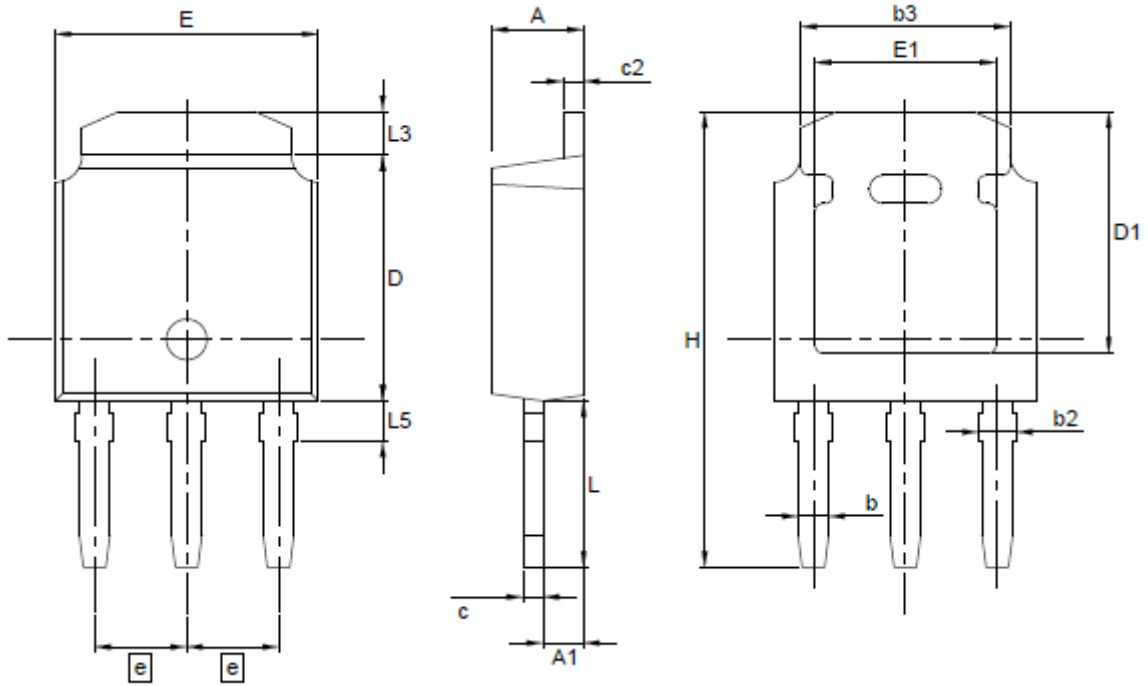


Fig.6 Body Diode Forward Voltage Variation with Source Current and Temperature



Package Dimension

TO-251-VS




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

Symbol	Dimension (mm)		
	Min	Nom	Max
A	2.18	-	2.39
A1	0.89	-	1.15
b	0.64	-	0.89
b2	0.76	-	1.14
b3	4.95	-	5.46
c	0.40	-	0.61
c2	0.40	-	0.61
D	5.97	-	6.223
D1	5.10	-	-
e	2.286 BSC		
E	6.35	-	6.73
E1	4.32	-	-
H	10.26	-	11.45
L	3.98	-	4.28
L3	0.89	-	1.27
L5	-	-	1.23

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