

### General Description

The MDS1754 uses advanced MagnaChip's Trench MOSFET Technology to provide high performance in on-state resistance, switching performance and reliability.

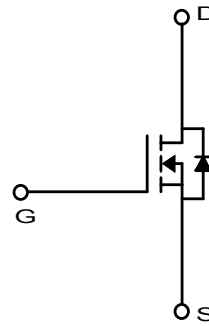
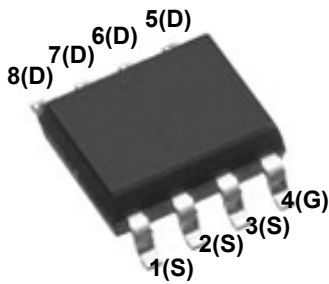
Low  $R_{DS(ON)}$ , Low Gate Charge can be offering superior benefit in the application.

### Features

- $V_{DS} = 40V$
- $I_D = 7.6 (V_{GS} = 10V)$
- $R_{DS(ON)}$   
 $< 29m\Omega @ V_{GS} = 10V$   
 $< 37m\Omega @ V_{GS} = 4.5V$

### Applications

- Inverters
- General purpose applications



### Absolute Maximum Ratings ( $T_A = 25^\circ$ unless otherwise noted)

Characteristics	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DSS}$	40	V
Gate-Source Voltage	$V_{GSS}$	$\pm 20$	V
Continuous Drain Current (Note 1)	$I_D$	7.6	A
Pulsed Drain Current	$I_{DM}$	50	A
Power Dissipation	$P_D$	2.5	W
Single Pulse Avalanche Energy (Note 2)	$E_{AS}$	18	mJ
Junction and Storage Temperature Range	$T_J, T_{stg}$	-55~+150	$^\circ C$

### Thermal Characteristics

Characteristics	Symbol	Rating	Unit
Thermal Resistance, Junction-to-Ambient (Note 1)	$R_{\theta JA}$	50	$^\circ C/W$
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	25	

## Ordering Information

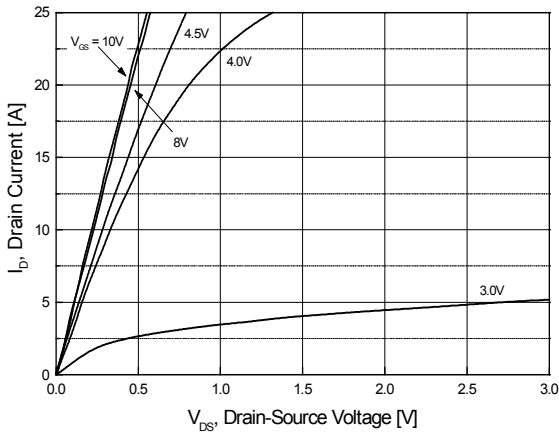
Part Number	Temp. Range	Package	Packing	RoHS Status
MDS1754RH	-55~150°C	SOIC-8	Tape & Reel	Halogen Free

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

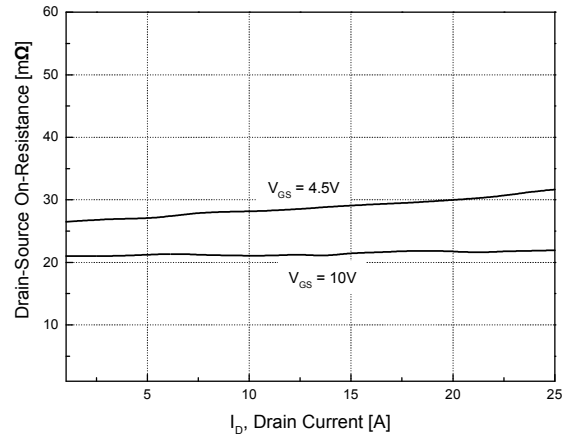
Characteristics	Symbol	Test Condition	Min	Typ	Max	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	I <sub>D</sub> = 250μA, V <sub>GS</sub> = 0V	40	-	-	V
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA	1.0	1.8	3.0	
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = 32V, V <sub>GS</sub> = 0V	-		1	μA
Gate Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V	-	-	±0.1	
Drain-Source ON Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> = 10V, I <sub>D</sub> = 7.6A	-	22	29	mΩ
		V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 6.8A		28	37	
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> = 10V, I <sub>D</sub> = 7.6A		20	-	S
<b>Dynamic Characteristics</b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>DD</sub> = 28V, I <sub>D</sub> = 7.6A, V <sub>GS</sub> = 10V	-	9.2	-	nC
Gate-Source Charge	Q <sub>gs</sub>		-	1.7	-	
Gate-Drain Charge	Q <sub>gd</sub>		-	2.2	-	
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> = 25V, V <sub>GS</sub> = 0V, f = 1.0MHz	-	440	-	pF
Reverse Transfer Capacitance	C <sub>rss</sub>		-	38	-	
Output Capacitance	C <sub>oss</sub>		-	76	-	
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>GS</sub> = 10V, V <sub>DD</sub> = 20V, I <sub>D</sub> = 1A, R <sub>GEN</sub> = 3.3Ω	-	5.9	-	ns
Turn-On Rise Time	t <sub>r</sub>		-	17.3	-	
Turn-Off Delay Time	t <sub>d(off)</sub>		-	16.5	-	
Turn-Off Fall Time	t <sub>f</sub>		-	10.7	-	
<b>Drain-Source Body Diode Characteristics</b>						
Source-Drain Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> = 7.6A, V <sub>GS</sub> = 0V	-	0.88	1.2	V
Reverse Recovery Time	t <sub>rr</sub>	I <sub>S</sub> = 7.6A, di/dt = 100A/us	-	35	-	ns
Reverse Recovery Charge	Q <sub>rr</sub>		-	8.8	-	nC

Notes :

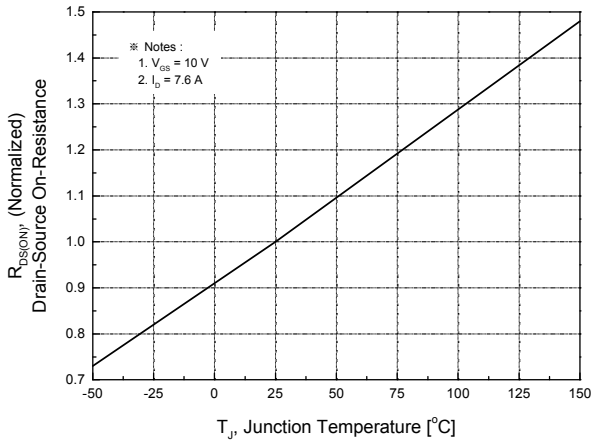
1. Surface mounted RF4 board with 2oz. Copper.
2. Starting T<sub>J</sub> = 25°C, L = 1mH, I<sub>AS</sub> = 6A, V<sub>DD</sub> = 20V, V<sub>GS</sub> = 10V



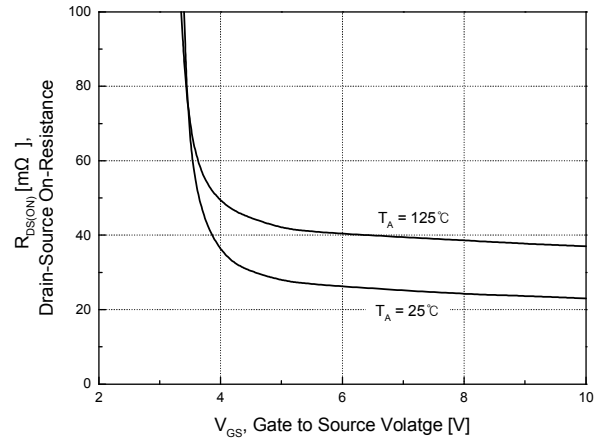
**Fig.1 On-Region Characteristics**



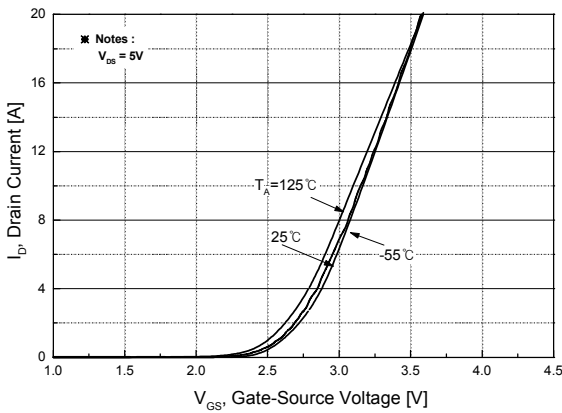
**Fig.2 On-Resistance Variation with Drain Current and Gate Voltage**



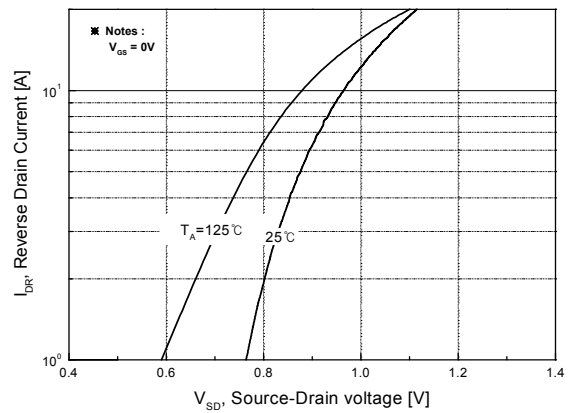
**Fig.3 On-Resistance Variation with Junction Temperature**



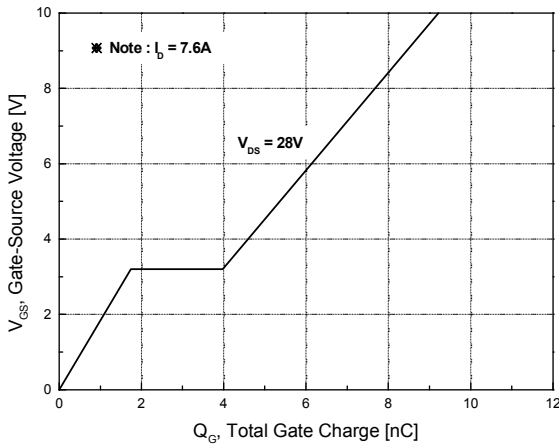
**Fig.4 On-Resistance Variation with Gate to Source Voltage**



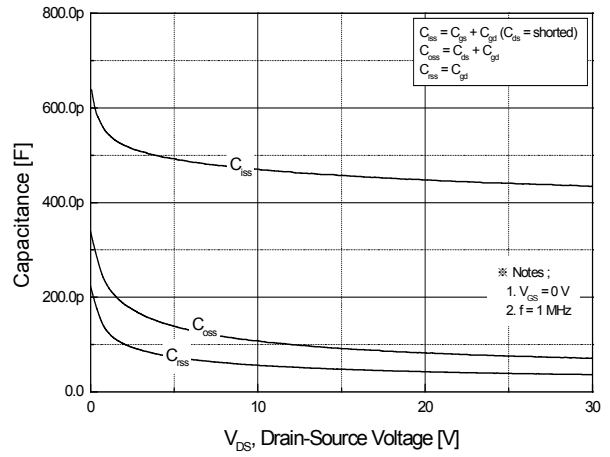
**Fig.5 Transfer Characteristics**



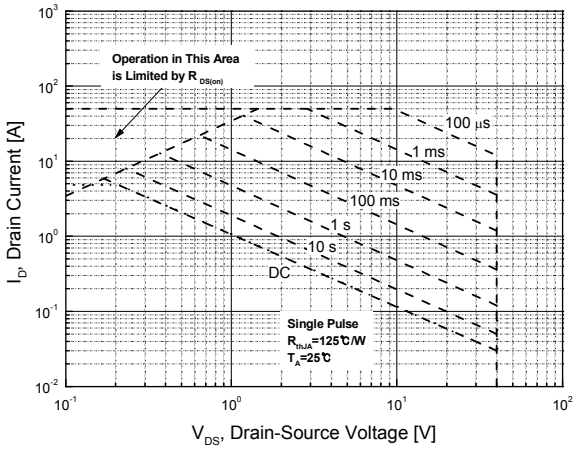
**Fig.6 Body Diode Forward Voltage Variation with Source Current and Temperature**



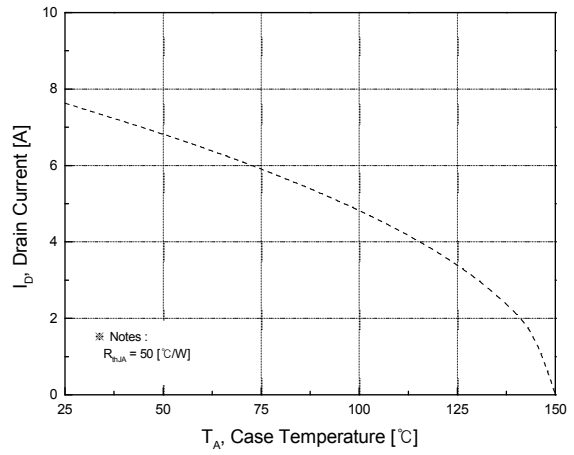
**Fig.7 Gate Charge Characteristics**



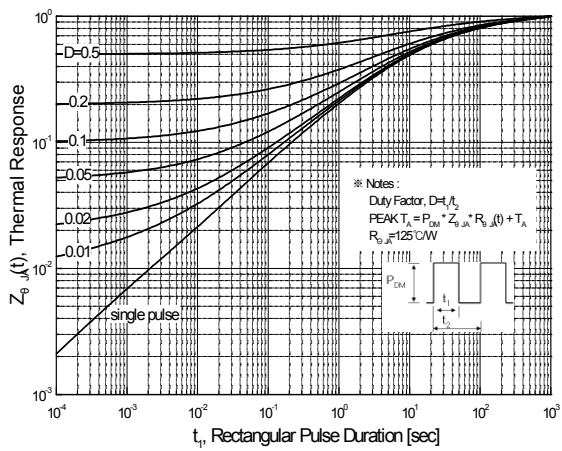
**Fig.8 Capacitance Characteristics**



**Fig.9 Maximum Safe Operating Area**



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

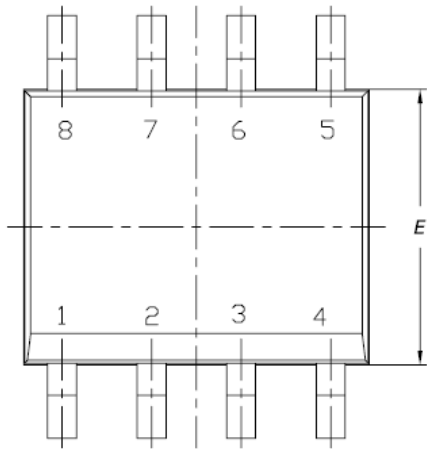


**Fig.11 Transient Thermal Response Curve**

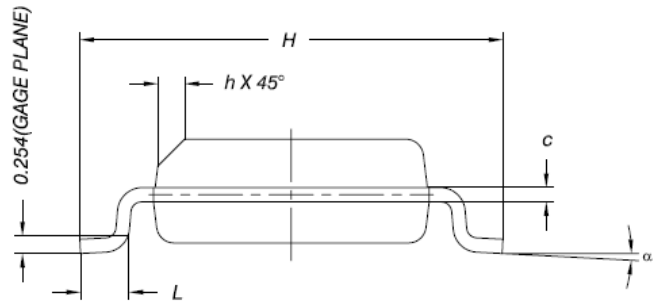
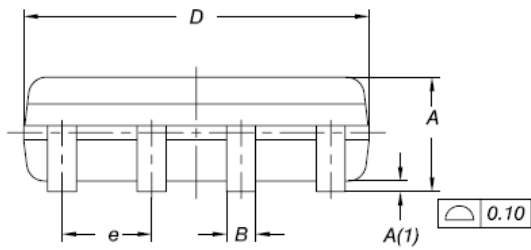
## Physical Dimensions

### 8 Leads, SOIC

Dimensions are in millimeters unless otherwise specified



DIM.	MILLIMETERS		
	MIN.	NOM.	MAX.
A	1.35	1.55	1.75
A(1)	0.10	0.175	0.25
B	0.38	0.445	0.51
C	0.19	0.22	0.25
D	4.80	4.90	5.00
E	3.80	3.90	4.00
e	1.27 BSC		
H	5.80	6.00	6.20
L	0.50	0.715	0.93
$\alpha$	0°	4°	8°
h	0.25	0.375	0.50



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