RoHS Compliant

MagnaChip

MDV1548

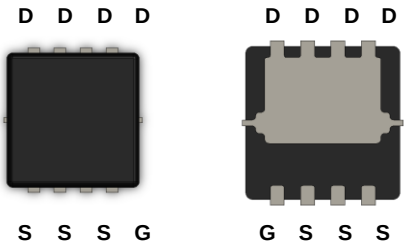
Single N-channel Trench MOSFET 30V

General Description

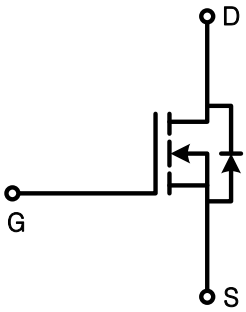
The MDV1548 uses advanced MagnaChip's MOSFET Technology, which provides high performance in on-state resistance, fast switching performance and excellent quality. MDV1548 is suitable device for DC/DC Converter and general purpose applications.

Features

- V_{DS} = 30V
- I_D = 28 A @V_{GS} = 10V
- $R_{DS(ON)}$
  < 18.8 mΩ @V_{GS} = 10V
  < 27.8 mΩ @V_{GS} = 4.5V
- 100% UIL Tested
- 100% Rg Tested



PDFN33



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°C	I_D	28	A
	T_C=70°C		22	
	T_A=25°C		10.7	
	T_A=70°C		8.6	
Pulsed Drain Current		I_{DM}	110	
Power Dissipation	T_C=25°C	P_D	22.7	W
	T_C=70°C		14.5	
	T_A=25°C		3.4	
	T_A=70°C		2.2	
Single Pulse Avalanche Energy [2]		E_{AS}	20	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]	$R_{\theta JA}$	36	°C/W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	5.5	

Ordering Information

Part Number	Temp. Range	Package	Packing	RoHS Status
MDV1548URH	-55~150°C	PDFN33	Tape & Reel	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	-	-	1	uA
Gate Leakage Current	I_{GSS}	V_{GS} = ±20V, V_{DS} = 0V	-	-	±100	nA
Drain-Source ON Resistance	$R_{DS(ON)}$	V_{GS} = 10V, I_D = 8A	-	16.3	18.8	mΩ
		T_J=125°C		23.6	27.3	
		V_{GS} = 4.5V, I_D = 6A	-	23.2	27.8	
Forward Transconductance	g_{fs}	V_{DS} = 5V, I_D = 8A	-	23		S
Dynamic Characteristics						
Total Gate Charge	$Q_{g(10V)}$	V_{DD} = 15V, I_D = 8A, V_{GS} = 10V	4.5	6.4	8.3	nC
Total Gate Charge	$Q_{g(4.5V)}$		2.0	2.9	3.8	
Gate-Source Charge	Q_{gs}			1.7		
Gate-Drain Charge	Q_{gd}		-	0.7	-	
Input Capacitance	C_{iss}	V_{DS} = 15V, V_{GS} = 0V, f = 1.0MHz	283	405	526	pF
Reverse Transfer Capacitance	C_{rss}		13	19	25	
Output Capacitance	C_{oss}		105	152	197	
Turn-On Delay Time	$t_{d(on)}$	V_{GS} = 10V, V_{DD} = 15.0V, I_D = 8A, R_G =3.0Ω,	-	5.4	-	ns
Rise Time	t_r		-	10.6	-	
Turn-Off Delay Time	$t_{d(off)}$		-	12.7	-	
Fall Time	t_f		-	3.2	-	
Gate Resistance	R_g	f=1 MHz	1.0	3.2	4.5	Ω
Drain-Source Body Diode Characteristics						
Source-Drain Diode Forward Voltage	V_{SD}	I_S = 1A, V_{GS} = 0V	-	0.85	1.1	V
Body Diode Reverse Recovery Time	t_{rr}	I_F = 8A, dI/dt = 100A/μs	-	19.5	-	ns
Body Diode Reverse Recovery Charge	Q_{rr}		-	13.1	-	nC

Note :

1. Surface mounted FR-4 board by JEDEC (jesd51-7). Continuous current at T_C=25℃ is silicon limited
2. E_{AS} is tested at starting T_j = 25℃, L = 0.1mH, I_{AS} = 10A, V_{DD} = 27V, V_{GS} = 10V

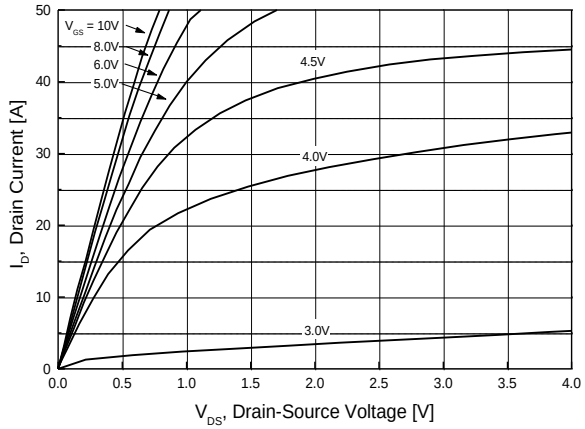


Fig.1 On-Region Characteristics

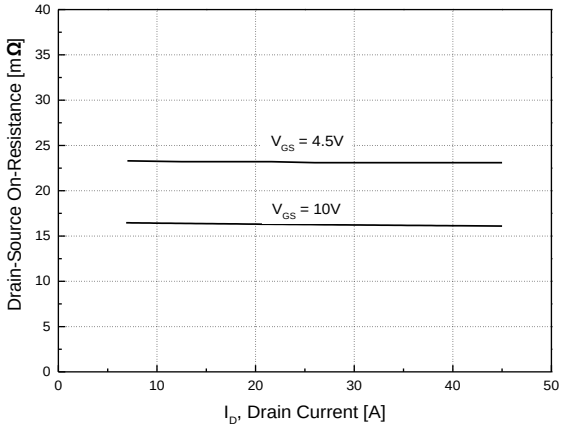


Fig.2 On-Resistance Variation with Drain Current and Gate Voltage

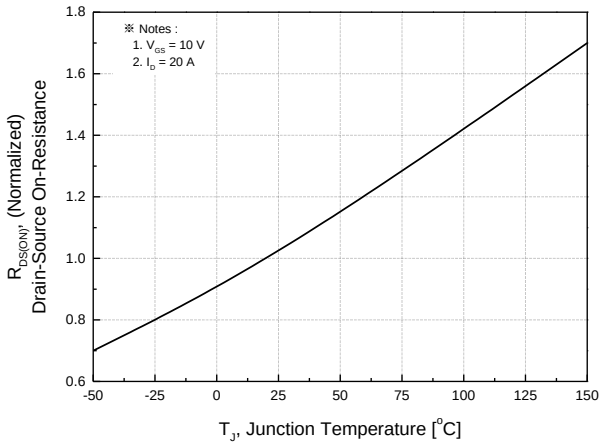


Fig.3 On-Resistance Variation with Temperature

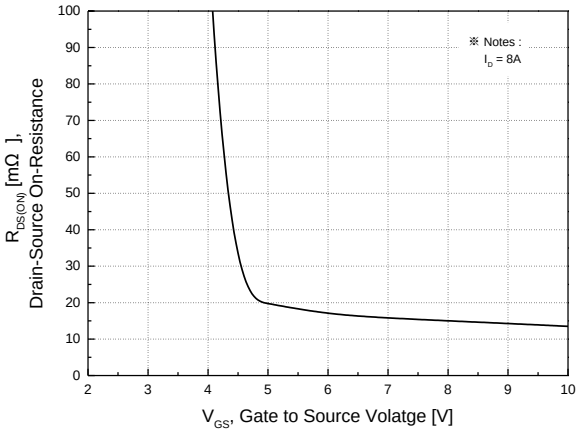


Fig.4 On-Resistance Variation with Gate to Source Voltage

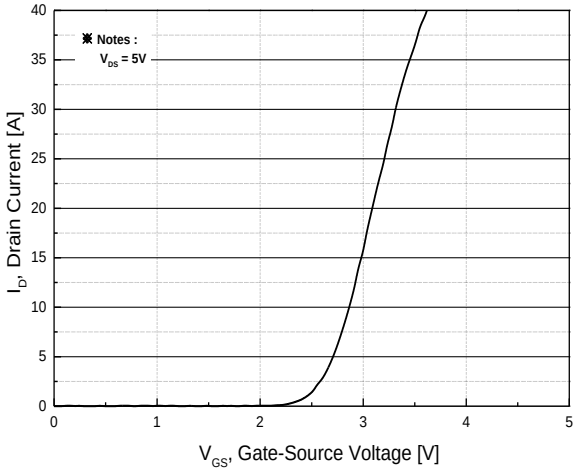


Fig.5 Transfer Characteristics

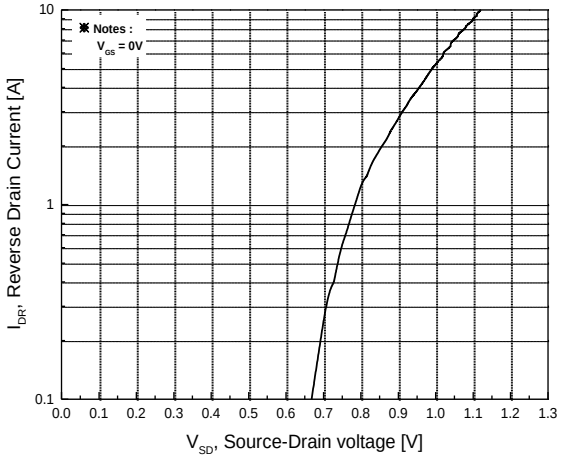


Fig.6 Body Diode Forward Voltage Variation with Source Current and Temperature

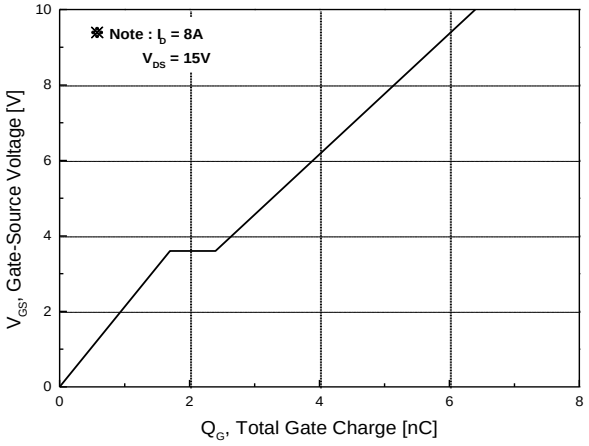


Fig.7 Gate Charge Characteristics

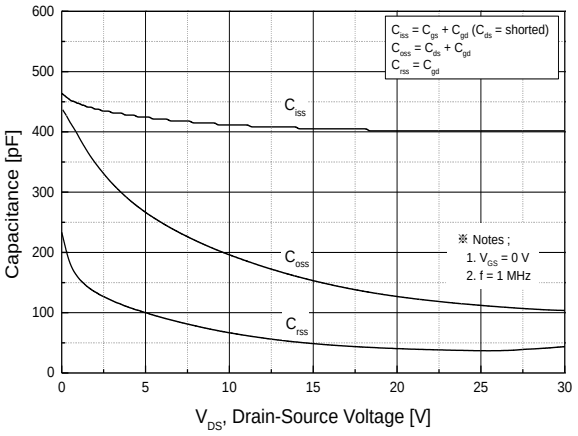


Fig.8 Capacitance Characteristics

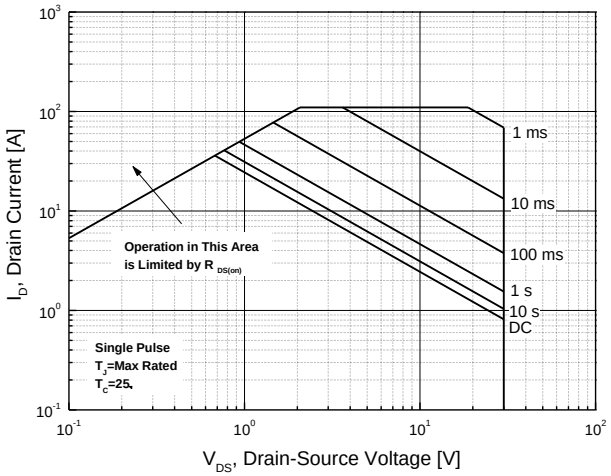


Fig.9 Maximum Safe Operating Area

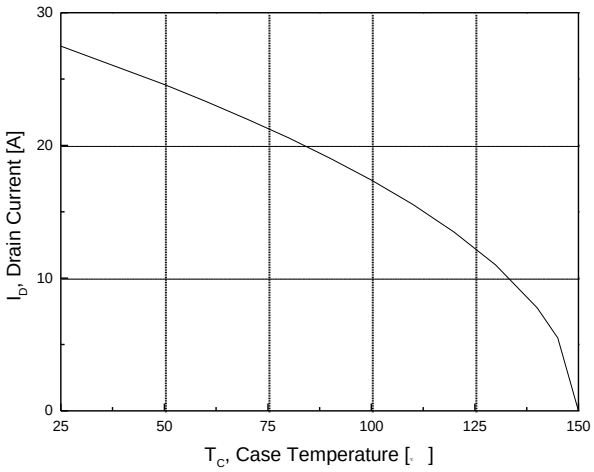


Fig.10 Maximum Drain Current vs. Case Temperature

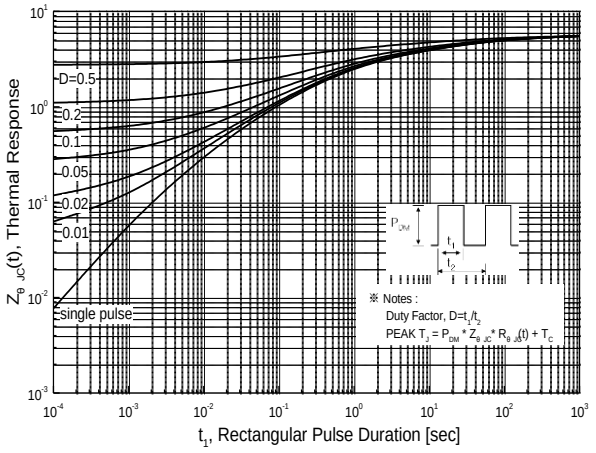
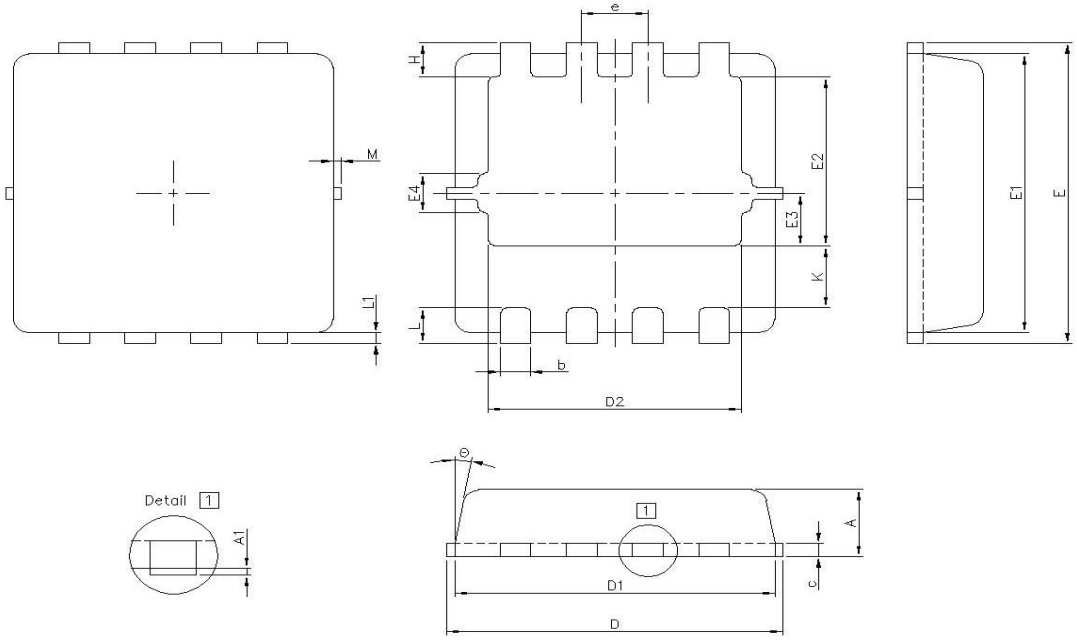


Fig.11 Transient Thermal Response Curve

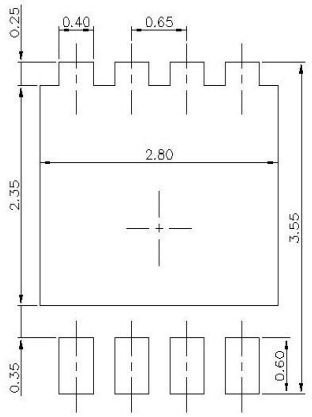
Package Dimension

PowerDFN33 (3.3x3.3mm)

Dimensions are in millimeters, unless otherwise specified



Land Pattern
(Only for Reference)



(Unit: mm)

DIM	Min	Max	DIM	Min	Max
A	0.70	0.80	E2	1.78	1.98
A1	0.00	0.05	E3	0.49	0.69
b	0.25	0.35	E4	0.35 TYP.	
c	0.10	0.25	e	0.65 BSC	
D	3.20	3.40	K	0.70 TYP.	
D1	3.00	3.20	L	0.30	0.50
D2	2.39	2.59	L1	0.13 TYP.	
E	3.25	3.45	H	0.27	0.47
E1	3.00	3.20	Θ	0	12

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.