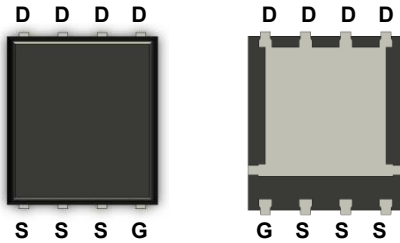


### General Description

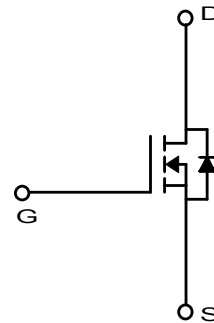
The MDU1517 uses advanced MagnaChip's MOSFET Technology, which provides high performance in on-state resistance, fast switching performance and excellent quality. MDU1517 is suitable device for DC to DC converter and general purpose applications.

### Features

- $V_{DS} = 30V$
- $I_D = 100.0A @ V_{GS} = 10V$
- $R_{DS(ON)(MAX)} < 2.9m\Omega @ V_{GS} = 10V$
- $< 4.4m\Omega @ V_{GS} = 4.5V$
- 100% UIL Tested
- 100% Rg Tested



**PowerDFN56**



### 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 <sup>(1)</sup>	$T_C=25^\circ C$	$I_D$	100.0	A
	$T_C=70^\circ C$		96.0	
	$T_A=25^\circ C$		32.9 <sup>(3)</sup>	
	$T_A=70^\circ C$		26.2 <sup>(3)</sup>	
Pulsed Drain Current		$I_{DM}$	100	A
Power Dissipation	$T_C=25^\circ C$	$P_D$	73.5	W
	$T_C=70^\circ C$		47.0	
	$T_A=25^\circ C$		5.5 <sup>(3)</sup>	
	$T_A=70^\circ C$		3.5 <sup>(3)</sup>	
Single Pulse Avalanche Energy <sup>(2)</sup>		$E_{AS}$	187	mJ
Junction and Storage Temperature Range		$T_J, T_{stg}$	-55~150	°C

### Thermal Characteristics

Characteristics	Symbol	Rating	Unit
Thermal Resistance, Junction-to-Ambient <sup>(1)</sup>	$R_{\theta JA}$	22.7	°C/W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	1.7	

## Ordering Information

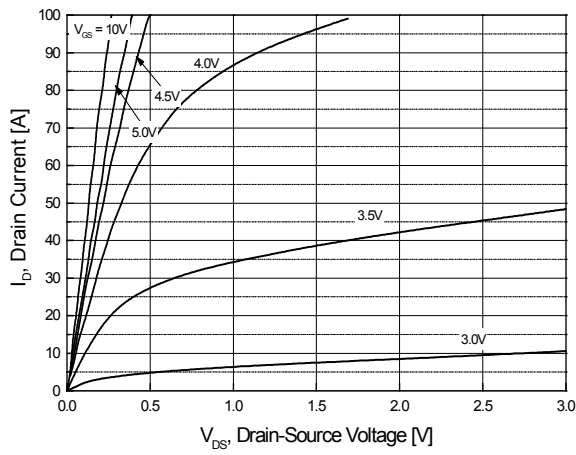
Part Number	Temp. Range	Package	Packing	Quantity	Rohs Status
MDU1517RH	-55~150°C	PowerDFN56	Tape & Reel	3000 units	Halogen Free

## Electrical Characteristics (T<sub>J</sub> =25°C)

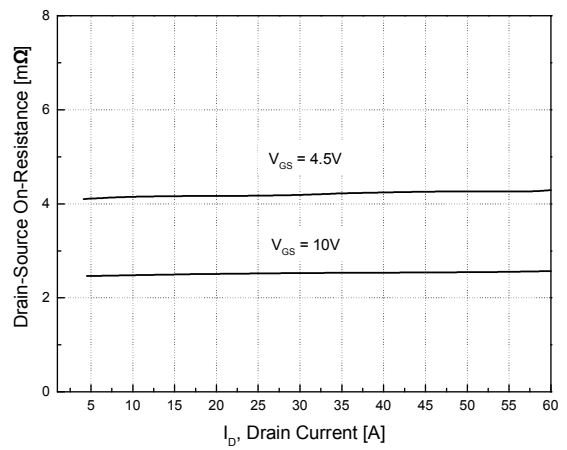
Characteristics	Symbol	Test Condition	Min	Typ	Max	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	$BV_{DS}$	$I_D = 250\mu A, V_{GS} = 0V$	30	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	1.3	1.9	2.7	
Drain Cut-Off Current	$I_{DSS}$	$V_{DS} = 30V, V_{GS} = 0V$ $T_J=55^\circ C$	-	-	1 5	$\mu A$
Gate Leakage Current	$I_{GSS}$	$V_{GS} = \pm 20V, V_{DS} = 0V$	-	-	$\pm 0.1$	
Drain-Source ON Resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 26A$ $T_J=125^\circ C$	-	2.5 3.6	2.9 4.2	m $\Omega$
		$V_{GS} = 4.5V, I_D = 21A$	-	3.7	4.4	
Forward Transconductance	$g_{fs}$	$V_{DS} = 5V, I_D = 10A$	-	46	-	S
<b>Dynamic Characteristics</b>						
Total Gate Charge	$Q_{g(10V)}$	$V_{DS} = 15.0V, I_D = 26A,$ $V_{GS} = 10V$	31.1	41.5	51.9	nC
Total Gate Charge	$Q_{g(4.5V)}$		14.9	19.8	24.8	
Gate-Source Charge	$Q_{gs}$		-	8.1	-	
Gate-Drain Charge	$Q_{gd}$		-	7.9	-	
Input Capacitance	$C_{iss}$	$V_{DS} = 15.0V, V_{GS} = 0V,$ $f = 1.0MHz$	1891	2521	3151	pF
Reverse Transfer Capacitance	$C_{riss}$		186	248	310	
Output Capacitance	$C_{oss}$		398	531	664	
Turn-On Delay Time	$t_{d(on)}$	$V_{GS} = 10V, V_{DS} = 15.0V,$ $I_D = 26A, R_G = 3.0\Omega$	-	12.6	-	ns
Rise Time	$t_r$		-	12.1	-	
Turn-Off Delay Time	$t_{d(off)}$		-	42.6	-	
Fall Time	$t_f$		-	11.2	-	
Gate Resistance	$R_g$	$f=1 MHz$	-	1.0	2.0	$\Omega$
<b>Drain-Source Body Diode Characteristics</b>						
Source-Drain Diode Forward Voltage	$V_{SD}$	$I_S = 26A, V_{GS} = 0V$	-	0.8	1.1	V
Body Diode Reverse Recovery Time	$t_{rr}$	$I_F = 26A, di/dt = 100A/\mu s$	-	29.9	44.9	ns
Body Diode Reverse Recovery Charge	$Q_{rr}$		-	21.4	32.1	nC

Note :

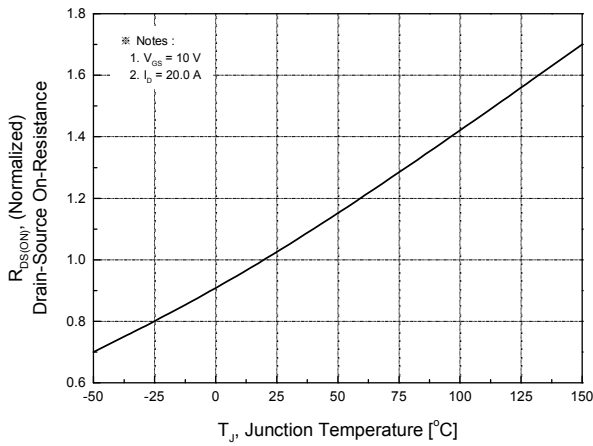
- Surface mounted FR-4 board by JEDEC (jesd51-7)
- $E_{AS}$  is tested at starting  $T_J = 25^\circ C$ ,  $L = 0.1mH$ ,  $I_{AS} = .34.0A$ ,  $V_{DD} = 27V$ ,  $V_{GS} = 10V$ .
- $T < 10sec$ .



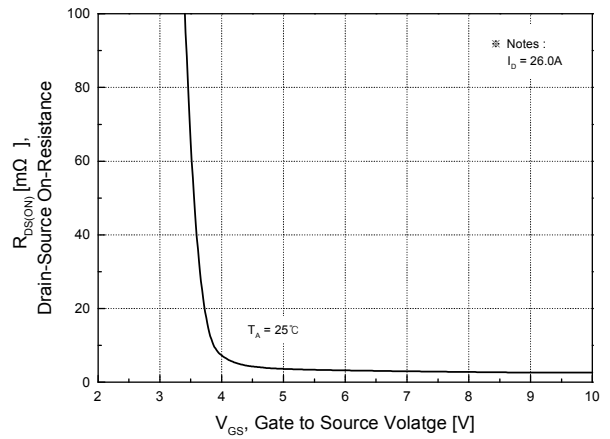
**Fig.1 On-Region Characteristics**



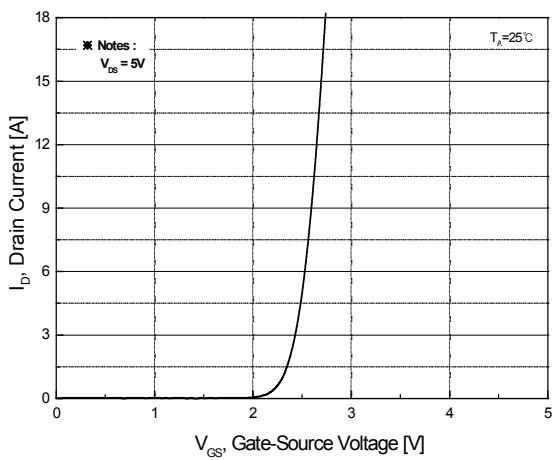
**Fig.2 On-Resistance Variation with Drain Current and Gate Voltage**



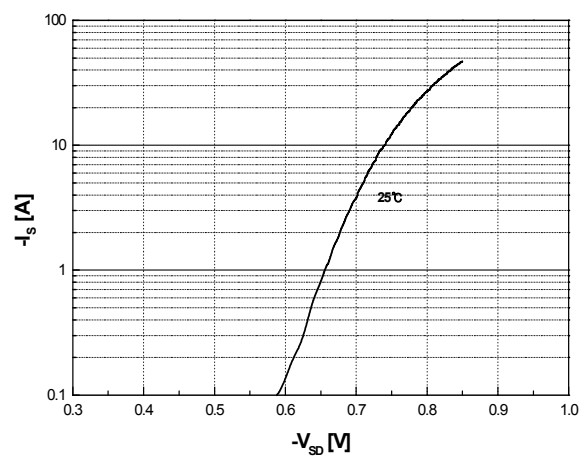
**Fig.3 On-Resistance Variation with Temperature**



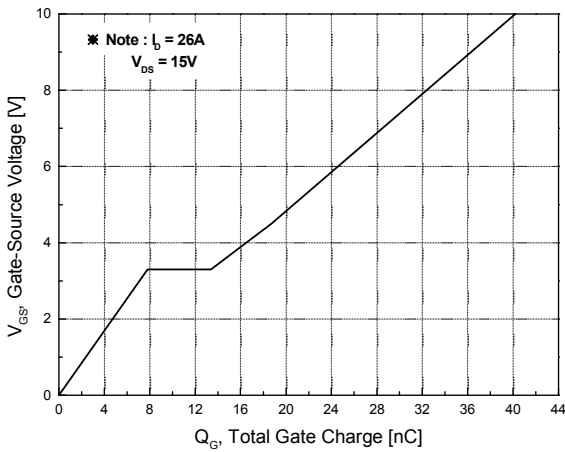
**Fig.4 On-Resistance Variation with Gate to Source Voltage**



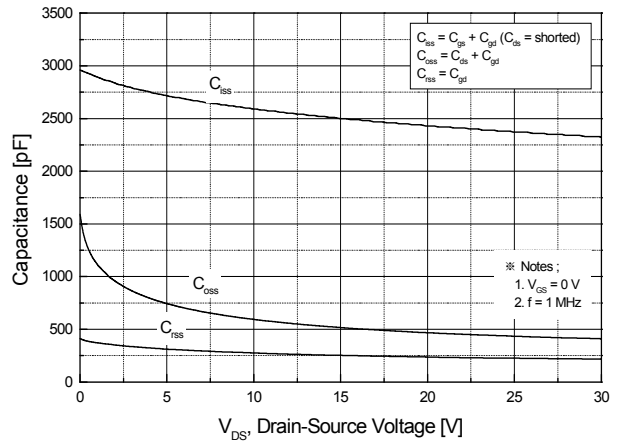
**Fig.5 Transfer Characteristics**



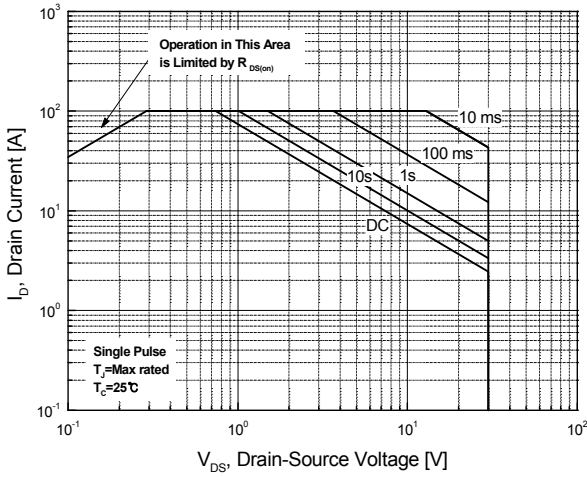
**Fig.6 Body Diode Forward Voltage Variation with Source Current and Temperature**



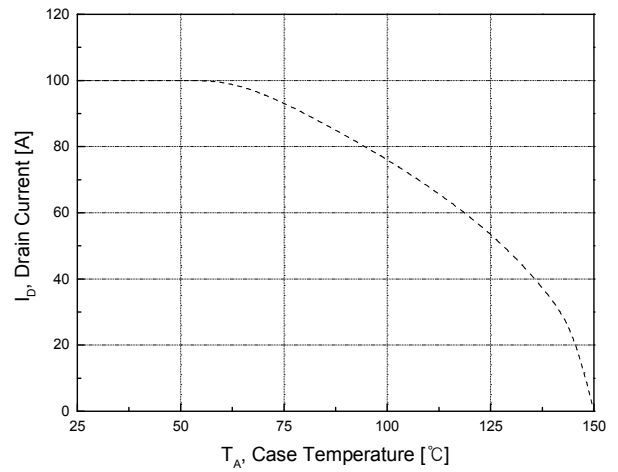
**Fig.7 Gate Charge Characteristics**



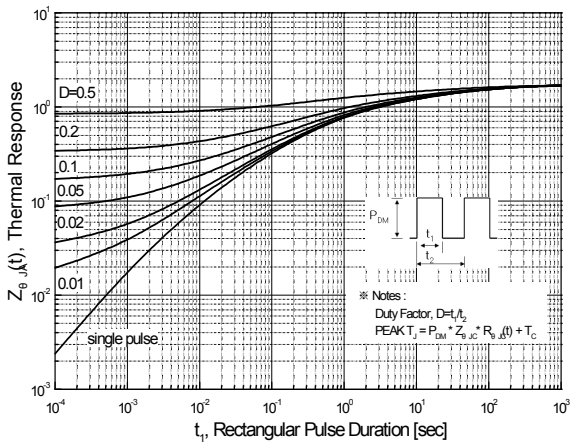
**Fig.8 Capacitance Characteristics**



**Fig.9 Maximum Safe Operating Area**



**Fig.10 Maximum Drain Current vs. Case Temperature**

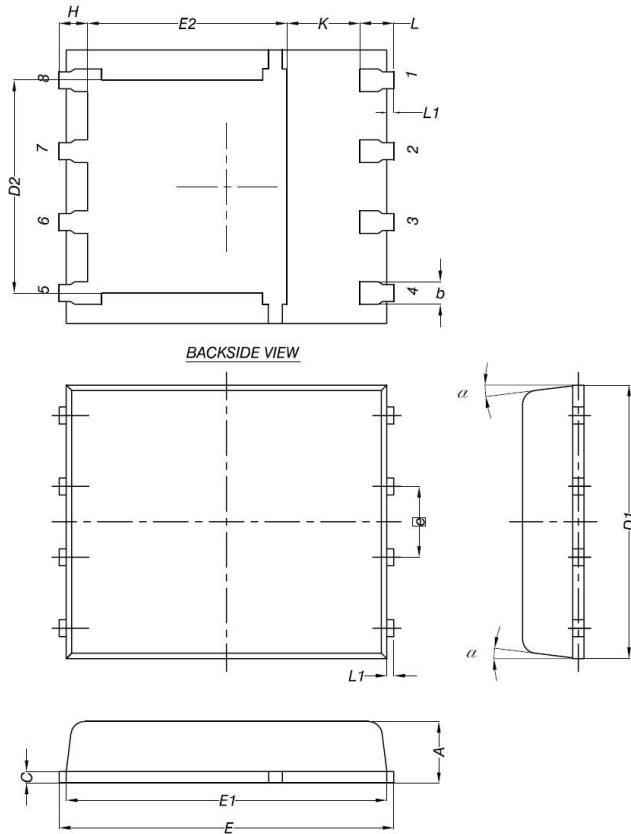


**Fig.11 Transient Thermal Response Curve**

## Package Dimension

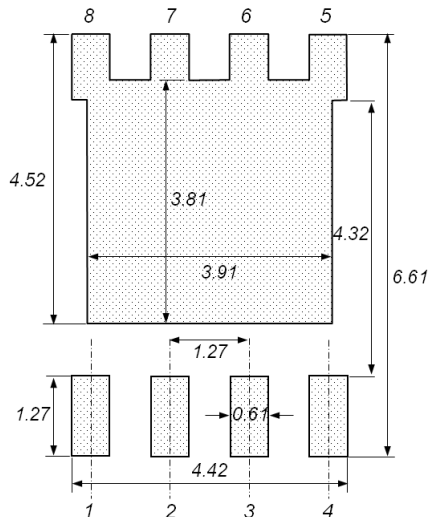
### PDFN56 (5x6mm)

Dimensions are in millimeters, unless otherwise specified



Dimension	MILLIMETERS	
	Min	Max
A	0.90	1.10
b	0.33	0.51
C	0.20	0.34
D1	4.50	5.10
D2	-	4.22
E	5.90	6.30
E1	5.50	6.10
E2	-	4.30
e	1.27BSC	
H	0.41	0.71
K	0.20	-
L	0.51	0.71
$\alpha$	0°	12°

### Land Pattern



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