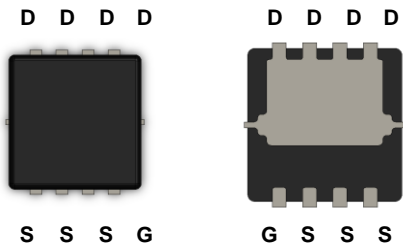


General Description

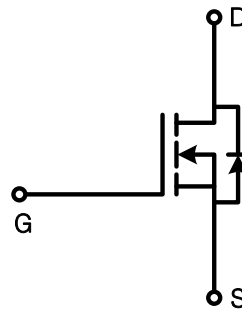
The MDV1542 uses advanced MagnaChip's MOSFET Technology, which provides high performance in on-state resistance, fast switching performance and excellent quality. MDV1542 is suitable device for DC/DC Converter and general purpose applications.

Features

- $V_{DS} = 30V$
- $I_D = 32 A @ V_{GS} = 10V$
- $R_{DS(ON)} < 4.9 m\Omega @ V_{GS} = 10V$
 $< 6.8 m\Omega @ V_{GS} = 4.5V$
- 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⁾	$T_C=25^\circ C$ (Silicon Limited)	I_D	58	A
	$T_C=25^\circ C$ (Package Limited)		32	
	$T_C=70^\circ C$		47	
	$T_A=25^\circ C$		21	
	$T_A=70^\circ C$		16	
Pulsed Drain Current		I_{DM}	120	
Power Dissipation	$T_C=25^\circ C$	P_D	27	W
	$T_C=70^\circ C$		17	
	$T_A=25^\circ C$		3.5	
	$T_A=70^\circ C$		2.2	
Single Pulse Avalanche Energy ⁽²⁾		E_{AS}	97	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	$R_{\theta JC}$	4.6	

Ordering Information

Part Number	Temp. Range	Package	Packing	RoHS Status
MDV1542URH	-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	μA
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 = 16A	-	4.3	4.9	mΩ
		T _J = 125°C	-	6.2	7.1	
Forward Transconductance	g _{fs}	V _{GS} = 4.5V, I _D = 13A	-	11	-	S
Dynamic Characteristics						
Total Gate Charge	Q _{g(10V)}	V _{DD} = 15V, I _D = 16A, V _{GS} = 10V	19	27	35	nC
Total Gate Charge	Q _{g(4.5V)}		8.3	12	15	
Gate-Source Charge	Q _{gs}		-	6.3	-	
Gate-Drain Charge	Q _{gd}		-	1.8	-	
Input Capacitance	C _{iss}	V _{DS} = 15V, V _{GS} = 0V, f = 1.0MHz	1300	1870	2430	pF
Reverse Transfer Capacitance	C _{rss}		46	67	87	
Output Capacitance	C _{oss}		500	720	934	
Turn-On Delay Time	t _{d(on)}	V _{GS} = 10V, V _{DD} = 15.0V, I _D = 16A, R _G = 3Ω,	-	11.5	-	ns
Rise Time	t _r		-	11.6	-	
Turn-Off Delay Time	t _{d(off)}		-	32.2	-	
Fall Time	t _f		-	5.8	-	
Gate Resistance	R _g	f = 1 MHz	0.5	0.95	3.0	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	-	39.5	60	ns
Body Diode Reverse Recovery Charge	Q _{rr}		-	37.4	56	nC

Note :

- Surface mounted FR-4 board by JEDEC (jesd51-7). Continuous current at T_C = 25°C is silicon limited
- E_{AS} is tested at starting T_J = 25°C, L = 0.1mH, I_{AS} = 22A, V_{DD} = 27V, V_{GS} = 10V

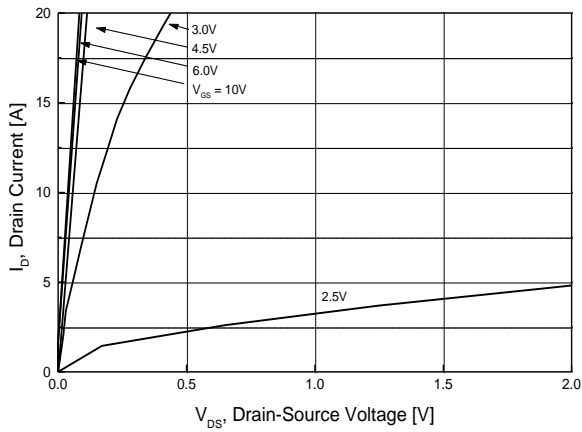


Fig.1 On-Region Characteristics

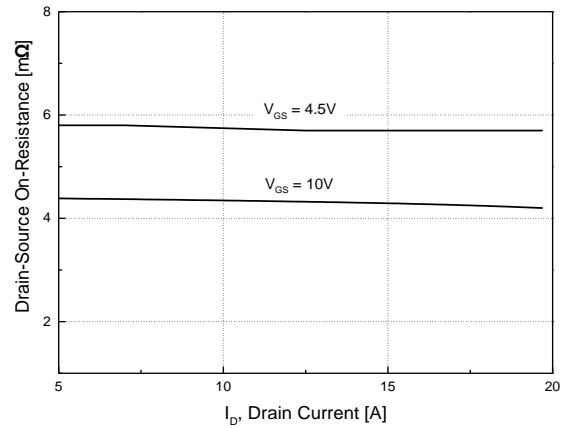


Fig.2 On-Resistance Variation with Drain Current and Gate Voltage

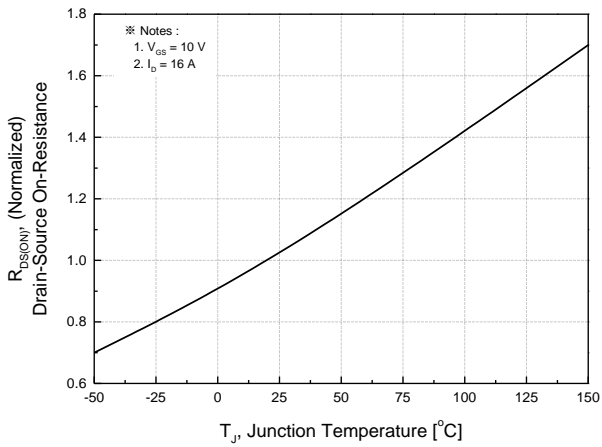


Fig.3 On-Resistance Variation with Temperature

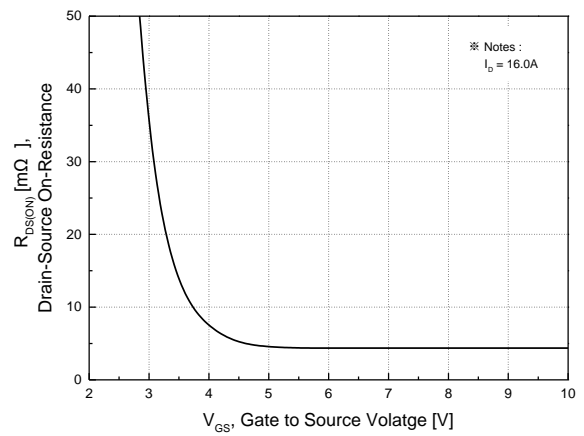


Fig.4 On-Resistance Variation with Gate to Source Voltage

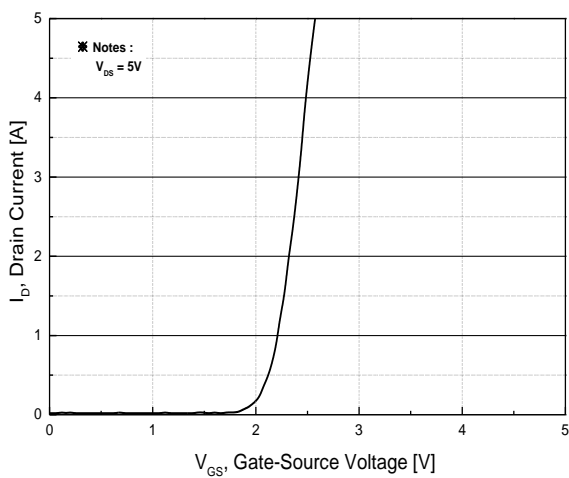


Fig.5 Transfer Characteristics

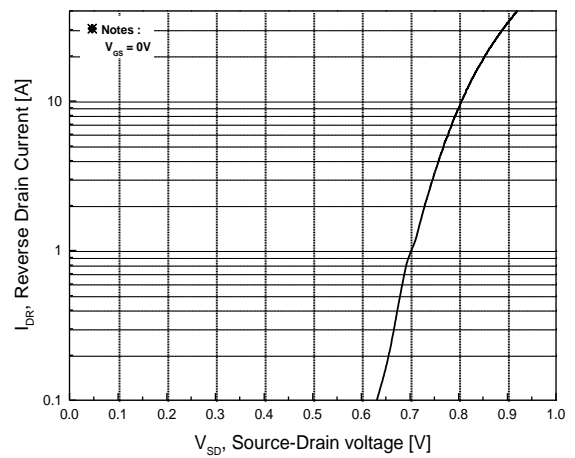


Fig.6 Body Diode Forward Voltage Variation with Source Current and Temperature

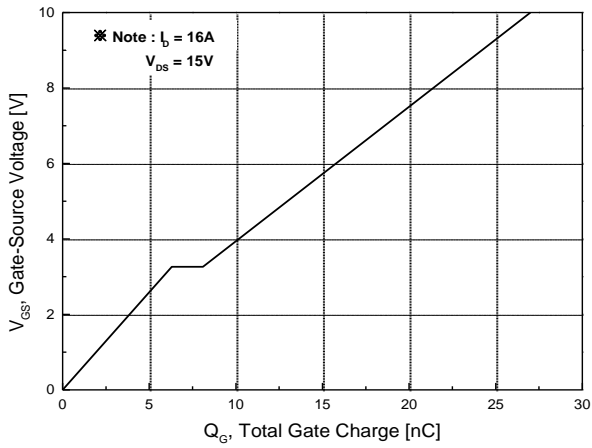


Fig.7 Gate Charge Characteristics

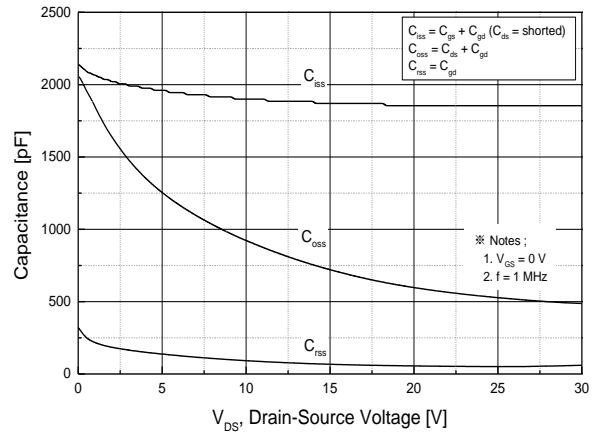


Fig.8 Capacitance Characteristics

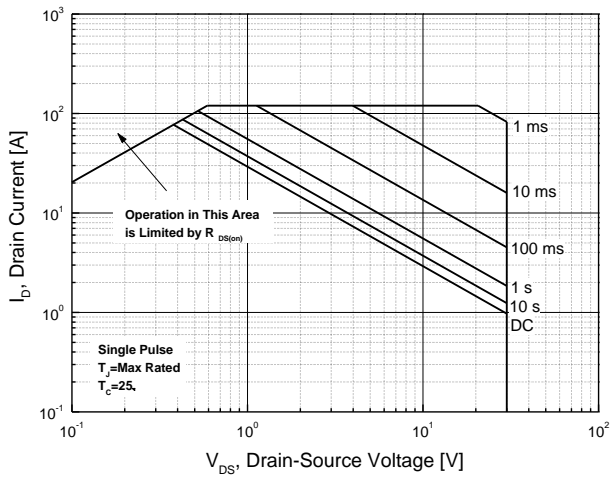


Fig.9 Maximum Safe Operating Area

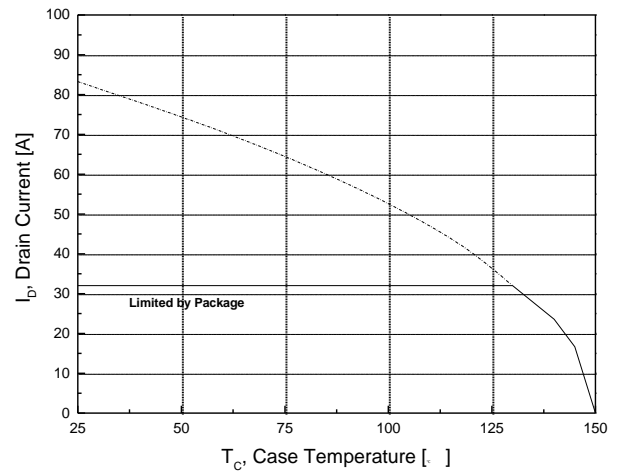


Fig.10 Maximum Drain Current vs. Case Temperature

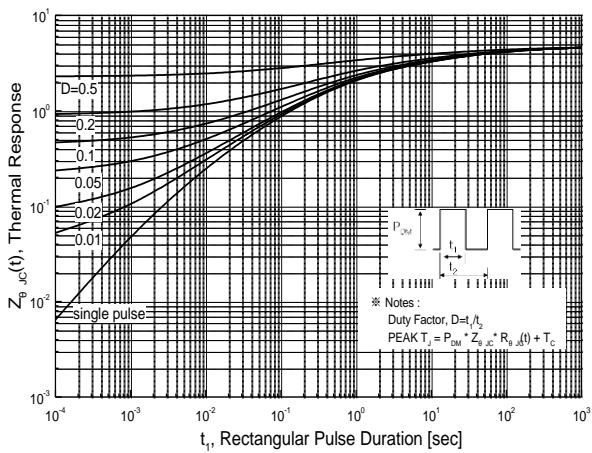
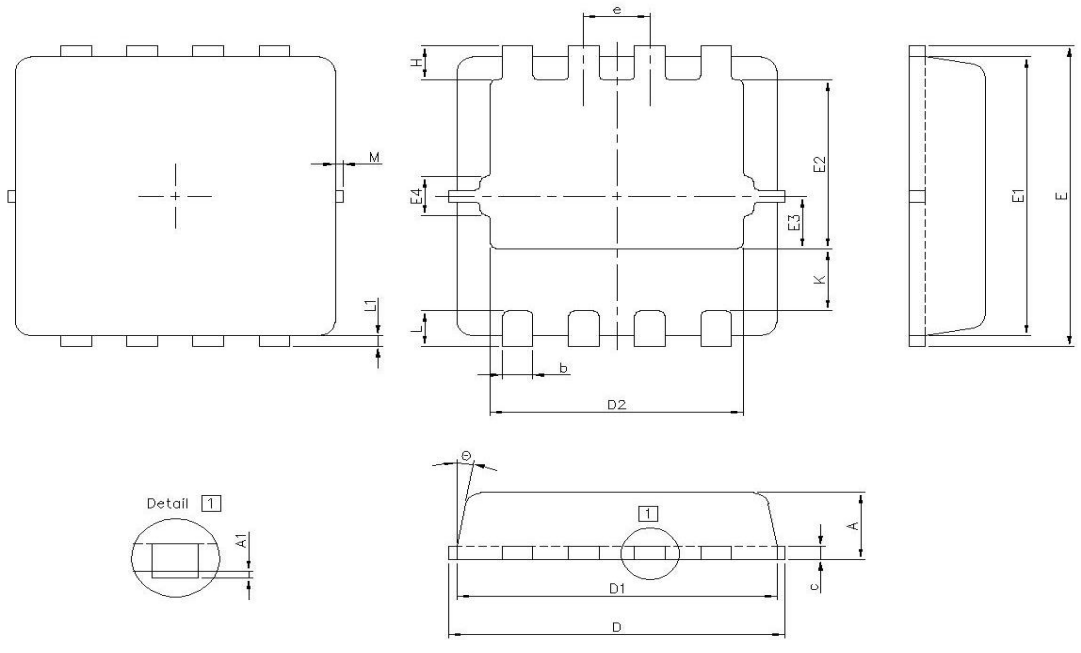


Fig.11 Transient Thermal Response Curve

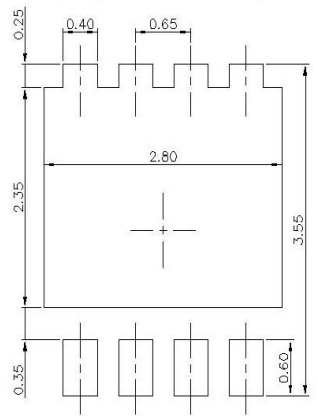
Package Dimension

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

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