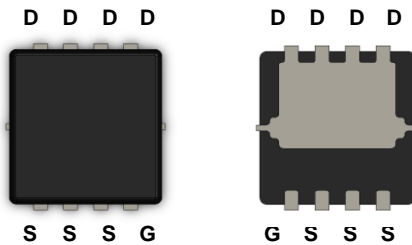


General Description

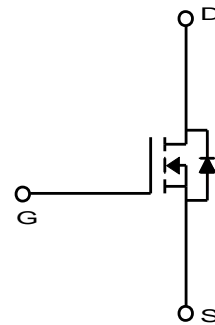
The MDV1522 uses advanced Magnachip's MOSFET Technology, which provides high performance in on-state resistance, fast switching performance and excellent quality. MDV1522 is suitable for DC/DC converter and general purpose applications.

Features

- $V_{DS} = 30V$
- $I_D = 28A @ V_{GS} = 10V$
- $R_{DS(ON)} < 4.9m\Omega @ V_{GS} = 10V$
 $< 6.8m\Omega @ V_{GS} = 4.5V$
- 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	56.8	A
	$T_C=25^\circ C$ (Package limited)		28	
	$T_C=70^\circ C$		28	
	$T_A=25^\circ C$		19.9 ⁽³⁾	
	$T_A=70^\circ C$		16.0 ⁽³⁾	
Pulsed Drain Current		I_{DM}	60	A
Power Dissipation	$T_C=25^\circ C$	P_D	27.7	W
	$T_C=70^\circ C$		17.7	
	$T_A=25^\circ C$		3.4 ⁽³⁾	
	$T_A=70^\circ C$		2.2 ⁽³⁾	
Single Pulse Avalanche Energy ⁽²⁾		E_{AS}	136	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	$R_{\theta JC}$	4.5	

Ordering Information

Part Number	Temp. Range	Package	Packing	Quantity	Rohs Status
MDV1522URH	-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}	$I_D = 250\mu A, V_{GS} = 0V$	30	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	1.3	1.9	2.7	
Drain Cut-Off Current	I_{DSS}	$V_{DS} = 30V, V_{GS} = 0V$	-	-	1	μA
		$T_J = 55^\circ C$	-	-	5	
Gate Leakage Current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$	-	-	± 0.1	
Drain-Source ON Resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 16A$	-	4.3	4.9	m Ω
		$T_J = 125^\circ C$	-	6.2	7.1	
		$V_{GS} = 4.5V, I_D = 13A$	-	5.7	6.8	
Forward Transconductance	g_{fs}	$V_{DS} = 5V, I_D = 16A$	-	-	-	S
Dynamic Characteristics						
Total Gate Charge	$Q_{g(10V)}$	$V_{DS} = 15.0V, I_D = 16A, V_{GS} = 10V$	20.5	29.4	38.2	nC
Total Gate Charge	$Q_{g(4.5V)}$		10.0	14.3	18.6	
Gate-Source Charge	Q_{gs}		-	5.6	-	
Gate-Drain Charge	Q_{gd}		-	4.7	-	
Input Capacitance	C_{iss}	$V_{DS} = 15.0V, V_{GS} = 0V, f = 1.0MHz$	1295	1850	2404	pF
Reverse Transfer Capacitance	C_{rss}		131	188	244	
Output Capacitance	C_{oss}		260	372	483	
Turn-On Delay Time	$t_{d(on)}$	$V_{GS} = 10V, V_{DS} = 15.0V, I_D = 16A, R_G = 3.0\Omega$	-	10.5	-	ns
Rise Time	t_r		-	11.3	-	
Turn-Off Delay Time	$t_{d(off)}$		-	38.2	-	
Fall Time	t_f		-	10.0	-	
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}	$I_S = 16A, V_{GS} = 0V$	-	0.80	1.1	V
Body Diode Reverse Recovery Time	t_{rr}	$I_F = 16A, di/dt = 100A/\mu s$	-	29.3	44.0	ns
Body Diode Reverse Recovery Charge	Q_{rr}		-	20.3	30.4	nC

Note :

1. Surface mounted FR-4 board by JEDEC (jesd51-7)
2. E_{AS} is tested at starting $T_J = 25^\circ C$, $L = 0.1mH$, $I_{AS} = 30.4A$, $V_{DD} = 27V$, $V_{GS} = 10V$.
3. $T < 10sec$.

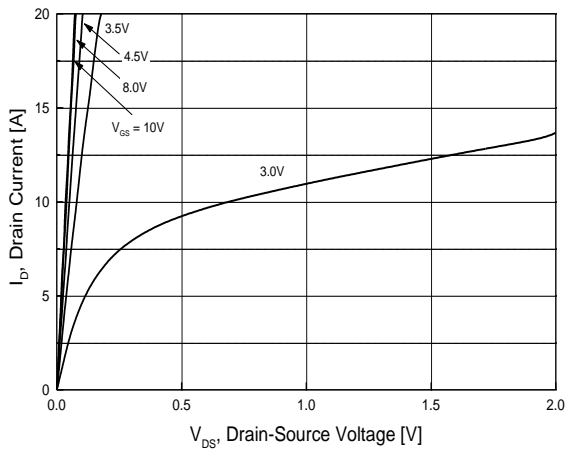


Fig.1 On-Region Characteristics

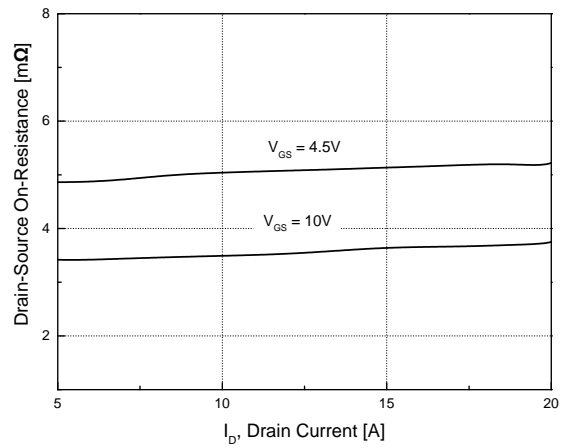


Fig.2 On-Resistance Variation with Drain Current and Gate Voltage

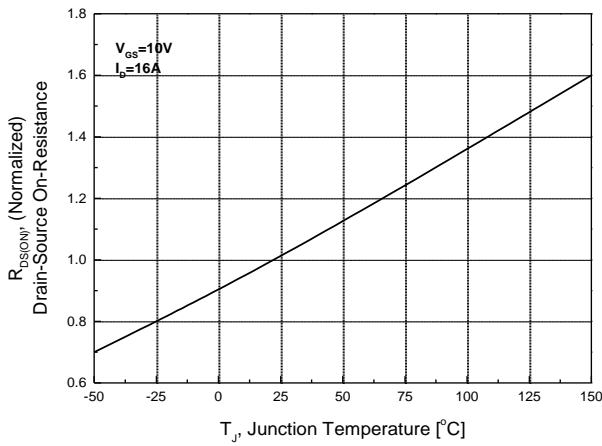


Fig.3 On-Resistance Variation with Temperature

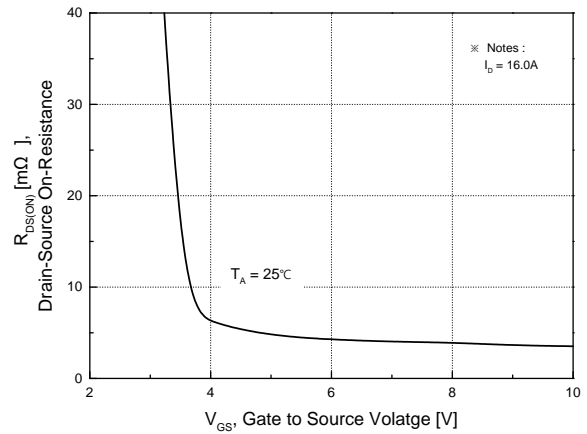


Fig.4 On-Resistance Variation with Gate to Source Voltage

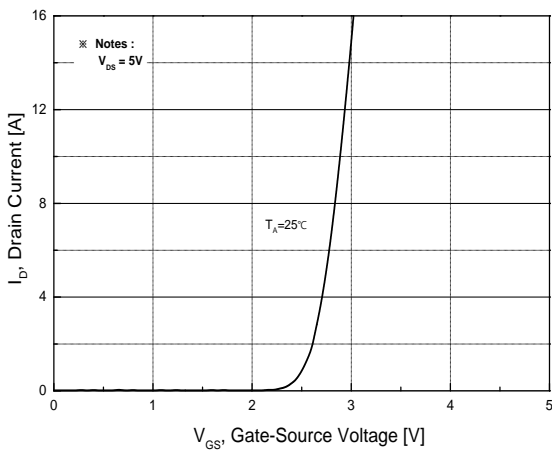


Fig.5 Transfer Characteristics

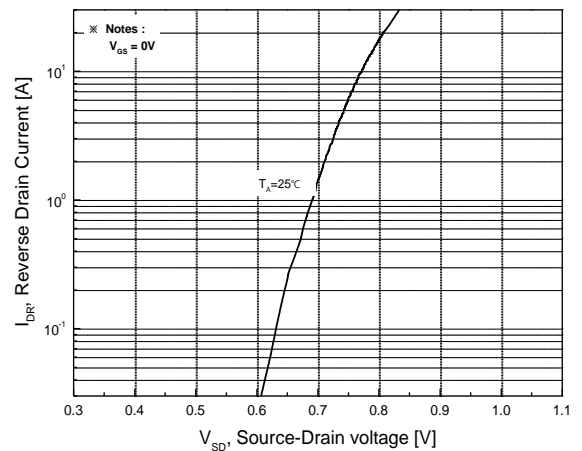


Fig.6 Body Diode Forward Voltage Variation with Source Current and Temperature

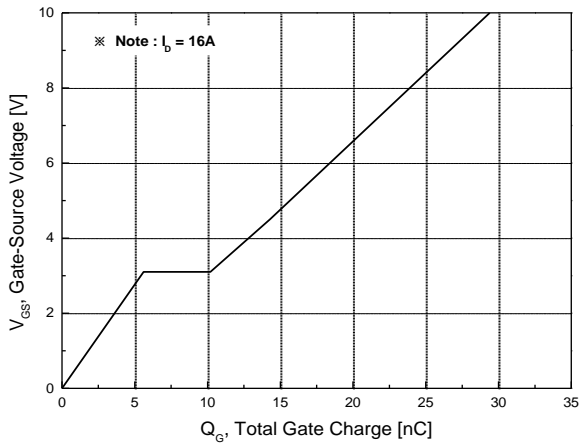


Fig.7 Gate Charge Characteristics

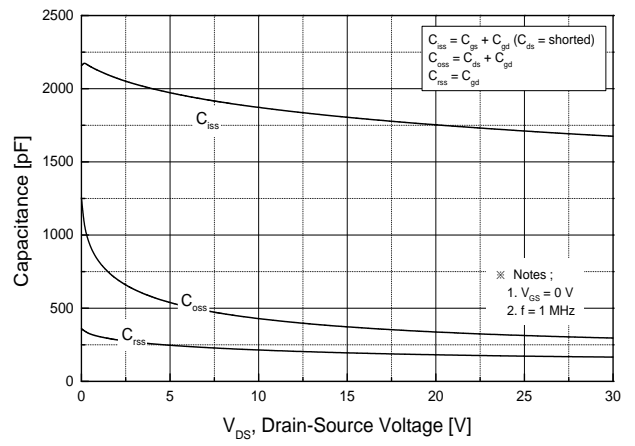


Fig.8 Capacitance Characteristics

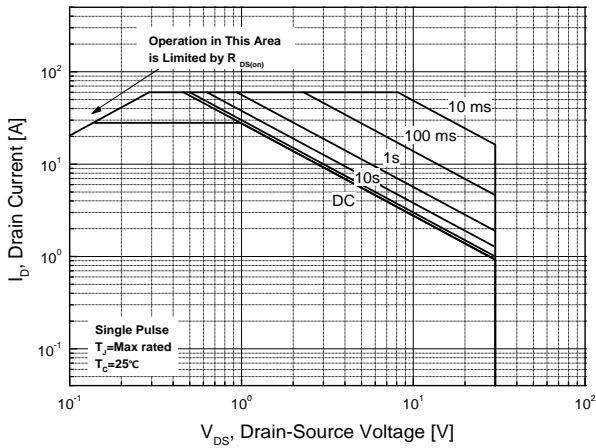


Fig.9 Maximum Safe Operating Area

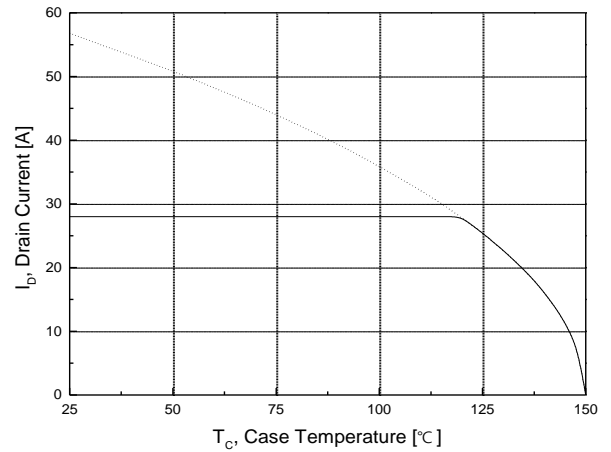


Fig.10 Maximum Drain Current vs. Case Temperature

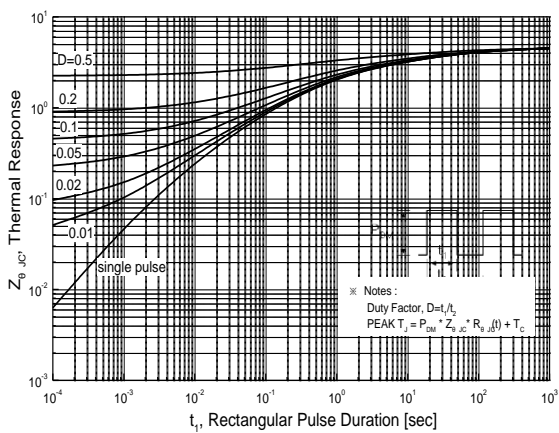
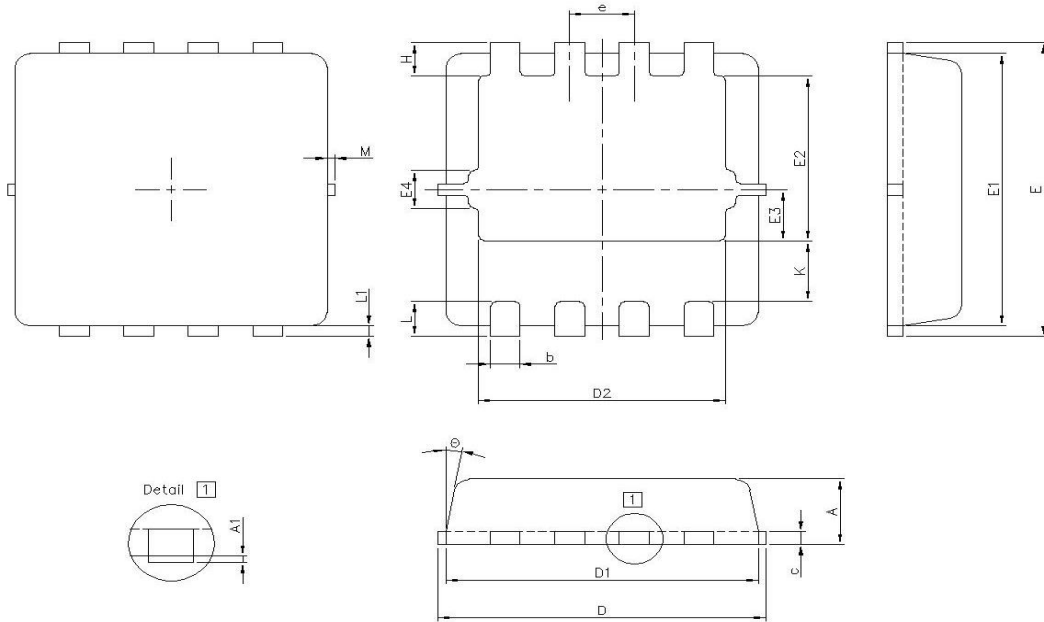


Fig.11 Transient Thermal Response Curve

Package Dimension

PowerDFN33 (3.3x3.3mm)

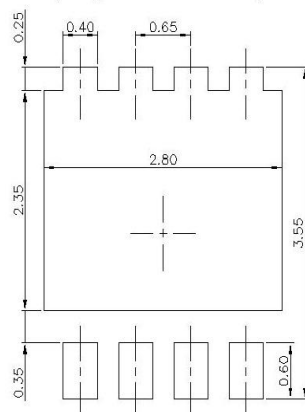
Dimensions are in millimeters, unless otherwise specified



(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	⊖	0	12


Land Pattern
(Only for Reference)



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

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.

Magnachip reserves the right to change the specifications and circuitry without notice at any time. Magnachip does not consider responsibility for use of any circuitry other than circuitry entirely included in a Magnachip product.  Magnachip is a registered trademark of Magnachip Semiconductor Ltd.