

General Description

The MDD3752A uses advanced MagnaChip's Trench MOSFET Technology to provided high performance in on-state resistance, switching performance and reliability.

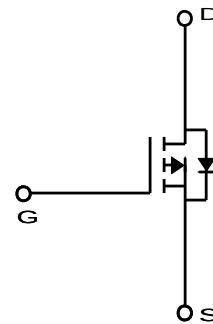
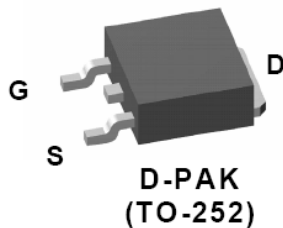
Low $R_{DS(ON)}$, Low Gate Charge can be offering superior benefit in the application.

Features

- $V_{DS} = -40V$
- $I_D = -43A$ @ $V_{GS} = -10V$
- $R_{DS(ON)} < 17m\Omega$ @ $V_{GS} = -10V$
- $R_{DS(ON)} < 25m\Omega$ @ $V_{GS} = -4.5V$

Applications

- Inverters
- General purpose applications



Absolute Maximum Ratings ($T_C = 25^\circ$)

Characteristics		Symbol	Rating	Unit
Drain-Source Voltage		V_{DSS}	-40	V
Gate-Source Voltage		V_{GSS}	± 20	V
Continuous Drain Current (Note 2)	$T_C = 25^\circ C$	I_D	43	A
	$T_C = 100^\circ C$		27	A
Pulsed Drain Current		I_{DM}	-90	A
Power Dissipation	$T_C = 25^\circ C$	P_D	50	W
	$T_C = 100^\circ C$		20	
Single Pulse Avalanche Energy (Note 3)		E_{AS}	128	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)		$R_{\theta JA}$	40	$^\circ C/W$
Thermal Resistance, Junction-to-Case		$R_{\theta JC}$	2.5	

Ordering Information

Part Number	Temp. Range	Package	Packing	RoHS Status
MDD3752ARH	-55~150°C	D-PAK	Tape & Reel	Halogen Free

Electrical Characteristics (T_J =25°C unless otherwise noted)

Characteristics	Symbol	Test Condition	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	I _D = -250μA, V _{GS} = 0V	-40	-	-	V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = -250μA	-1.0	-1.8	-3.0	
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = -32V, V _{GS} = 0V	-		-1	μA
Gate Leakage Current	I _{GSS}	V _{GS} = ±20V, V _{DS} = 0V	-	-	±0.1	
Drain-Source ON Resistance	R _{DS(ON)}	V _{GS} = -10V, I _D = -20A	-	13	17	mΩ
		V _{GS} = -4.5V, I _D = -10A		19	25	
Forward Transconductance	g _{FS}	V _{DS} = -10V, I _D = -20A		40	-	S
Dynamic Characteristics						
Total Gate Charge	Q _g	V _{DD} = -20V, I _D = -20A, V _{GS} = -10V	-	32.4	-	nC
Gate-Source Charge	Q _{gs}		-	5.2	-	
Gate-Drain Charge	Q _{gd}		-	5.1	-	
Input Capacitance	C _{iSS}	V _{DS} = -20V, V _{GS} = 0V, f = 1.0MHz	-	1482	-	pF
Reverse Transfer Capacitance	C _{rSS}		-	125	-	
Output Capacitance	C _{oss}		-	233	-	
Turn-On Delay Time	t _{d(on)}	V _{GS} = -10V, V _{DD} = -20V, I _D = -1A, R _{GEN} =6.0Ω	-	11.6	-	ns
Turn-On Rise Time	t _r		-	10.4	-	
Turn-Off Delay Time	t _{d(off)}		-	50.8	-	
Turn-Off Fall Time	t _f		-	12.1	-	
Drain-Source Body Diode Characteristics						
Source-Drain Diode Forward Voltage	V _{SD}	I _S = -20A, V _{GS} = 0V	-	-	1.2	V
Reverse Recovery Time	trr	I _S = -20A, di/dt=100A/us	-	40	-	ns
Reverse Recovery Charge	Qrr		-	40	-	nC

Note :

1. Surface mounted RF4 board with 2oz. Copper.
2. P_D is based on T_{J(MAX)}=150°C, P_D(T_C=25°C) is based on R_{θJC}.
3. Starting T_J=25°C, L=1mH, I_{AS}=-16A V_{DD}=-20V, V_{GS}=-10V

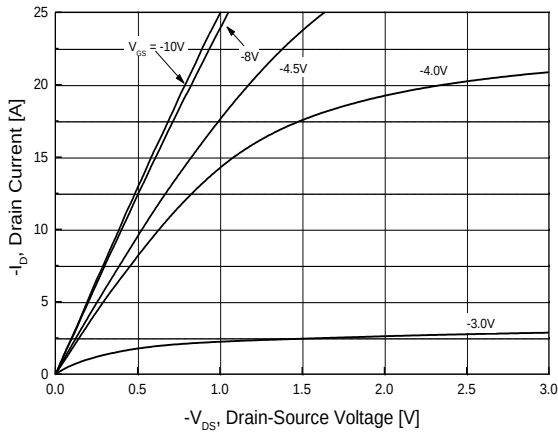


Fig.1 On-Region Characteristics

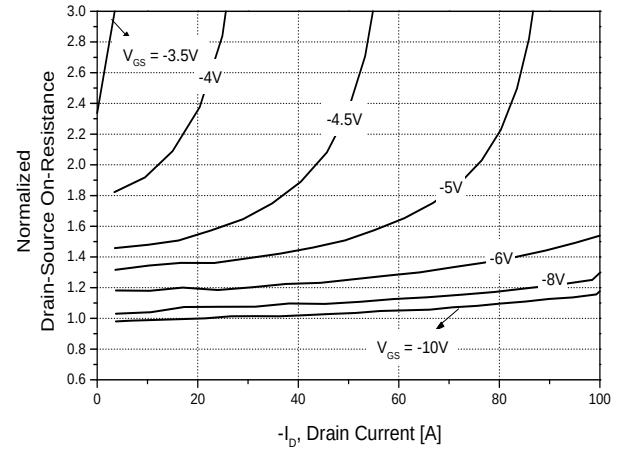


Fig.2 On-Resistance Variation with Drain Current and Gate Voltage

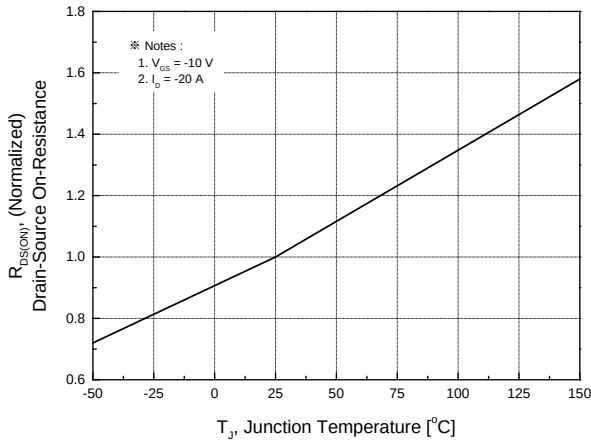


Fig.3 On-Resistance Variation with Temperature

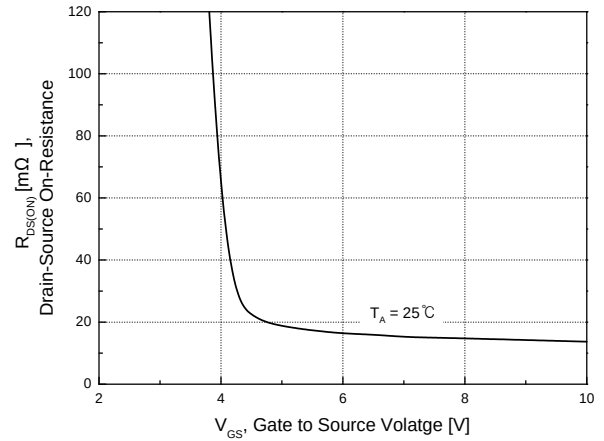


Fig.4 On-Resistance Variation with Gate to Source Voltage

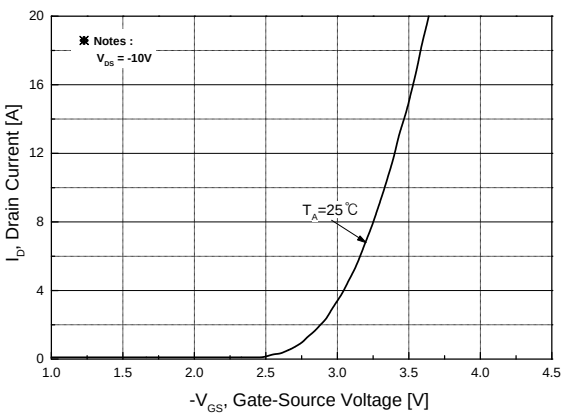


Fig.5 Transfer Characteristics

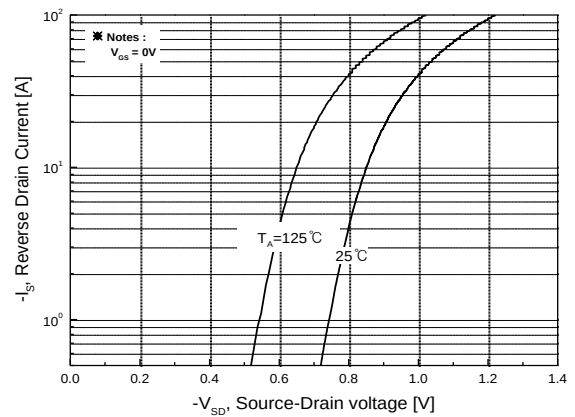
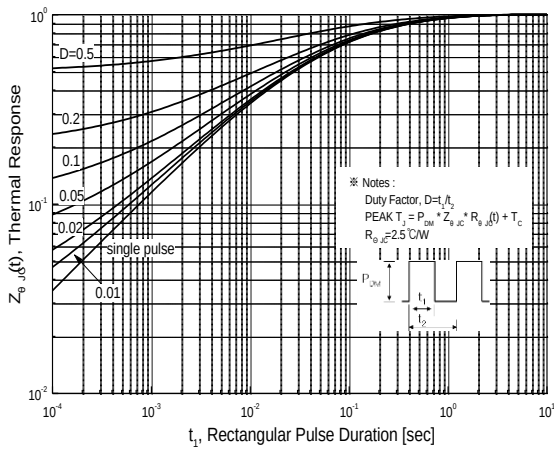
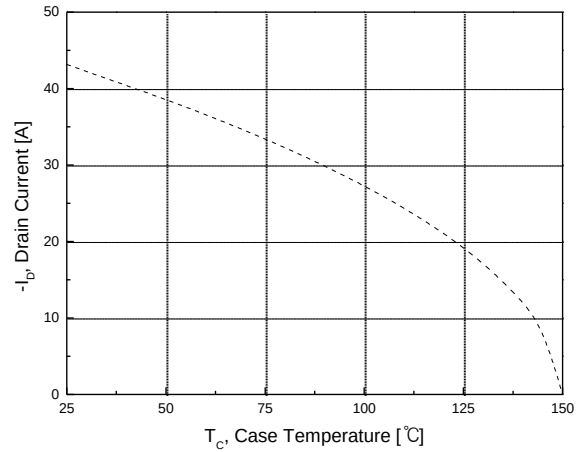
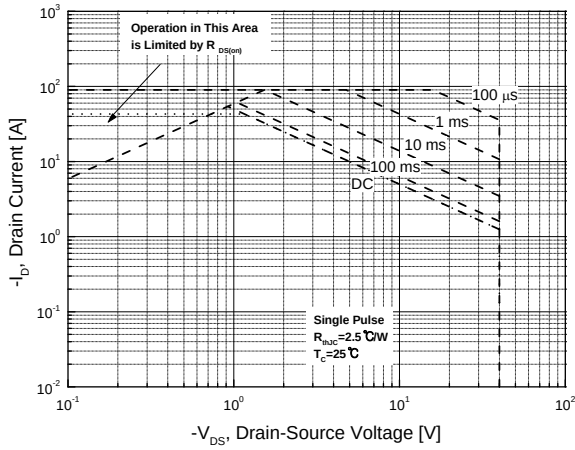
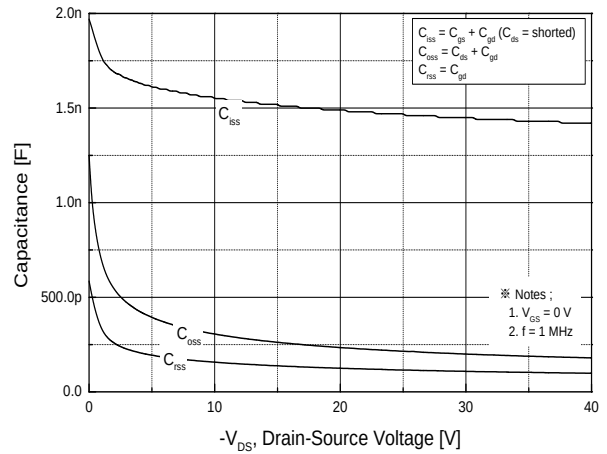
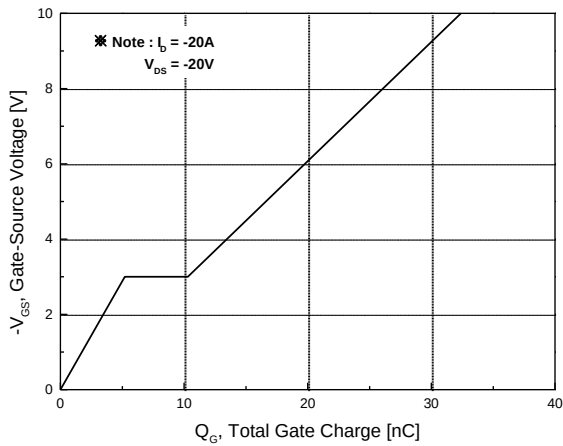


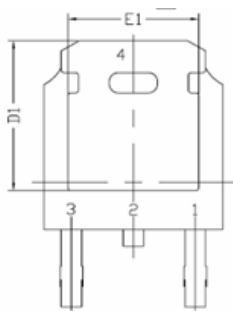
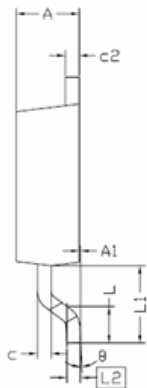
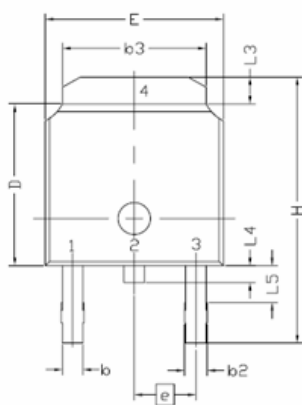
Fig.6 Body Diode Forward Voltage Variation with Source Current and Temperature



Physical Dimensions

2 Leads, DPAK (TO252)

Dimensions are in millimeters unless otherwise specified



Symbol	Min.	Nom.	Max.
E	6,35	-	6,73
L	1,40	1,52	1,78
L1	2,74 REF		
L2	0,508 BCS		
L3	0,89	-	1,27
L4	-	-	1,02
L5	1,14	-	1,52
D	5,97	6,10	6,22
H	9,40	-	10,41
b	0,64	-	0,89
b2	0,76	-	1,14
b3	4,95	-	5,46
e	2,286 BSC		
A	2,18	-	2,39
A1	-	-	0,13
c	0,46	-	0,61
c2	0,46	-	0,89
D1	5,21	-	-
E1	4,32	-	-
⌀	0,00	-	10,00

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