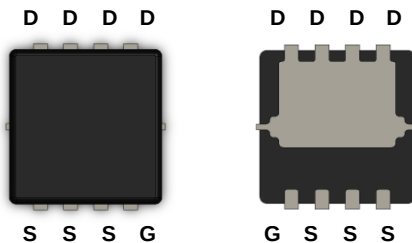


General Description

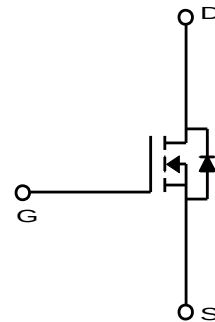
The MDV1524 uses advanced Magnachip's MOSFET Technology, which provides high performance in on-state resistance, fast switching performance and excellent quality. MDV1524 is suitable for DC/DC converter and general purpose applications.

Features

- $V_{DS} = 30V$
- $I_D = 24A$ @ $V_{GS} = 10V$
- $R_{DS(ON)} < 8.1m\Omega$ @ $V_{GS} = 10V$
 $< 11.6m\Omega$ @ $V_{GS} = 4.5V$
- 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	42.4	A
	$T_C=25^\circ C$ (Package limited)		24	
	$T_C=70^\circ C$		24	
	$T_A=25^\circ C$		15.4 ⁽³⁾	
	$T_A=70^\circ C$		12.4 ⁽³⁾	
Pulsed Drain Current		I_{DM}	60	A
Power Dissipation	$T_C=25^\circ C$	P_D	25.2	W
	$T_C=70^\circ C$		16.3	
	$T_A=25^\circ C$		3.4 ⁽³⁾	
	$T_A=70^\circ C$		2.2 ⁽³⁾	
Single Pulse Avalanche Energy ⁽²⁾		E_{AS}	60	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	$R_{\theta JC}$	4.9	

Ordering Information

Part Number	Temp. Range	Package	Packing	Quantity	RoHS Status
MDV1524URH	-55~150°C	PowerDFN33	Tape & Reel	5000 units	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
		T _J =55°C	-	-	5	
Gate Leakage Current	I _{GSS}	V _{GS} = ±20V, V _{DS} = 0V	-	-	±0.1	mΩ
Drain-Source ON Resistance	R _{DS(on)}	V _{GS} = 10V, I _D = 12A	-	7.0	8.1	
		T _J =125°C	-	10.2	11.7	
		V _{GS} = 4.5V, I _D = 10A	-	9.7	11.6	
Forward Transconductance	g _{fs}	V _{DS} = 5V, I _D = 12A	-	19	-	S
Dynamic Characteristics						
Total Gate Charge	Q _{g(10V)}	V _{DS} = 15.0V, I _D = 12A, V _{GS} = 10V	11.1	15.9	20.7	nC
Total Gate Charge	Q _{g(4.5V)}		5.3	7.6	9.8	
Gate-Source Charge	Q _{gs}		-	3.1	-	
Gate-Drain Charge	Q _{gd}		-	2.8	-	
Input Capacitance	C _{iss}	V _{DS} = 15.0V, V _{GS} = 0V, f = 1.0MHz	714	1019	1325	pF
Reverse Transfer Capacitance	C _{rss}		71	101	131	
Output Capacitance	C _{oss}		143	204	266	
Turn-On Delay Time	t _{d(on)}	V _{GS} = 10V, V _{DS} = 15.0V, I _D = 12A, R _G = 3.0Ω	-	7.5	-	ns
Rise Time	t _r		-	17.9	-	
Turn-Off Delay Time	t _{d(off)}		-	25.1	-	
Fall Time	t _f		-	5.9	-	
Gate Resistance	R _g	f=1 MHz	0.5	1.1	3.0	Ω
Drain-Source Body Diode Characteristics						
Source-Drain Diode Forward Voltage	V _{SD}	I _S = 12A, V _{GS} = 0V	-	0.82	1.1	V
Body Diode Reverse Recovery Time	t _{rr}	I _F = 12A, di/dt = 100A/μs	-	20.7	31.1	ns
Body Diode Reverse Recovery Charge	Q _{rr}		-	11.5	17.2	nC

Note :

1. Surface mounted FR-4 board by JEDEC (jesd51-7)
2. E_{AS} is tested at starting T_J = 25°C, L = 0.1mH, I_{AS} = 19.2A, V_{DD} = 27V, V_{GS} = 10V
3. T < 10sec.

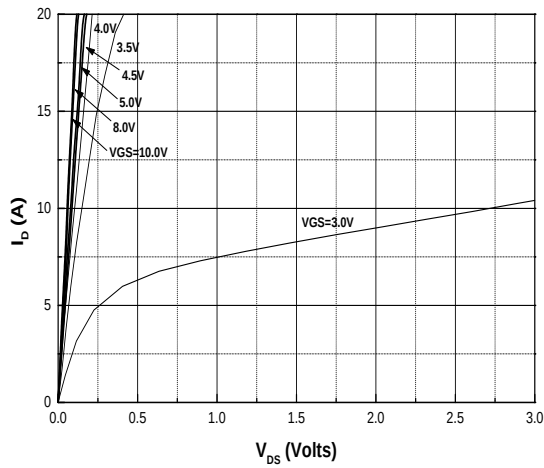


Fig.1 On-Region Characteristics

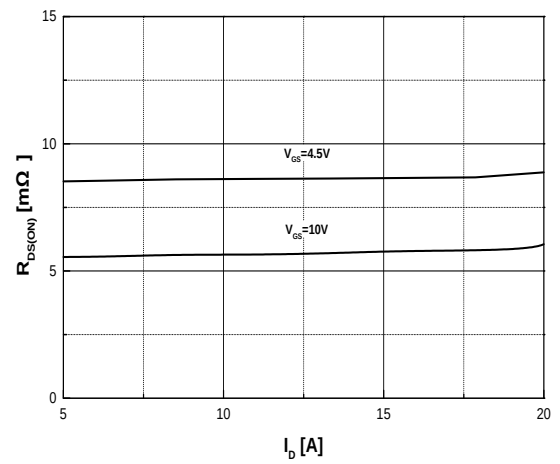


Fig.2 On-Resistance Variation with Drain Current and Gate Voltage

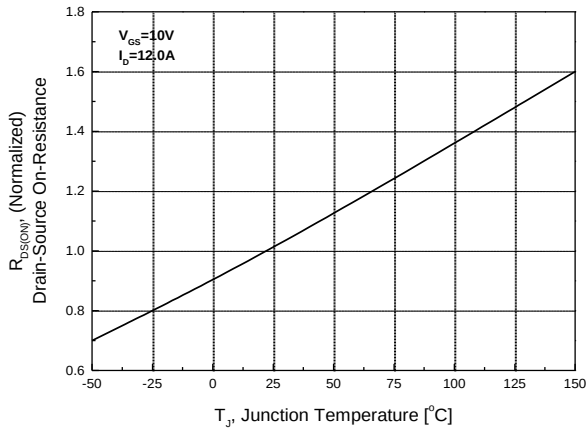


Fig.3 On-Resistance Variation with Temperature

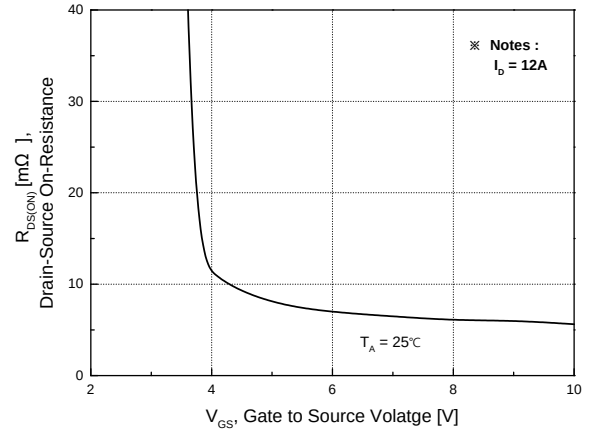


Fig.4 On-Resistance Variation with Gate to Source Voltage

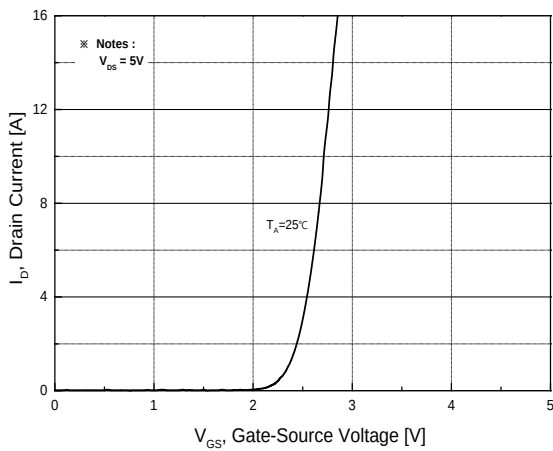


Fig.5 Transfer Characteristics

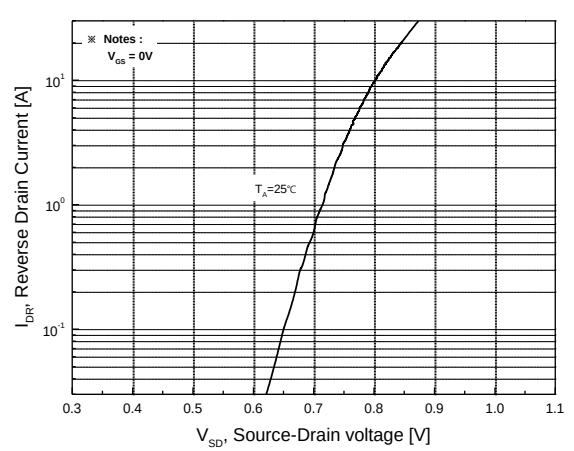


Fig.6 Body Diode Forward Voltage Variation with Source Current and Temperature

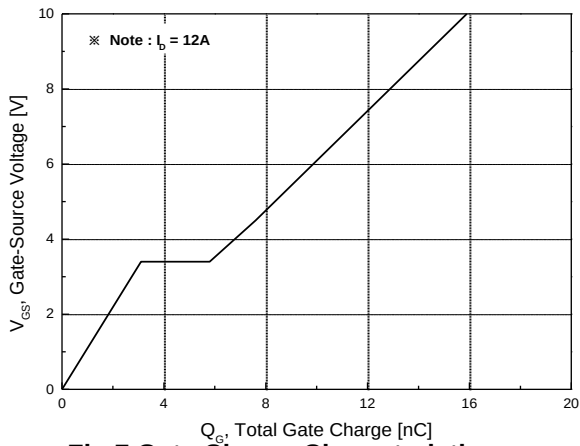


Fig.7 Gate Charge Characteristics

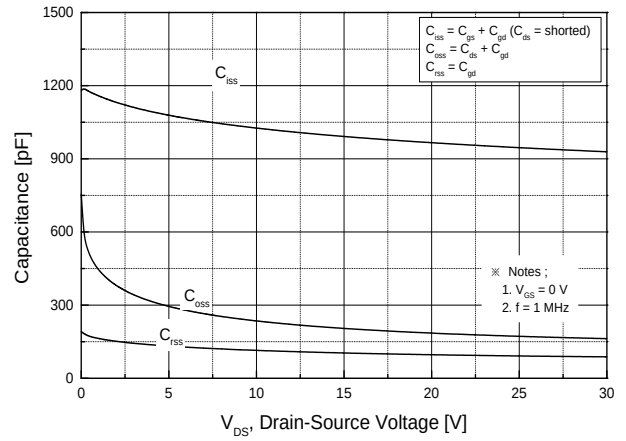


Fig.8 Capacitance Characteristics

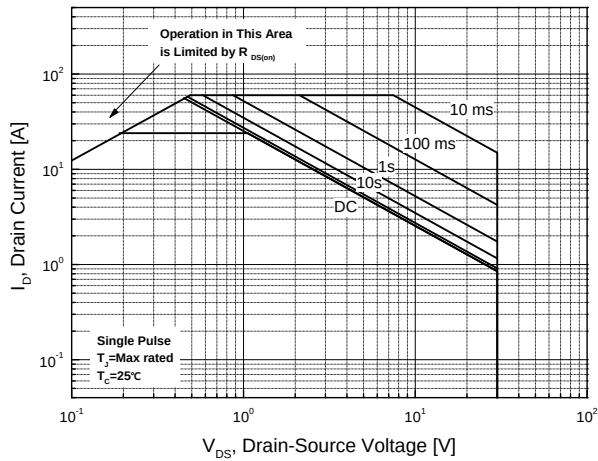


Fig.9 Maximum Safe Operating Area

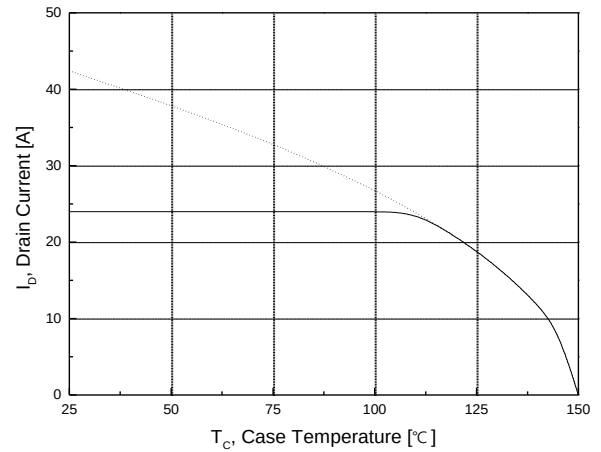


Fig.10 Maximum Drain Current vs. Case Temperature

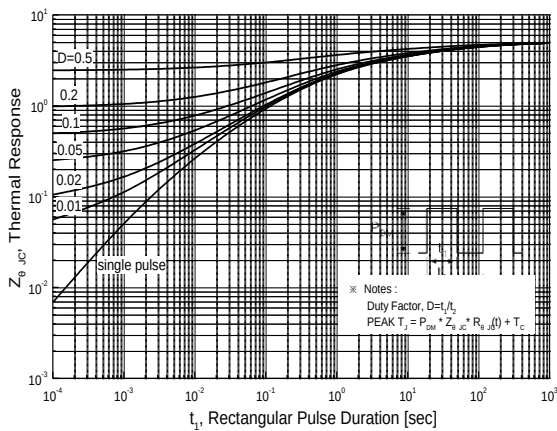
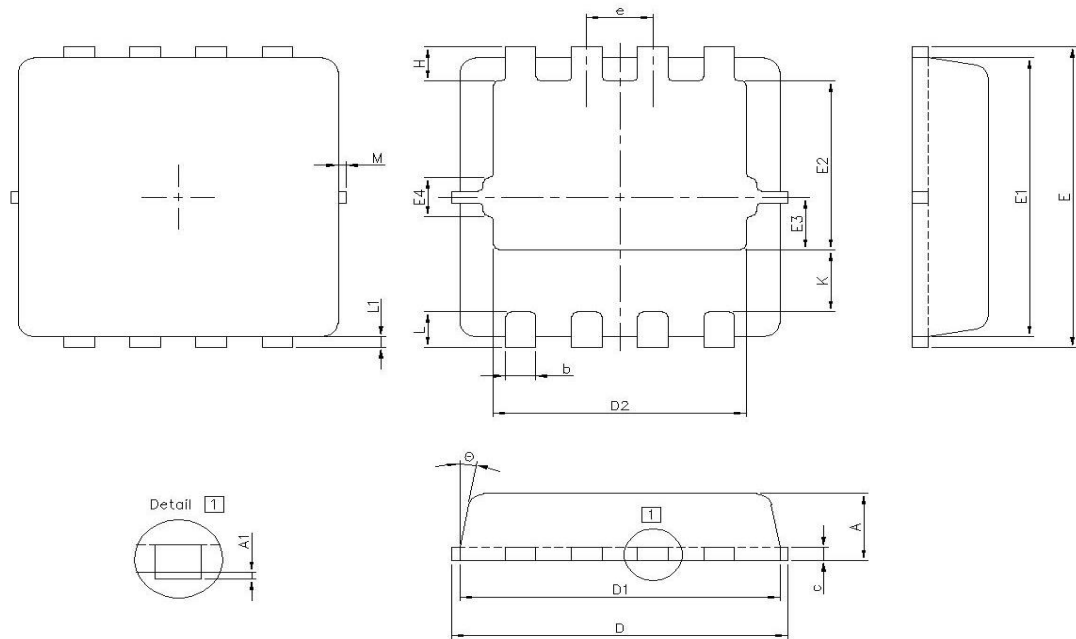


Fig.11 Transient Thermal Response Curve

Package Dimension

PowerDFN33 (3.3x3.3mm)

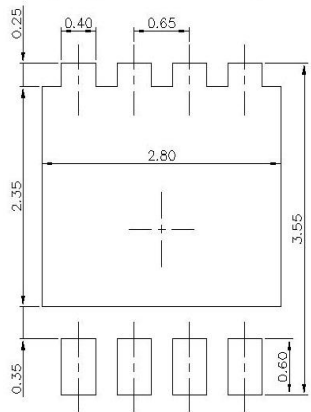
Dimensions are in millimeters, unless otherwise specified



(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

Land Pattern
(Only for Reference)



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

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