

### General Description

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

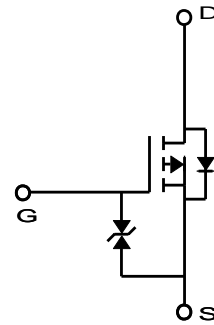
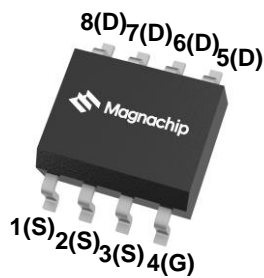
Low  $R_{DS(ON)}$  and low gate charge operation offer superior benefit in the application.

### 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

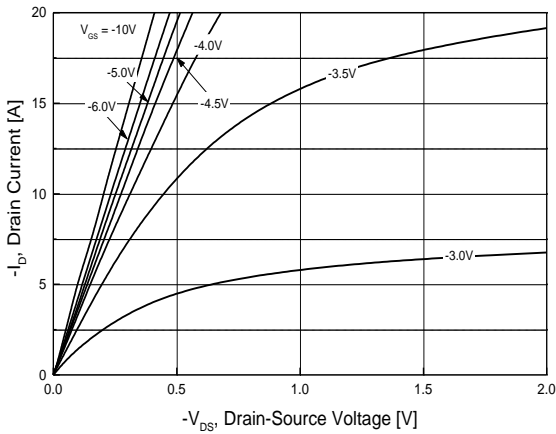
Part Number	Temp. Range	Package	Packing	RoHS Status
MDS3753EURH	-55~150°C	SOIC-8	Tape & Reel	Halogen Free

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

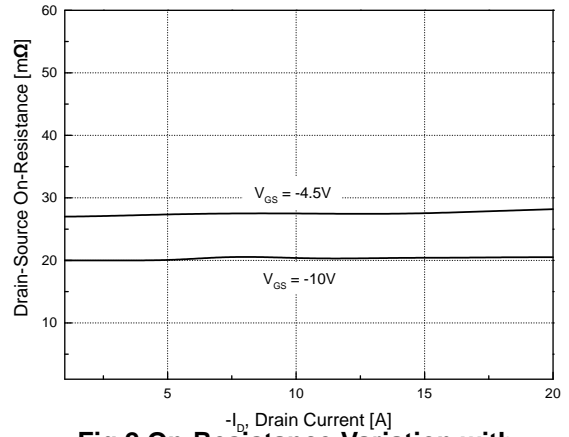
Characteristics	Symbol	Test Condition	Min	Typ	Max	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	I <sub>D</sub> = -250μA, V <sub>GS</sub> = 0V	-40	-	-	V
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250μA	-1.0	-1.8	-3.0	
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 :

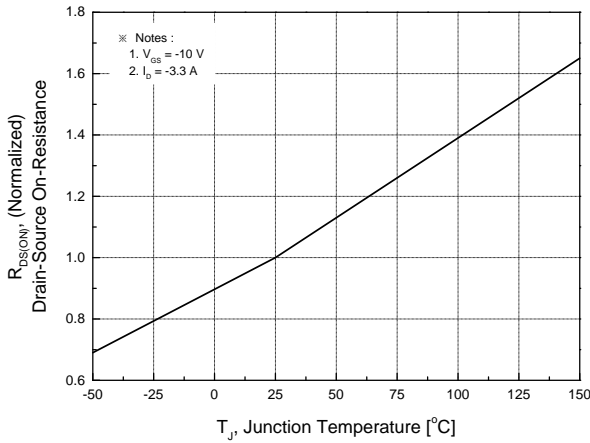
1. Surface mounted FR4 board with 2oz. Copper.
2. Starting T<sub>J</sub>=25°C, L=1mH, I<sub>AS</sub>=-14A V<sub>DD</sub>=-20V, V<sub>GS</sub>=-10V



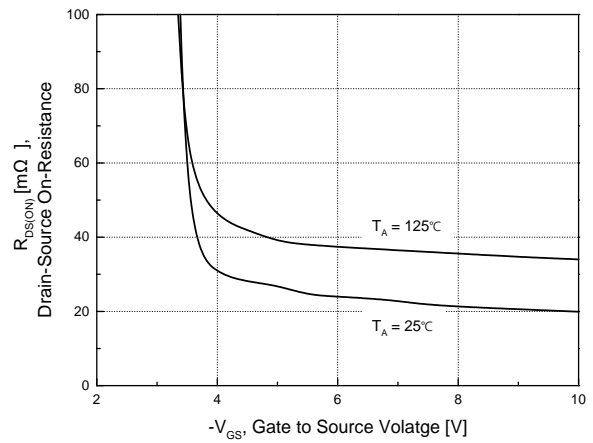
**Fig.1 On-Region Characteristics**



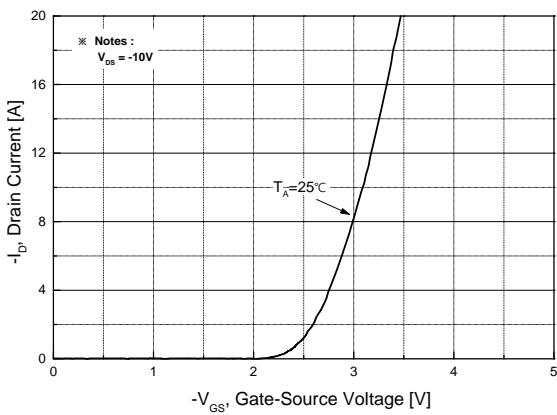
**Fig.2 On-Resistance Variation with Drain Current and Gate Voltage**



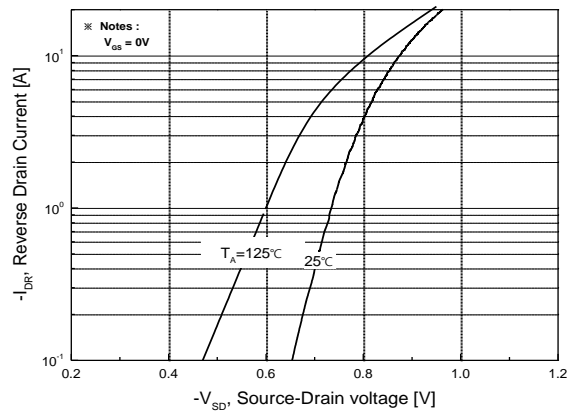
**Fig.3 On-Resistance Variation with Junction Temperature**



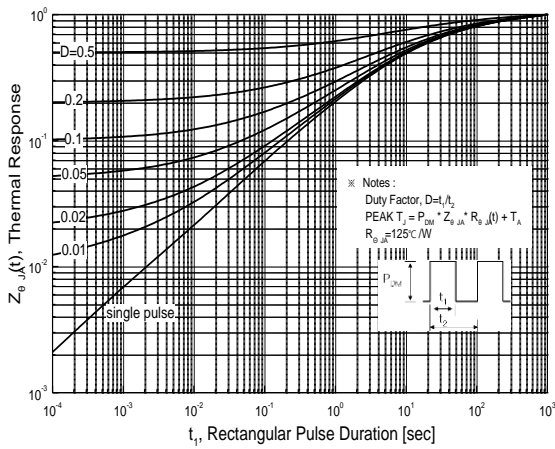
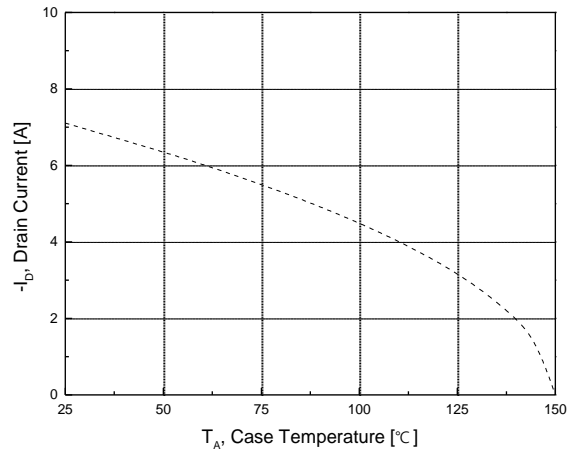
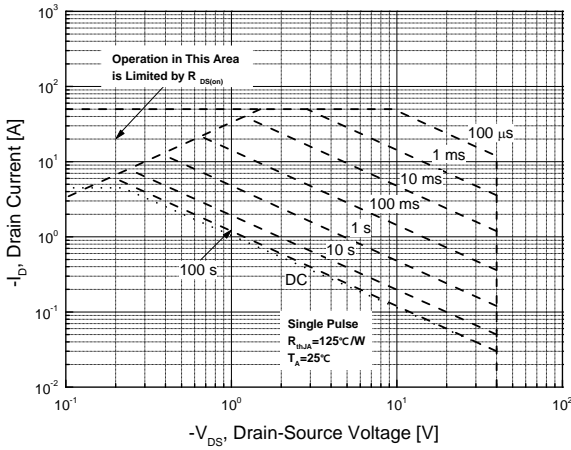
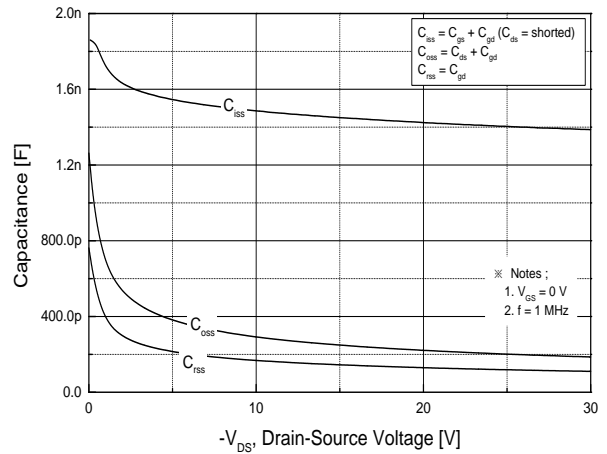
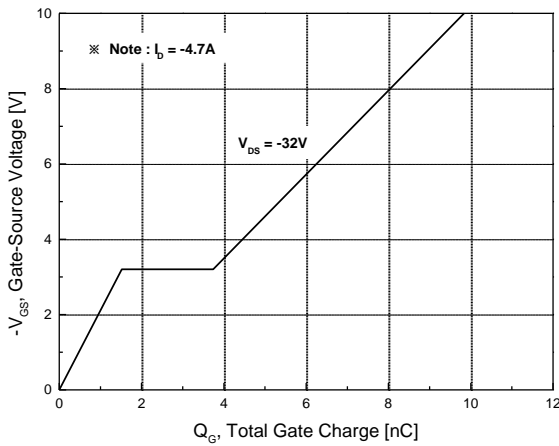
**Fig.4 On-Resistance Variation with Gate to Source Voltage**



**Fig.5 Transfer Characteristics**



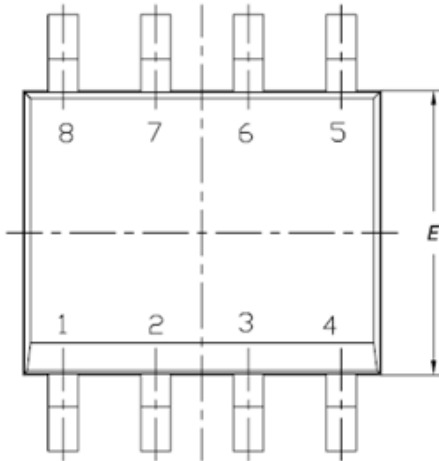
**Fig.6 Body Diode Forward Voltage Variation with Source Current and Temperature**



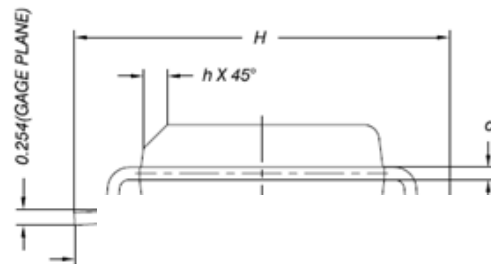
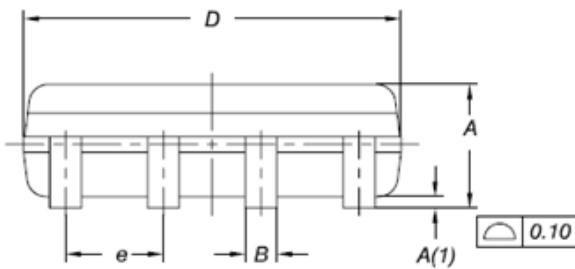
## Physical Dimensions

### SOIC-8L

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		



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.

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