

General Description

The MDP14N25C is produced using advanced MagnaChip's MOSFET Technology, which provides low on-state resistance, high switching performance and excellent quality.

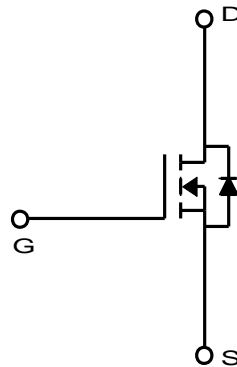
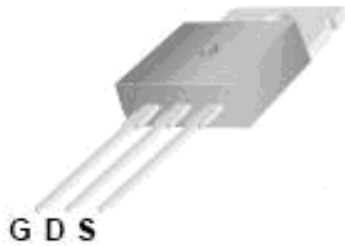
These devices are suitable device for SMPS, high Speed switching and general purpose applications.

Features

- $V_{DS} = 250V$
- $I_D = 14A$ @ $V_{GS} = 10V$
- $R_{DS(ON)} \leq 0.28\Omega$ @ $V_{GS} = 10V$

Applications

- Power Supply
- Motor Control
- High Current, High Speed Switching



Absolute Maximum Ratings (Ta = 25°C)

Characteristics		Symbol	Rating	Unit
Drain-Source Voltage		V_{DSS}	250	V
Gate-Source Voltage		V_{GSS}	±30	V
Continuous Drain Current	$T_C=25^\circ C$	I_D	14	A
	$T_C=100^\circ C$		8.8	A
Pulsed Drain Current ⁽¹⁾		I_{DM}	56	A
Power Dissipation	$T_C=25^\circ C$	P_D	126.3	W
	Derate above 25 °C		1.01	W/°C
Repetitive Avalanche Energy ⁽¹⁾		E_{AR}	12.6	mJ
Peak Diode Recovery dv/dt ⁽³⁾		dv/dt	4.5	V/ns
Single Pulse Avalanche Energy ⁽⁴⁾		E_{AS}	550	mJ
Junction and Storage Temperature Range		T_J, T_{stg}	-55~150	°C

Thermal Characteristics

Characteristics	Symbol	Rating	Unit
Thermal Resistance, Junction-to-Ambient ⁽¹⁾	$R_{\theta JA}$	62.5	°C/W
Thermal Resistance, Junction-to-Case ⁽¹⁾	$R_{\theta JC}$	0.99	

Ordering Information

Part Number	Temp. Range	Package	Packing	RoHS Status
MDP14N25CTH	-55~150°C	TO-220	Tube	Halogen Free
MDP14N25CTP	-55~150°C	TO-220	Tube	Pb Free

Electrical Characteristics (Ta =25°C)

Characteristics	Symbol	Test Condition	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$I_D = 250\mu A, V_{GS} = 0V$	250	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	2.0	-	4.0	
Drain Cut-Off Current	I_{DSS}	$V_{DS} = 250V, V_{GS} = 0V$	-	-	1	μA
Gate Leakage Current	I_{GSS}	$V_{GS} = \pm 30V, V_{DS} = 0V$	-	-	100	nA
Drain-Source ON Resistance	$R_{DS(ON)}$	$V_{GS} = 10V, I_D = 7A$	-	0.22	0.28	Ω
Forward Transconductance	g_{fs}	$V_{DS} = 40V, I_D = 7A$	-	9.2	-	S
Dynamic Characteristics						
Total Gate Charge	Q_g	$V_{DS} = 200V, I_D = 14.0A, V_{GS} = 10V^{(3)}$	-	20	-	nC
Gate-Source Charge	Q_{gs}		-	4.5	-	
Gate-Drain Charge	Q_{gd}		-	8.9	-	
Input Capacitance	C_{iss}	$V_{DS} = 25V, V_{GS} = 0V, f = 1.0MHz$	-	741	-	pF
Reverse Transfer Capacitance	C_{rss}		-	15	-	
Output Capacitance	C_{oss}		-	142	-	
Turn-On Delay Time	$t_{d(on)}$	$V_{GS} = 10V, V_{DS} = 125V, I_D = 14.0A, R_G = 25\Omega^{(3)}$	-	13	-	ns
Rise Time	t_r		-	42	-	
Turn-Off Delay Time	$t_{d(off)}$		-	44	-	
Fall Time	t_f		-	28	-	
Drain-Source Body Diode Characteristics						
Maximum Continuous Drain to Source Diode Forward Current	I_S		14	-	-	A
Source-Drain Diode Forward Voltage	V_{SD}	$I_S = 14.0A, V_{GS} = 0V$	-	-	1.4	V
Body Diode Reverse Recovery Time	t_{rr}	$I_F = 14.0A, di/dt = 100A/\mu s^{(3)}$	-	240	-	ns
Body Diode Reverse Recovery Charge	Q_{rr}		-	1.96	-	μC

Note :

- Pulse width is based on $R_{\theta JC}$ & $R_{\theta JA}$ and the maximum allowed junction temperature of 150°C.
- Pulse test: pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$, pulse width limited by junction temperature $T_{J(MAX)}=150^\circ C$.
- $I_{SD} \leq 6.0A$, $di/dt \leq 200A/\mu s$, $V_{DD} \leq BV_{dss}$, $R_G = 25\Omega$, Starting $T_J = 25^\circ C$
- $L = 4.5mH$, $I_{AS} = 14.0A$, $V_{DD} = 50V$, $R_G = 25\Omega$, Starting $T_J = 25^\circ C$

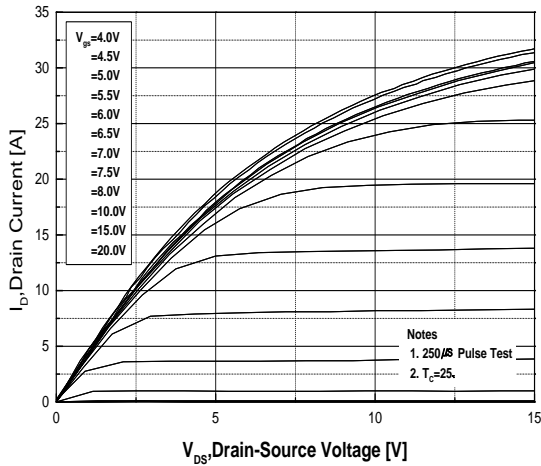


Fig.1 On-Region Characteristics

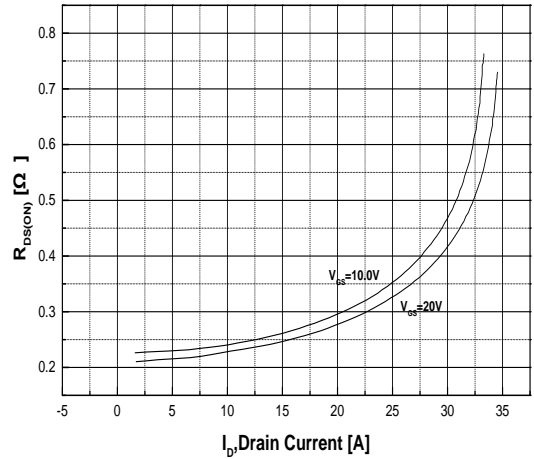


Fig.2 On-Resistance Variation with Drain Current and Gate Voltage

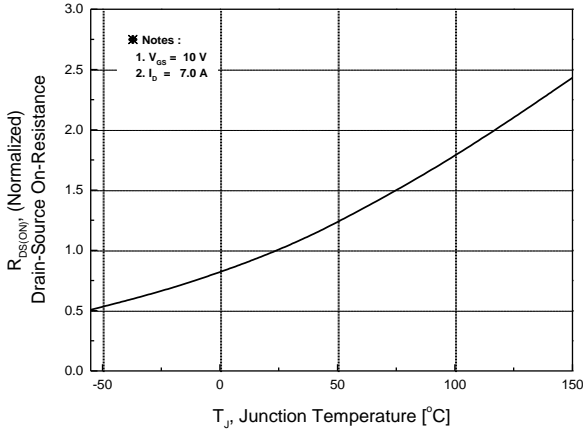


Fig.3 On-Resistance Variation with Temperature

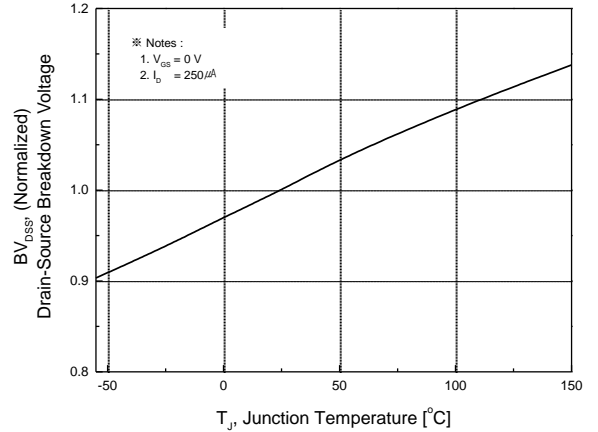


Fig.4 Breakdown Voltage Variation vs. Temperature

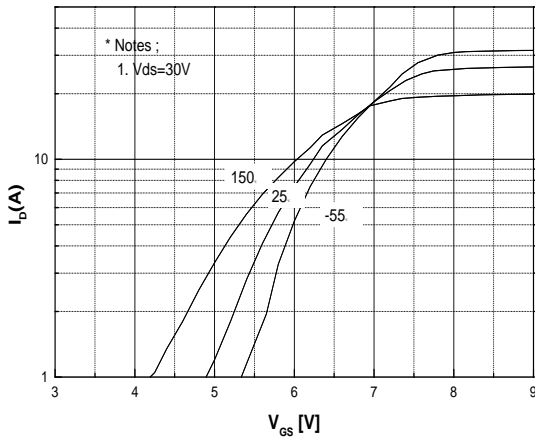


Fig.5 Transfer Characteristics

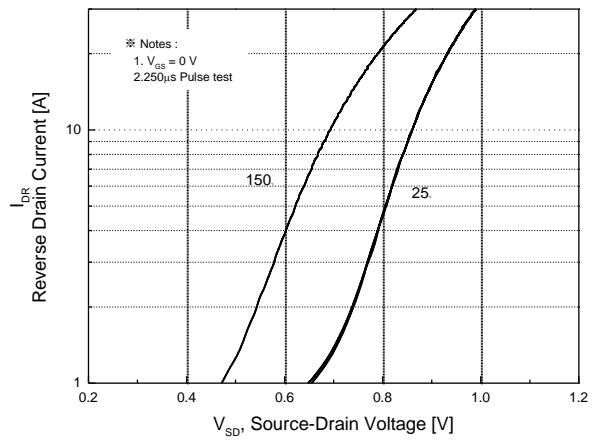
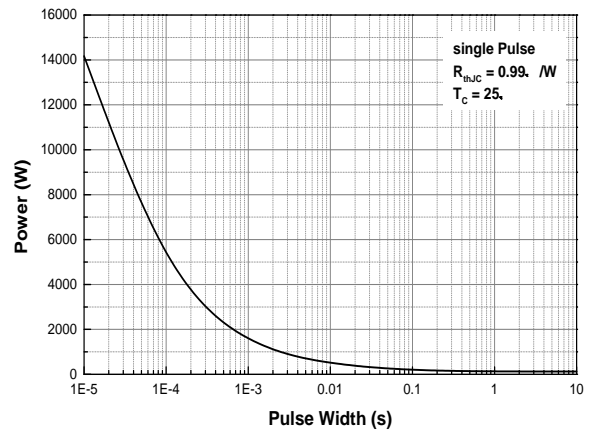
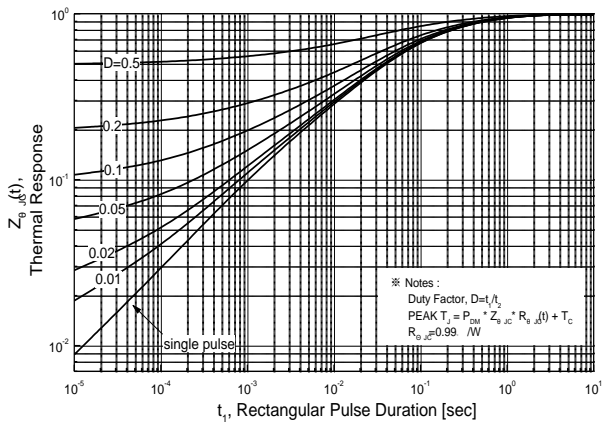
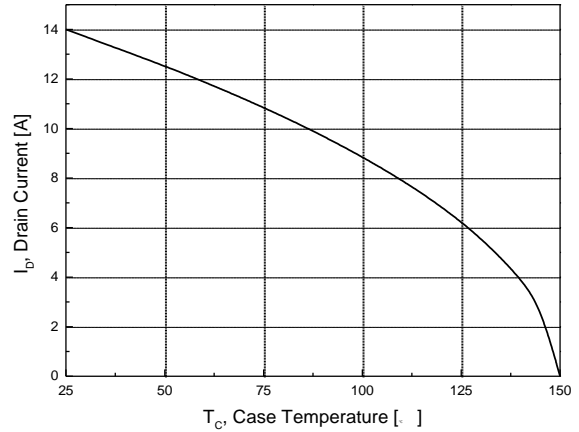
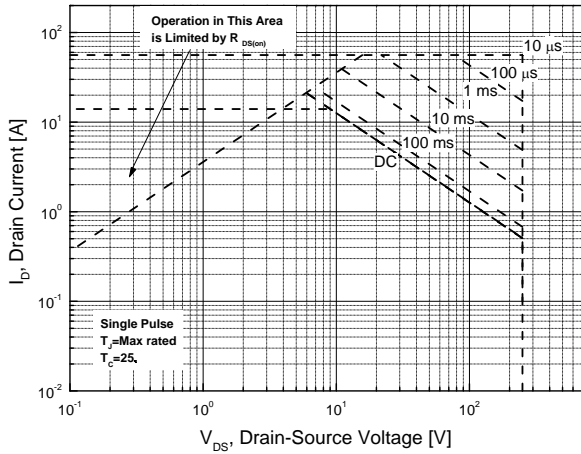
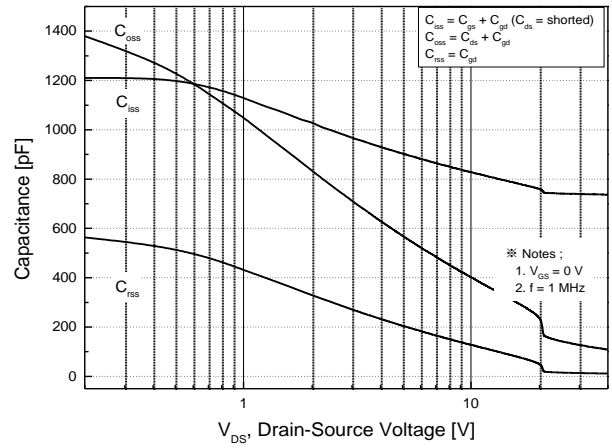
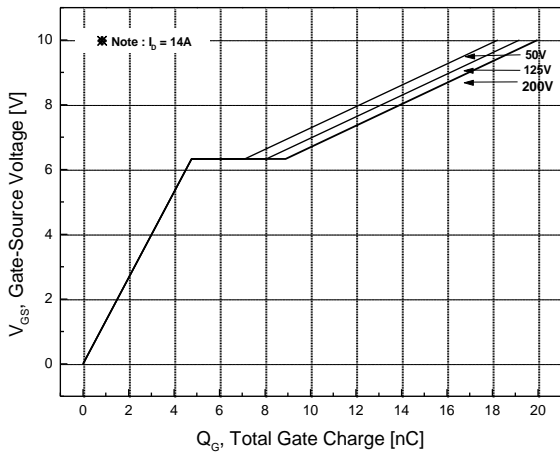


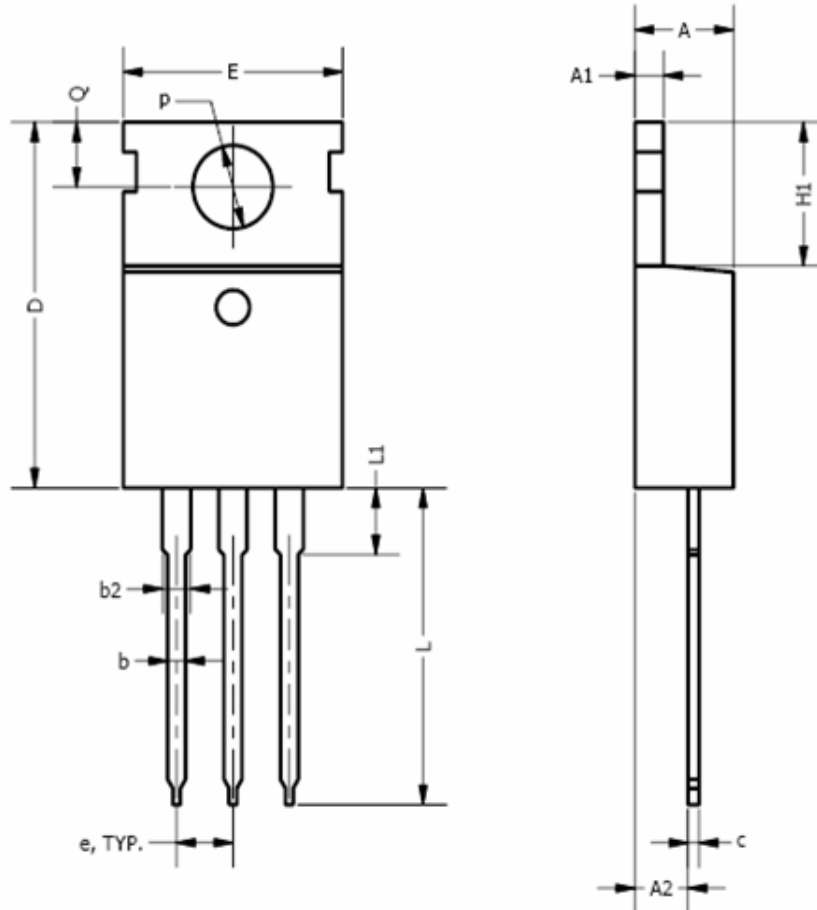
Fig.6 Body Diode Forward Voltage Variation with Source Current and Temperature



Physical Dimensions

3 Leads, TO-220

Dimensions are in millimeters unless otherwise specified



Symbol	Min	Nom	Max
A	3.56		4.83
A1	0.50		1.40
A2	2.03		2.92
b	0.38	0.69	1.02
b2	1.14	1.45	1.78
c	0.36		0.61
D	14.22		16.51
e	2.54 TYP		
E	9.65		10.67
H1	5.84		6.86
L	12.70		14.73
L1			6.35
ϕP	3.53		4.09
Q	2.54		3.43

DISCLAIMER:

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