

General Description

The MDE1752 uses advanced MagnaChip's trench MOSFET Technology to provide high performance in on-state resistance, switching performance and reliability

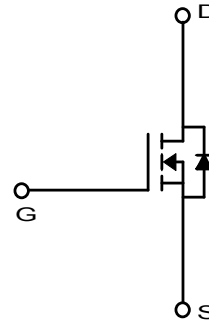
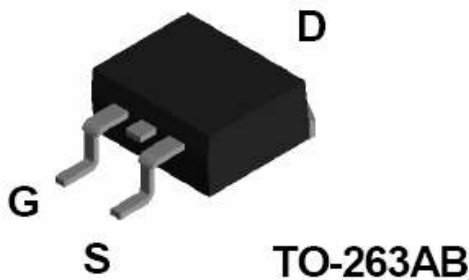
Low $R_{DS(ON)}$, low gate charge can be offering superior benefit in the application.

Features

- $V_{DS} = 40V$
- $I_D = 66A$ @ $V_{GS} = 10V$
- $R_{DS(ON)} < 8.0m\Omega$ @ $V_{GS} = 10V$
- $< 10.5m\Omega$ @ $V_{GS} = 4.5V$

Applications

- Inverters
- General purpose applications



Absolute Maximum Ratings ($T_C = 25^\circ C$ unless otherwise noted)

Characteristics	Symbol	Rating	Unit
Drain-Source Voltage	V_{DSS}	40	V
Gate-Source Voltage	V_{GSS}	± 20	V
Continuous Drain Current (Note 2)	I_D	66	A
Pulsed Drain Current	I_{DM}	100	A
Power Dissipation for Single Operation	P_D	$T_C = 25^\circ C$	60
		$T_A = 25^\circ C$	3.1
Single Pulse Avalanche Energy (Note 3)	E_{AS}	153	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	$R_{\theta JC}$	2.1	

Ordering Information

Part Number	Temp. Range	Package	Packing	RoHS Status
MDE1752RH	-55~150°C	TO-263	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	1.7	3.0	V
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	μA
Drain-Source ON Resistance	R _{DS(ON)}	V _{GS} = 10V, I _D = 14A	-	6.1	8.0	mΩ
		V _{GS} = 4.5V, I _D = 11A	-	8.2	10.5	
Forward Transconductance	g _{FS}	V _{DS} = 5V, I _D = 14A	-	58	-	S
Dynamic Characteristics						
Total Gate Charge	Q _g	V _{DS} = 20V, I _D = 14A, V _{GS} = 10V	-	26.4	-	nC
Gate-Source Charge	Q _{gs}		-	3.6	-	
Gate-Drain Charge	Q _{gd}		-	6.8	-	
Input Capacitance	C _{iss}	V _{DS} = 20V, V _{GS} = 0V, f = 1.0MHz	-	1480	-	pF
Reverse Transfer Capacitance	C _{rss}		-	113	-	
Output Capacitance	C _{oss}		-	243	-	
Turn-On Delay Time	t _{d(on)}	V _{GS} = 10V, V _{DS} = 20V, I _D = 1A, R _{GEN} = 6Ω	-	9	-	ns
Turn-On Rise Time	t _r		-	21	-	
Turn-Off Delay Time	t _{d(off)}		-	31	-	
Turn-Off Fall Time	t _f		-	18	-	
Drain-Source Body Diode Characteristics						
Source-Drain Diode Forward Voltage	V _{SD}	I _S = 14A, V _{GS} = 0V	-	0.8	1.2	V
Body Diode Reverse Recovery Time	t _{rr}	I _F = 14A, di/dt = 100A/μs	-	26	-	ns
Body Diode Reverse Recovery Charge	Q _{rr}		-	11	-	nC

Note :

- Surface mounted RF4 board with 2oz. Copper.
- P_D is based on T_{J(MAX)}=150°C
P_D (T_C=25°C) is based on R_{θJC},
- Starting T_J=25°C, L=1mH, I_{AS}=17.5A, V_{DD}=40V, V_{GS}=10V

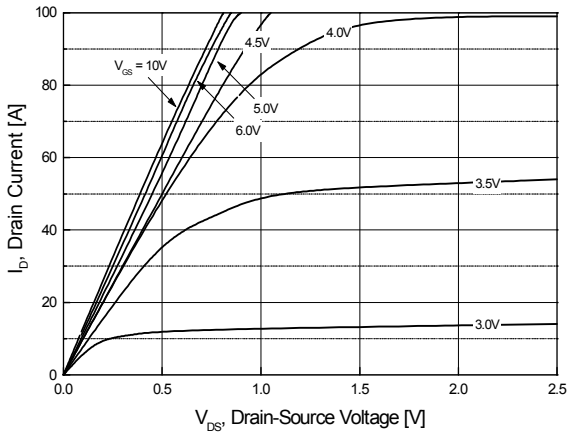


Fig.1 On-Region Characteristics

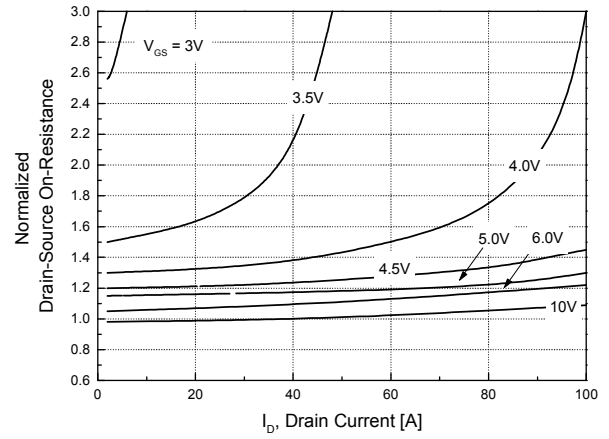


Fig.2 On-Resistance Variation with Drain Current and Gate Voltage

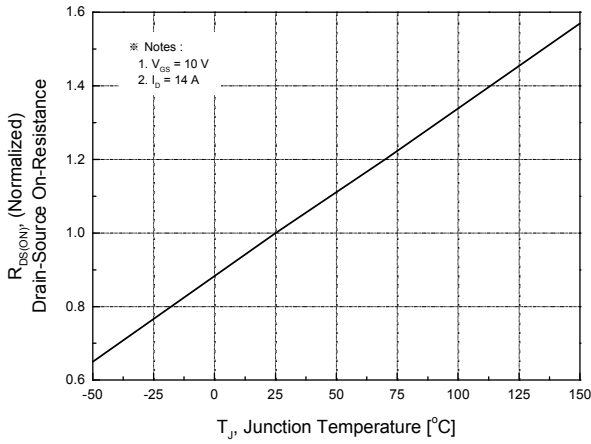


Fig.3 On-Resistance Variation with Temperature

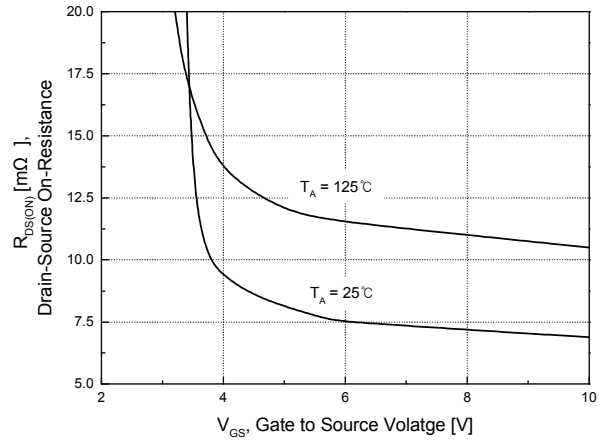


Fig.4 On-Resistance Variation with Gate to Source Voltage

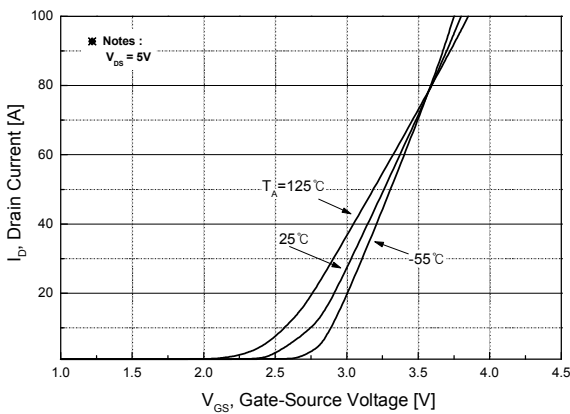


Fig.5 Transfer Characteristics

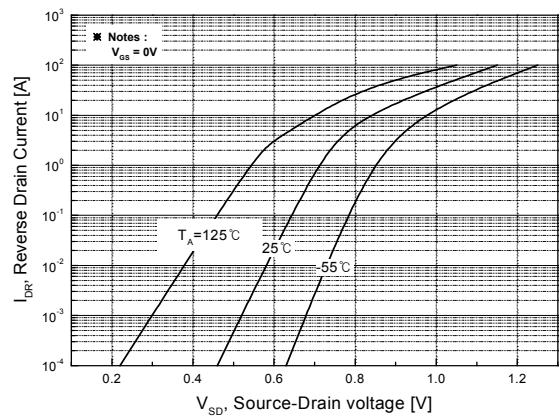
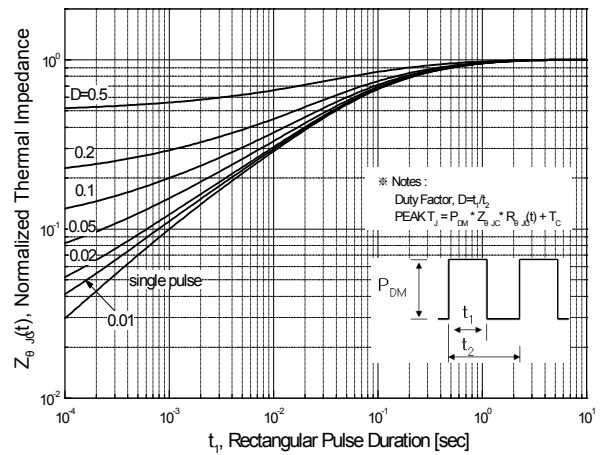
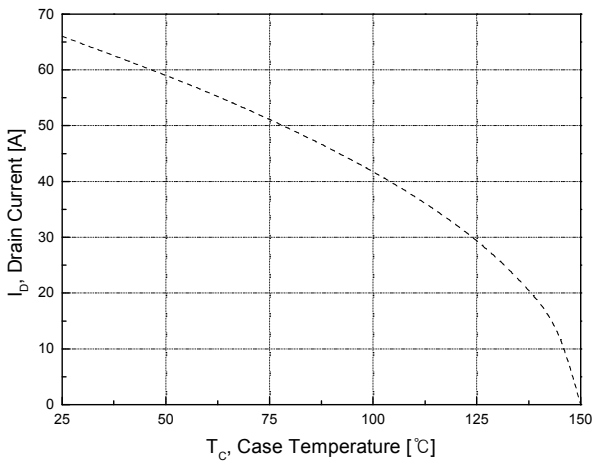
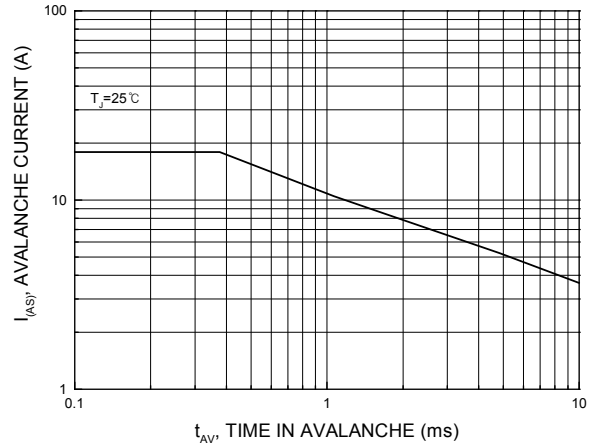
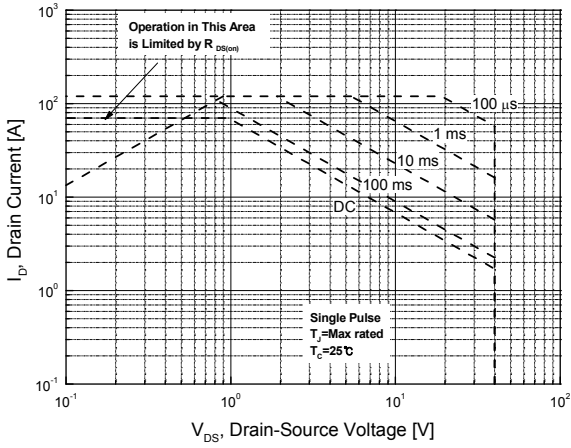
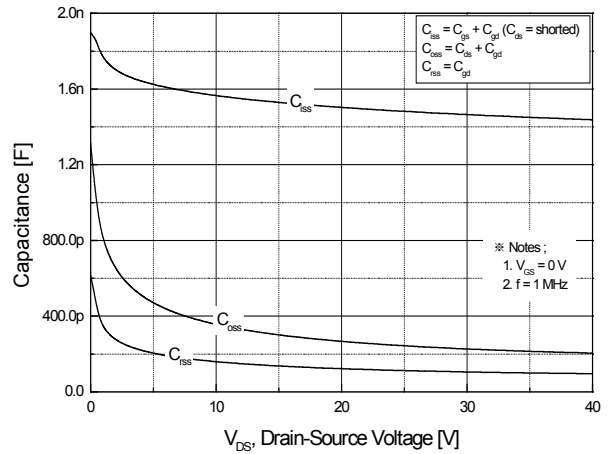
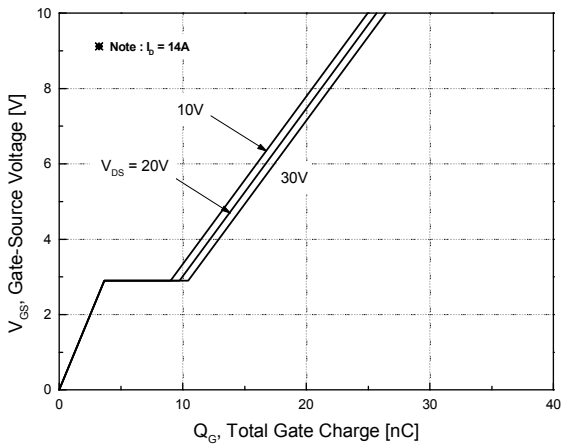


Fig.6 Body Diode Forward Voltage Variation with Source Current and Temperature



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