

### General Description

The MDS3753E uses advanced MagnaChip's MOSFET Technology to provide low on-state resistance, high switching performance and excellent reliability

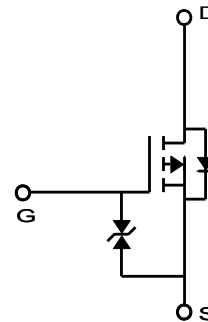
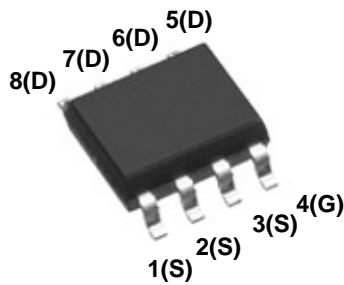
Low  $R_{DS(ON)}$  and low gate charge operation offer superior benefit in the application.

### Features

- $V_{DS} = -40V$
- $I_D = -7.1A @ V_{GS} = 10V$
- $R_{DS(ON)}$   
 $<30m\Omega @ V_{GS} = -10V$   
 $<37m\Omega @ V_{GS} = -4.5V$

### Applications

- Inverters
- General purpose applications



### Absolute Maximum Ratings ( $T_A = 25^\circ C$ 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)	$I_D$	-7.1	A
Pulsed Drain Current	$I_{DM}$	-50	A
Power Dissipation	$P_D$	2.5	W
Single Pulse Avalanche Energy (Note 2)	$E_{AS}$	98	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

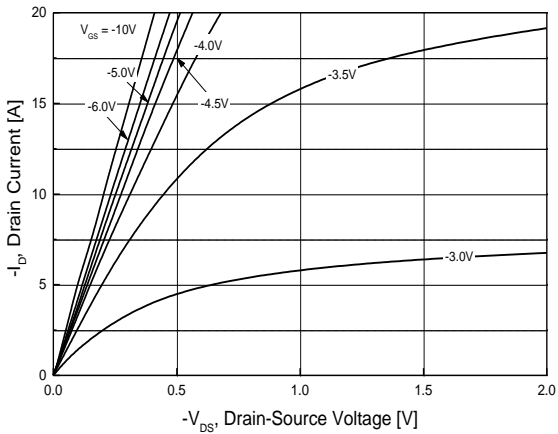
Part Number	Temp. Range	Package	Packing	RoHS Status
MDS3753EURH	-55~150°C	SO-8	Tape & Reel	Halogen Free

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

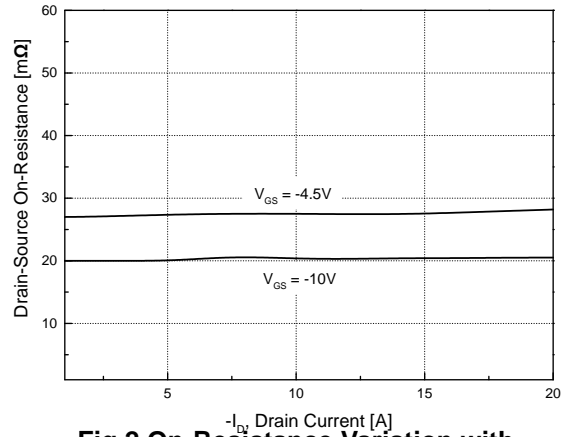
Characteristics	Symbol	Test Condition	Min	Typ	Max	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	I <sub>D</sub> = -250μA, V <sub>GS</sub> = 0V	-40	-	-	V
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250μA	-1.0	-1.8	-3.0	
Drain Cut-Off Current	I <sub>DSS</sub>	V <sub>DS</sub> = -40V, V <sub>GS</sub> = 0V	-	-	-10	μA
Gate Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> = ±16V, V <sub>DS</sub> = 0V	-	-	±10	
Drain-Source ON Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> = -10V, I <sub>D</sub> = -3.3A	-	20	30	mΩ
		V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -3.3A	-	27	37	
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> = -10V, I <sub>D</sub> = -3.3A		14	-	S
<b>Dynamic Characteristics</b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>DD</sub> = -32V, I <sub>D</sub> = -4.7A, V <sub>GS</sub> = -10V	-	32.7	-	nC
Gate-Source Charge	Q <sub>gs</sub>		-	4.1	-	
Gate-Drain Charge	Q <sub>gd</sub>		-	7.4	-	
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> = -15V, V <sub>GS</sub> = 0V, f = 1.0MHz	-	1423	-	pF
Reverse Transfer Capacitance	C <sub>rss</sub>		-	129	-	
Output Capacitance	C <sub>oss</sub>		-	221	-	
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>GS</sub> = -10V, V <sub>DD</sub> = -20V, I <sub>D</sub> = -3.3A R <sub>GEN</sub> = 4.7Ω	-	14.7	-	ns
Turn-On Rise Time	t <sub>r</sub>		-	7.1	-	
Turn-Off Delay Time	t <sub>d(off)</sub>		-	44.2	-	
Turn-Off Fall Time	t <sub>f</sub>		-	9.0	-	
<b>Drain-Source Body Diode Characteristics</b>						
Source-Drain Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> = -4.7A, V <sub>GS</sub> = 0V	-	0.81	1.2	V
Reverse Recovery Time	t <sub>rr</sub>	I <sub>S</sub> = -4.7A, di/dt=100A/us	-	34	-	ns
Reverse Recovery Charge	Q <sub>rr</sub>		-	36.5	-	nC

Note :

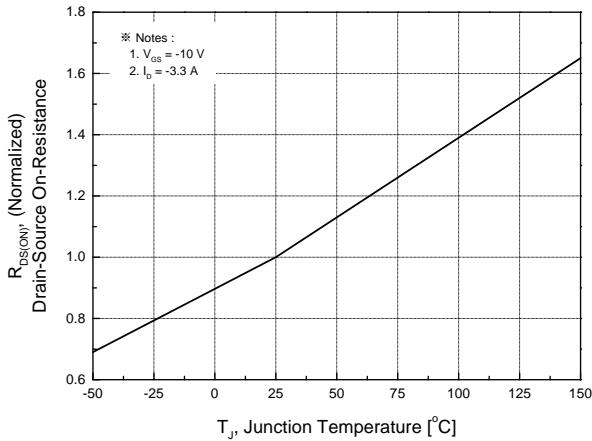
1. Surface mounted FR4 board with 2oz. Copper.
2. Starting T<sub>J</sub>=25°C, L=1mH, I<sub>AS</sub>=-14A V<sub>DD</sub>=-20V, V<sub>GS</sub>=-10V



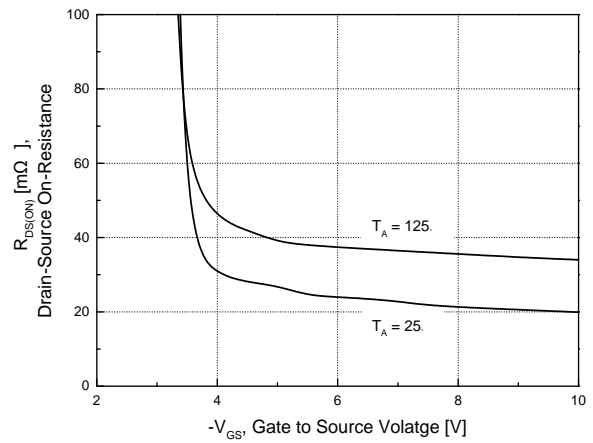
**Fig.1 On-Region Characteristics**



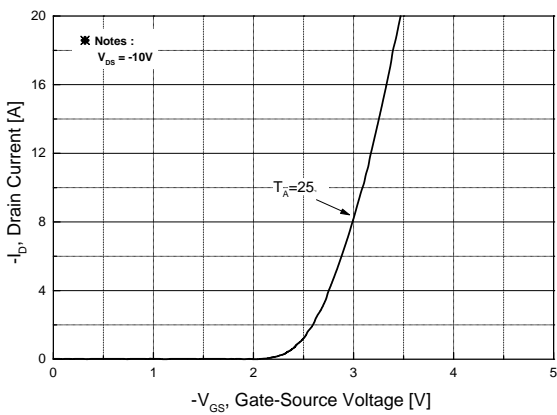
**Fig.2 On-Resistance Variation with Drain Current and Gate Voltage**



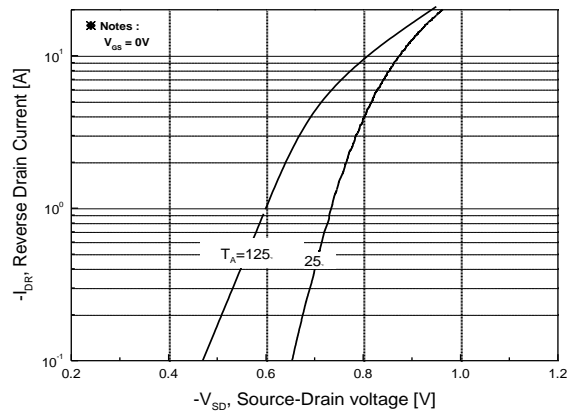
**Fig.3 On-Resistance Variation with Junction Temperature**



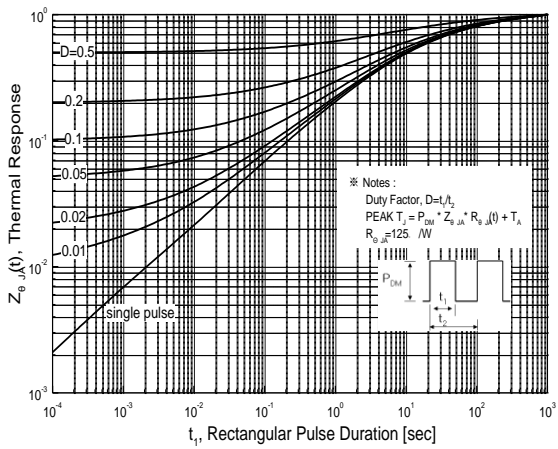
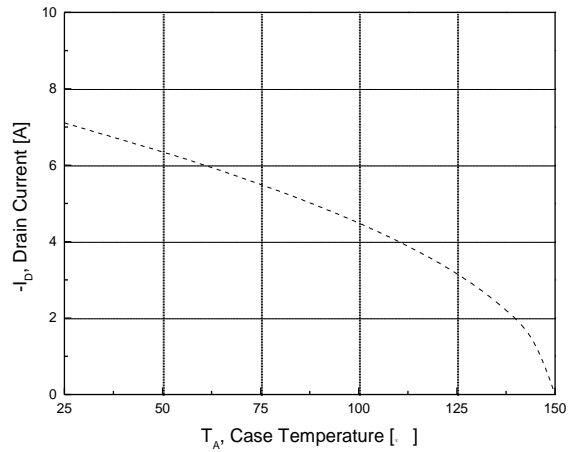
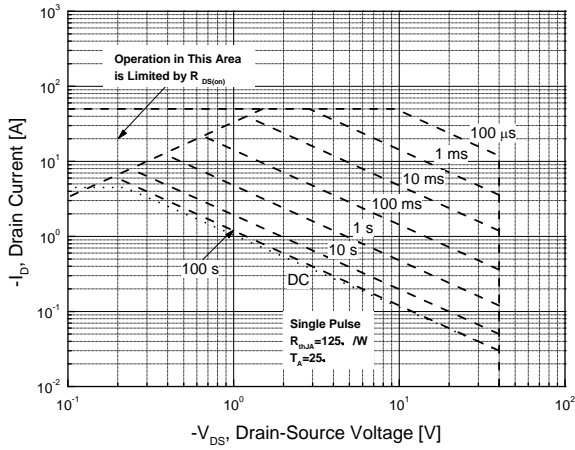
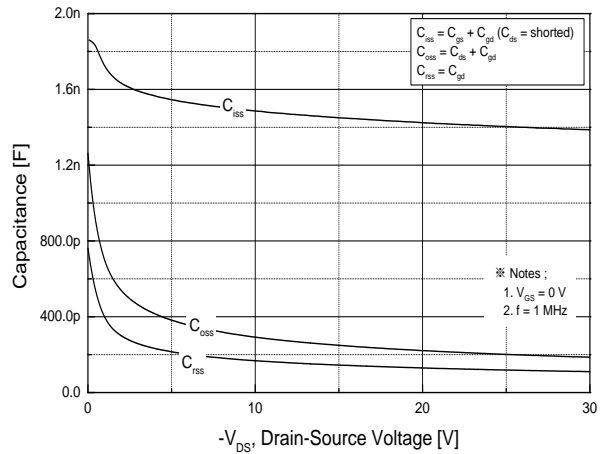
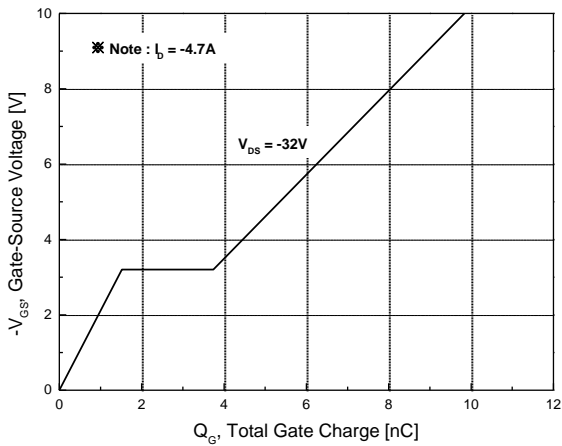
**Fig.4 On-Resistance Variation with Gate to Source Voltage**



**Fig.5 Transfer Characteristics**



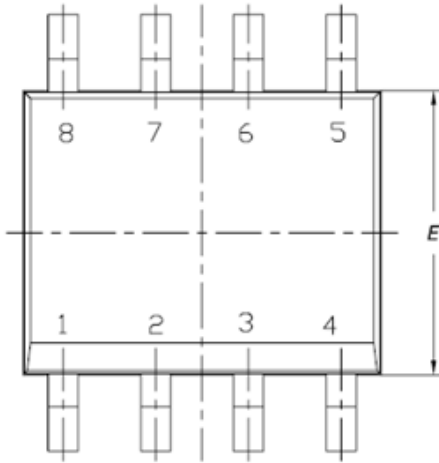
**Fig.6 Body Diode Forward Voltage Variation with Source Current and Temperature**



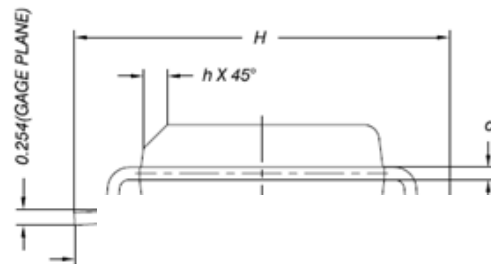
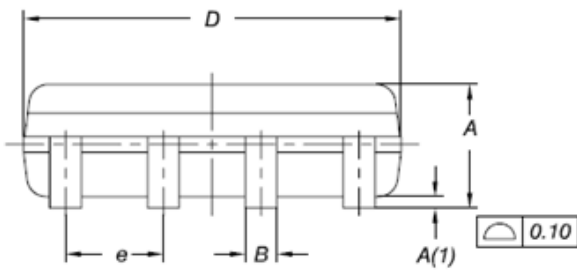
## Physical Dimensions

### 8 Leads, SOIC

Dimensions are in millimeters unless otherwise specified




Symbol	Min	Nom	Max
A	-	-	1.75
A(1)	0.10	-	0.25
B	0.31	-	0.51
C	0.10	-	0.25
D	4.9 BSC		
E	3.9 BSC		
e	1.27 BSC		
H	6.0 BSC		
L	0.40	-	1.27
a	0	-	8
h	0.250	-	0.500
L2(Gage plane)	0.25 BSC		



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