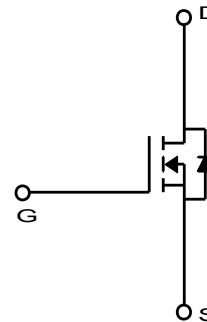
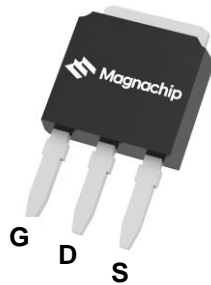


General Description

The MDIS1903 uses advanced Magnachip's MOSFET Technology, which provides high performance in on-state resistance, fast switching performance and excellent quality. MDIS1903 is suitable device for DC to DC converter and general purpose applications.

Features

- $V_{DS} = 100V$
- $I_D = 12.8A @ V_{GS} = 10V$
- $R_{DS(ON) (MAX)} < 105m\Omega @ V_{GS} = 10V$
 $< 110m\Omega @ V_{GS} = 6.0V$



Absolute Maximum Ratings (Tc = 25°C)

Characteristics	Symbol	Rating	Unit
Drain-Source Voltage	V_{DSS}	100	V
Gate-Source Voltage	V_{GSS}	±20	V
Continuous Drain Current ⁽¹⁾	I_D	$T_C=25^\circ C$	12.8
		$T_C=70^\circ C$	10.3
Pulsed Drain Current	I_{DM}	40	A
Power Dissipation	P_D	$T_C=25^\circ C$	36.8
		$T_C=70^\circ C$	23.6
Single Pulse Avalanche Energy ⁽²⁾	E_{AS}	21	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⁾	$R_{\theta JA}$	52	°C/W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	3.4	

Ordering Information

Part Number	Temp. Range	Package	Packing	Rohs Status
MDIS1903TH	-55~150°C	TO-251-VS(IPAK)	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	100	-	-	V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250μA	1.0	2.0	3.0	
Drain Cut-Off Current	I _{DSS}	V _{DS} = 80V, 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 = 10A	-	85	105	mΩ
		V _{GS} = 6.0V, I _D = 10A	-	90	110	
Forward Transconductance	g _{fs}	V _{DS} = 10V, I _D = 10A	-	17	-	S
Dynamic Characteristics						
Total Gate Charge	Q _{g(10V)}	V _{DS} = 50.0V, I _D = 10A, V _{GS} = 10V	-	8.8	-	nC
Gate-Source Charge	Q _{gs}		-	1.7	-	
Gate-Drain Charge	Q _{gd}		-	2.3	-	
Input Capacitance	C _{iss}	V _{DS} = 25.0V, V _{GS} = 0V, f = 1.0MHz	-	475	800	pF
Reverse Transfer Capacitance	C _{rss}		-	20	-	
Output Capacitance	C _{oss}		-	60	-	
Turn-On Delay Time	t _{d(on)}	V _{GS} = 10V, V _{DS} = 50V, I _D = 10A, R _G = 3.0Ω	-	6.8	-	ns
Rise Time	t _r		-	10.6	-	
Turn-Off Delay Time	t _{d(off)}		-	16.2	-	
Fall Time	t _f		-	5.5	-	
Drain-Source Body Diode Characteristics						
Source-Drain Diode Forward Voltage	V _{SD}	I _S = 10A, V _{GS} = 0V	-	0.75	1.2	V
Body Diode Reverse Recovery Time	t _{rr}	I _F = 10A, di/dt = 100A/μs	-	42.0	-	ns
Body Diode Reverse Recovery Charge	Q _{rr}		-	69.0	-	nC

Note :

- Surface mounted FR-4 board by JEDEC (jesd51-7)
- E_{AS} is tested at starting T_J = 25°C, L = 1.0mH, I_{AS} = 6.5A, V_{DD} = 50V, V_{GS} = 10V

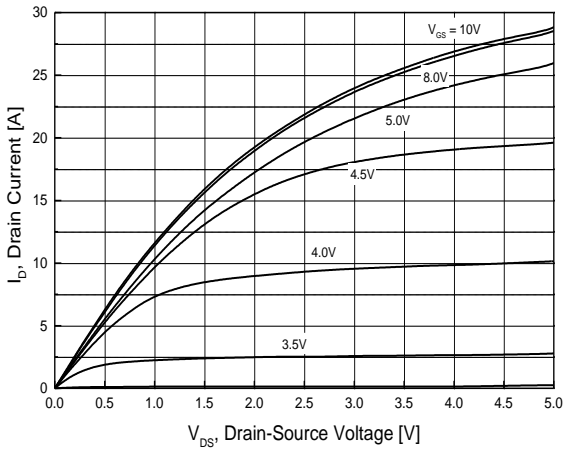


Fig.1 On-Region Characteristics

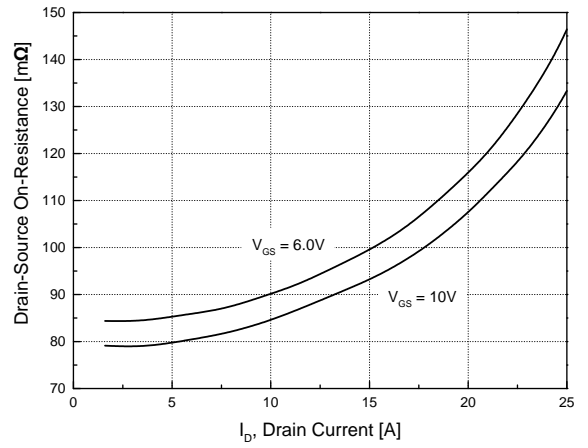


Fig.2 On-Resistance Variation with Drain Current and Gate Voltage

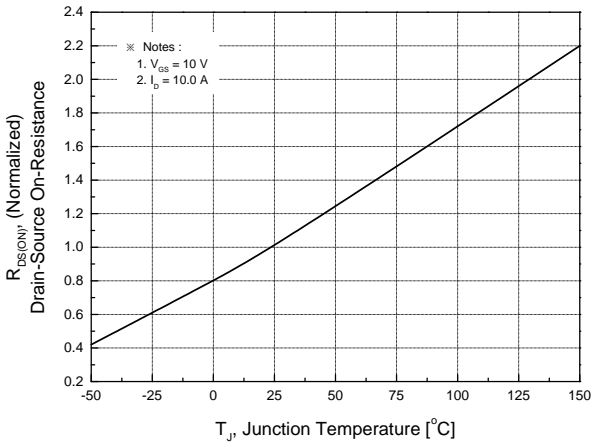


Fig.3 On-Resistance Variation with Temperature

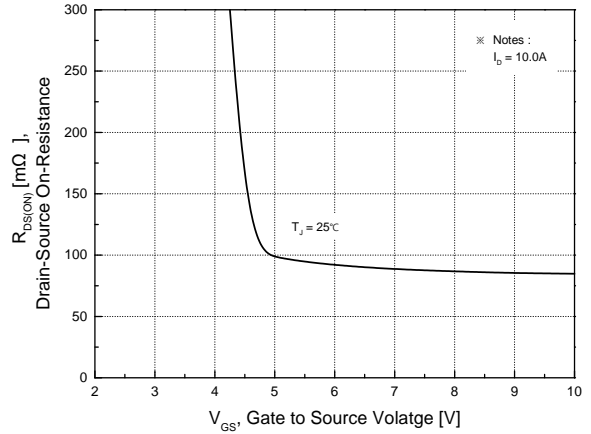


Fig.4 On-Resistance Variation with Gate to Source Voltage

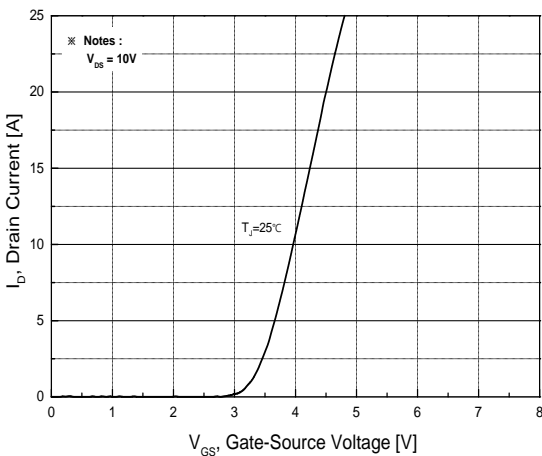


Fig.5 Transfer Characteristics

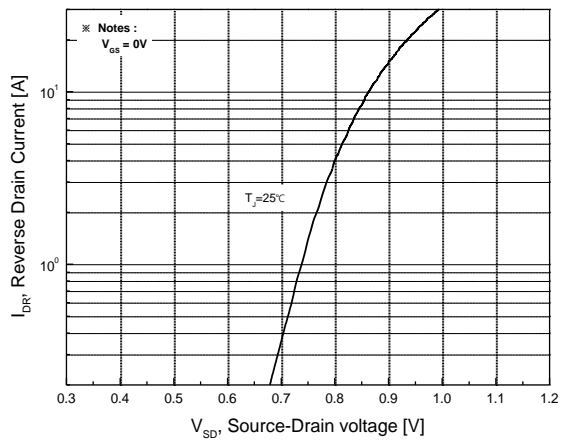


Fig.6 Body Diode Forward Voltage Variation with Source Current and Temperature

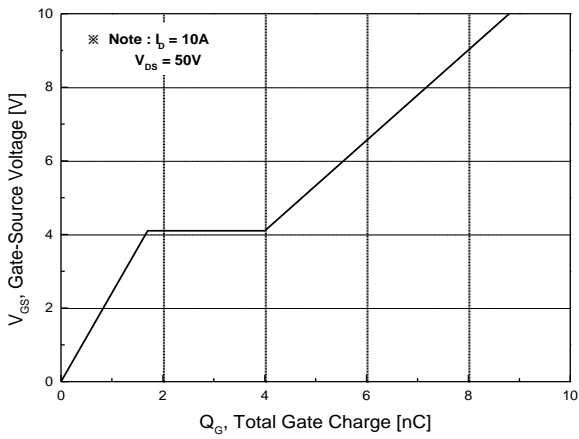


Fig.7 Gate Charge Characteristics

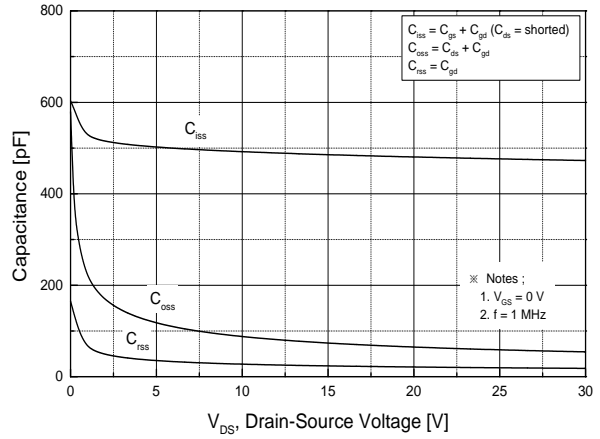


Fig.8 Capacitance Characteristics

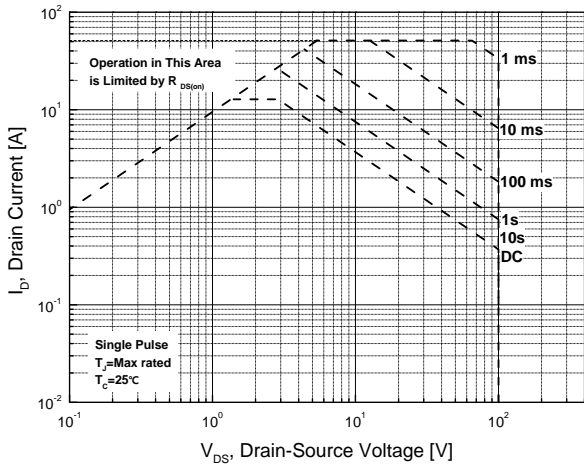


Fig.9 Maximum Safe Operating Area

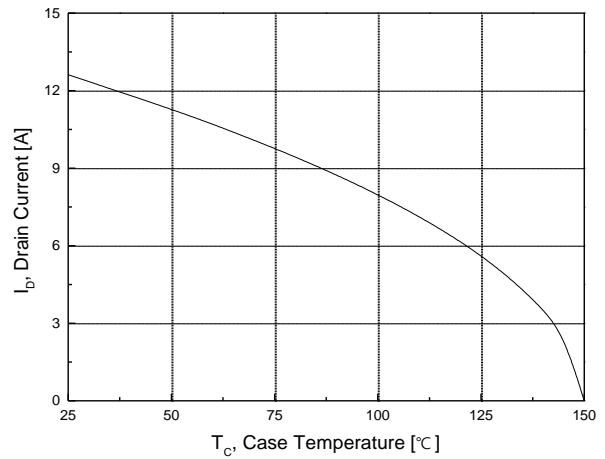


Fig.10 Maximum Drain Current vs. Case Temperature

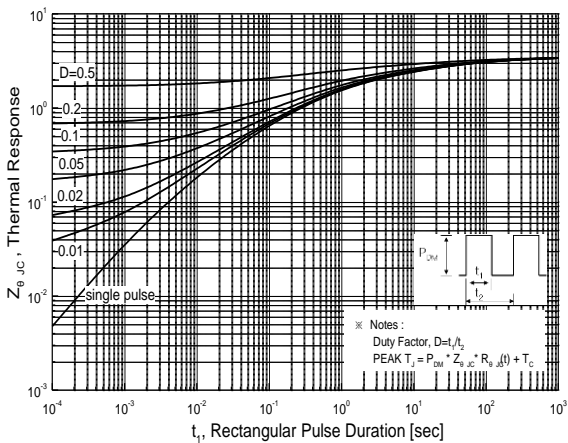
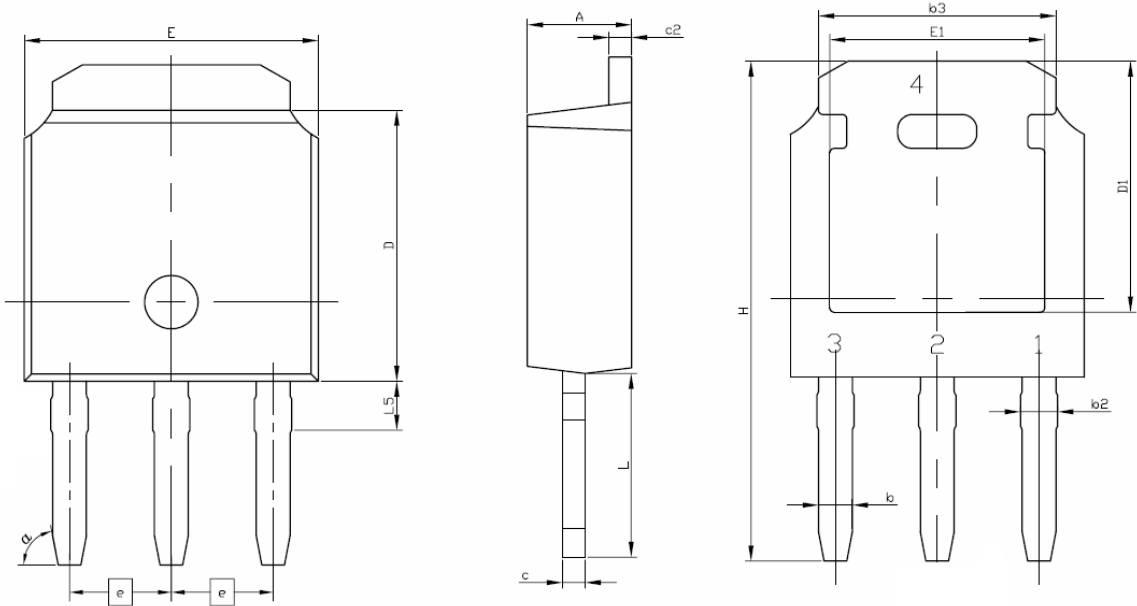


Fig.11 Transient Thermal Response Curve

Package Dimension

TO-251-VS (IPAK)

Dimensions are in millimeters, unless otherwise specified




Symbol	MILLIMETERS	
	Minimum	Maximum
A	2.18	2.39
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
L5	-	1.23

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

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