



MDVB20N085EURH

Single N-channel Trench MOSFET 20V 8.5mΩ 26A

FEATURES

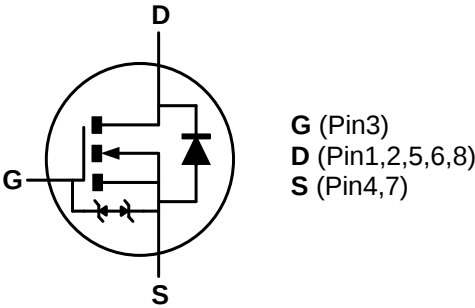
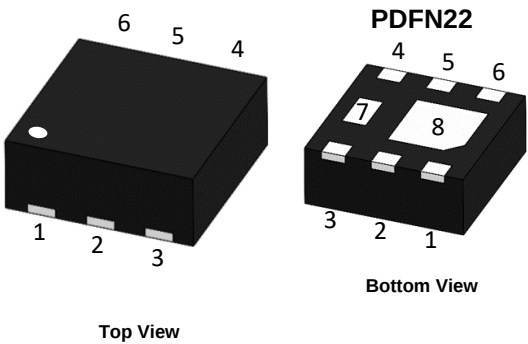
- SSCFET® I: Super-Short Channel FET I technology
- N-channel, logic level
- Enhanced avalanche ruggedness
- 100% Avalanche tested
- 100% Rg tested
- Maximum 150°C junction temperature

APPLICATIONS

- E-Cigarette
- General Purpose Switch
- DC-DC Conversion

KEY PERFORMANCE PARAMETERS

V_{DS}	20	V
$R_{DS(on), typ.}$	6.5	mΩ
$R_{DS(on), max.}$	8.5	mΩ
I_D	26	A
Q_g	20	nC
Junction temperature _{, max}	150	°C



ORDERING INFORMATION

Type / Ordering Code	Package	Marking	Packing	RoHS Status
MDVB20N085EURH	PDFN22	2085	Tape & Reel	Halogen Free

<http://www.magnachip.com/>

ABSOLUTE MAXIMUM RATINGS (T_C = 25°C, unless otherwise specified)

Parameter		Symbol	Rating	Unit
Drain-source Voltage		V _{DS}	20	V
Gate-source Voltage		V _{GS}	± 12	
Drain current	T _C =25°C	I _D	26	A
	T _C =100°C		16	
	T _A =25°C	I _D	15	
	T _A =100°C		10	
¹⁾ Pulsed drain current	T _C =25°C	I _{DM}	104	
Total power dissipation	T _C =25°C	P _{tot}	8	W
	T _C =100°C		3	
	T _A =25°C	P _{tot}	2.9	
	T _A =100°C		1.2	
Operating and storage temperature		T _j , T _{stg}	- 55 ~ 150	°C

THERMAL CHARACTERISTICS

Parameter	Symbol	Rating	Unit
²⁾ Thermal resistance, junction - case	R _{θJC}	15	°C/W
²⁾ Thermal resistance, junction - ambient	R _{θJA}	43	

ELECTRICAL CHARACTERISTICS ($T_j = 25^\circ\text{C}$, unless otherwise specified)**STATIC CHARACTERISTICS**

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions / Note
Drain-source breakdown voltage	$V_{(BR)DSS}$	20	-	-	V	$V_{GS}=0\text{ V}$, $I_D=250\text{ }\mu\text{A}$
Gate threshold voltage	$V_{GS(th)}$	0.40	-	1.20	V	$V_{DS}=V_{GS}$, $I_D=250\text{ }\mu\text{A}$
Zero gate voltage drain current	I_{DSS}	-	-	1	μA	$V_{DS}=16\text{ V}$, $V_{GS}=0\text{ V}$
Gate-source leakage current	I_{GSS}	-	-	± 10	μA	$V_{GS}=\pm 12\text{ V}$, $V_{DS}=0\text{ V}$
Drain-source on-state resistance	$R_{DS(on)}$	-	6.5	8.5	m Ω	$V_{GS}=4.5\text{ V}$, $I_D=8.5\text{ A}$
		-	7.6	15.0		$V_{GS}=2.5\text{ V}$, $I_D=8.5\text{ A}$
		-	11.0	30.0		$V_{GS}=1.8\text{ V}$, $I_D=5.0\text{ A}$
³⁾ Gate resistance	R_g	-	4.0	-	Ω	f=1 MHz

³⁾ DYNAMIC CHARACTERISTICS

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions / Note
Input capacitance	C_{iss}	-	1,561	-	pF	$V_{GS}=0\text{ V}$, $V_{DS}=10\text{ V}$, f=1 MHz
Output capacitance	C_{oss}	-	478	-		
Reverse transfer capacitance	C_{rss}	-	451	-		
Turn-on delay time	$t_{d(on)}$	-	8	-	ns	$V_{DD}=10\text{ V}$, $V_{GS}=10\text{ V}$, $I_D=8.5\text{ A}$, $R_{G,ext}=2\text{ }\Omega$
Rise time	t_r	-	10	-		
Turn-off delay time	$t_{d(off)}$	-	51	-		
Fall time	t_f	-	22	-		

³⁾ GATE CHARGE CHARACTERISTICS

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions / Note
Gate to source charge	Q_{gs}	-	3	-	nC	$V_{DD}=10\text{ V}$, $I_D=8.5\text{ A}$, $V_{GS}=0\text{ to }10\text{ V}$
Gate charge at threshold	$Q_{gs(th)}$	-	1	-		
Gate to drain charge	Q_{gd}	-	7	-		
Switching charge	Q_{sw}	-	9	-		
Gate charge total	$Q_{g@10V}$	-	34	-		
	$Q_{g@4.5V}$	-	20	-		
Gate plateau voltage	$V_{plateau}$	-	1.3	-	V	

SOURCE-DRAIN DIODE

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions / Note
³⁾ Diode continuous forward current	I_S	-	-	26	A	-
³⁾ Diode pulse current	$I_{S,pulse}$	-	-	102	A	pulsed; $t_p \leq 10\text{ }\mu\text{s}$
Diode forward voltage	V_{SD}	-	0.75	1.2	V	$V_{GS}=0\text{ V}$, $I_F=8.5\text{ A}$
³⁾ Reverse recovery time	t_{rr}	-	35	-	ns	$I_F=8.5\text{ A}$, $dI_F/dt=100\text{ A}/\mu\text{s}$
³⁾ Reverse recovery charge	Q_{rr}	-	26	-	nC	

Notes

1. Pulse width limited by T_{jmax}
2. Surface mounted FR-4 board by JEDEC (jesd51-7)
3. The parameter is not subject to production testing - guaranteed by design.

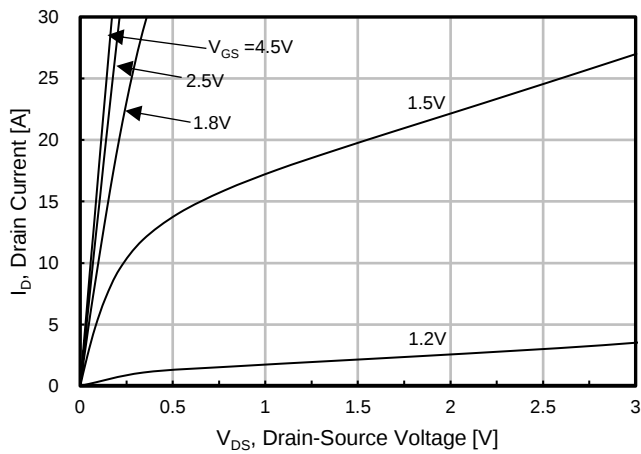
Electrical Characteristics Diagrams ($T_J = 25^\circ\text{C}$, unless otherwise specified)

Fig. 1. Output Characteristics

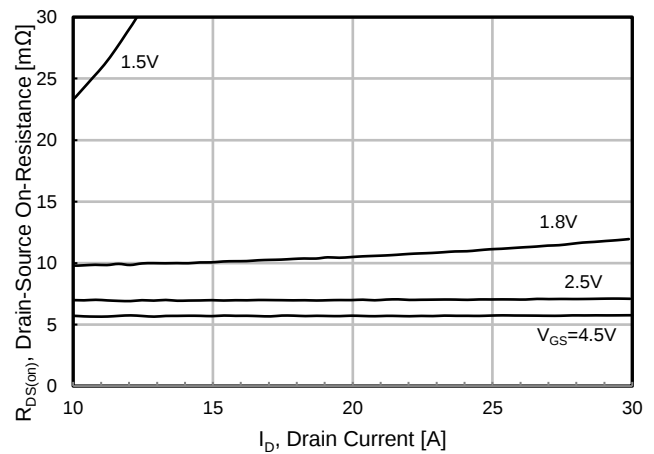


Fig. 2. Static On-Resistance Variation

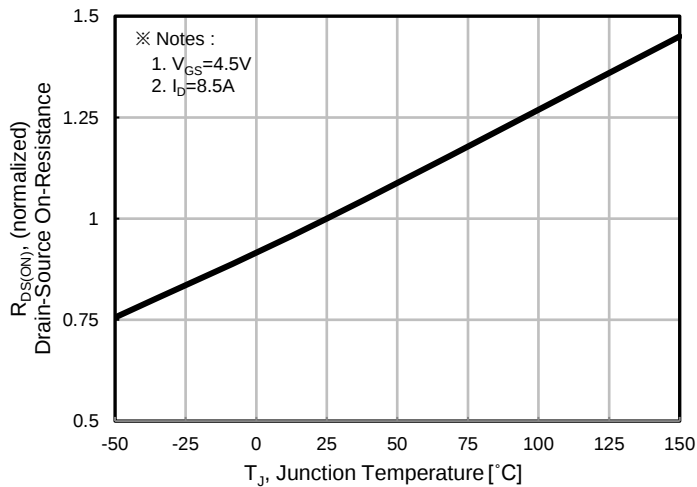


Fig. 3. On-Resistance vs. Junction Temperature

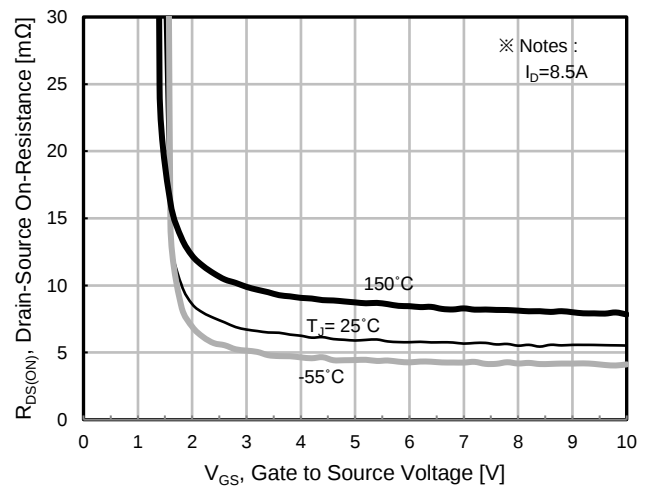


Fig. 4. On-Resistance vs. Gate to source Voltage

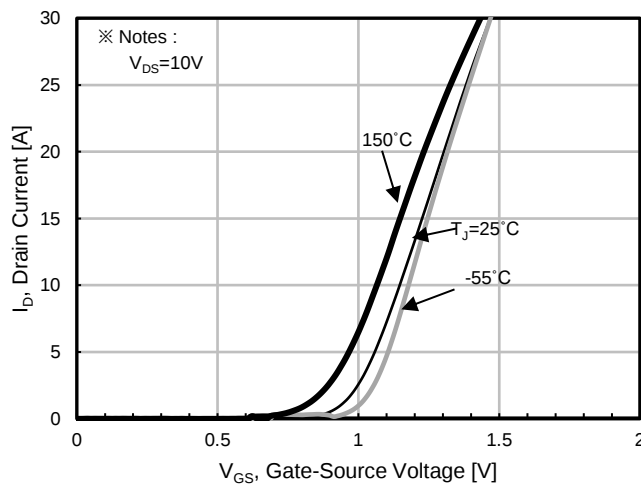


Fig. 5. Transfer Characteristics

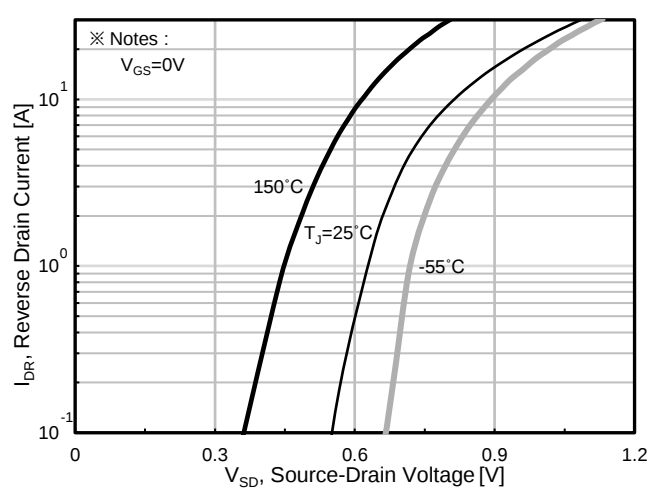


Fig. 6. Body Diode Forward Voltage Variation with Source Current and Temperature

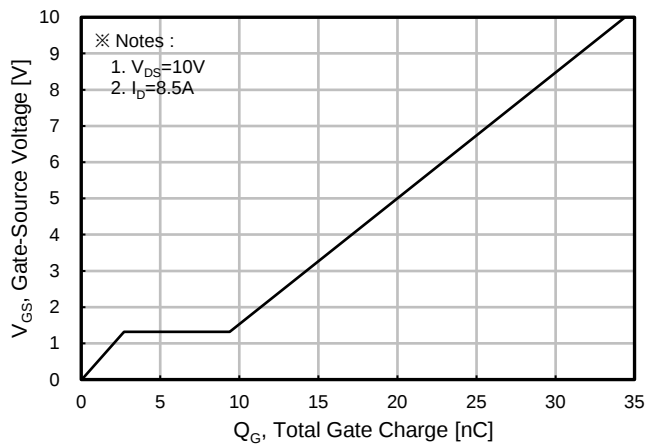
Electrical Characteristics Diagrams ($T_J = 25^\circ\text{C}$, unless otherwise specified)

Fig. 7. Gate Charge

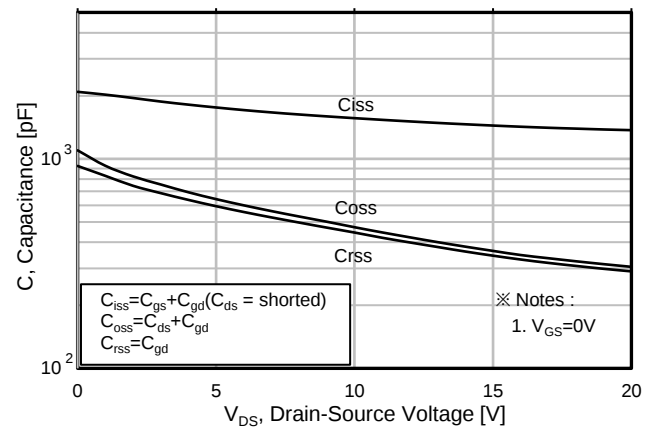


Fig. 8. Capacitance

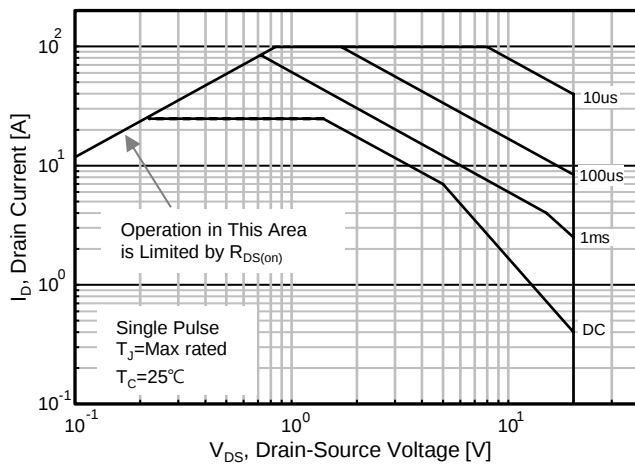


Fig. 9. Safe Operating Area, Junction-to-Ambient

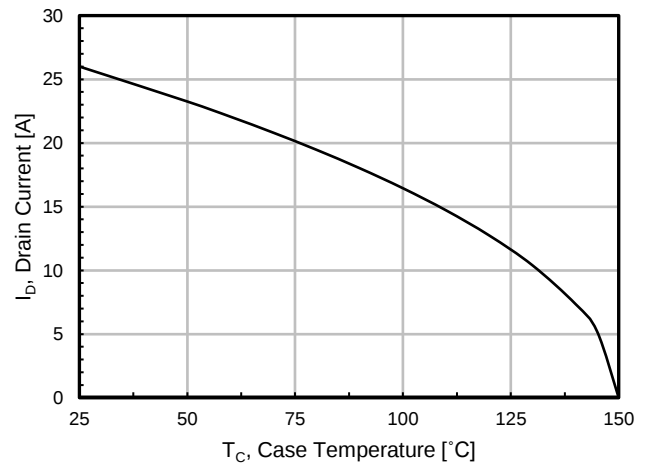


Fig. 10. Maximum Drain vs. Case Temperature

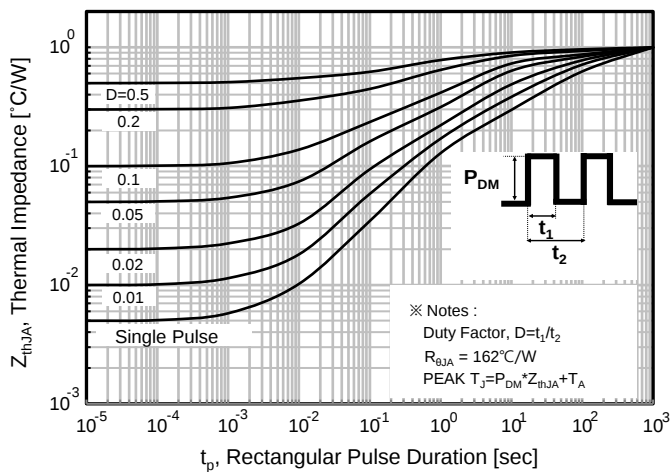
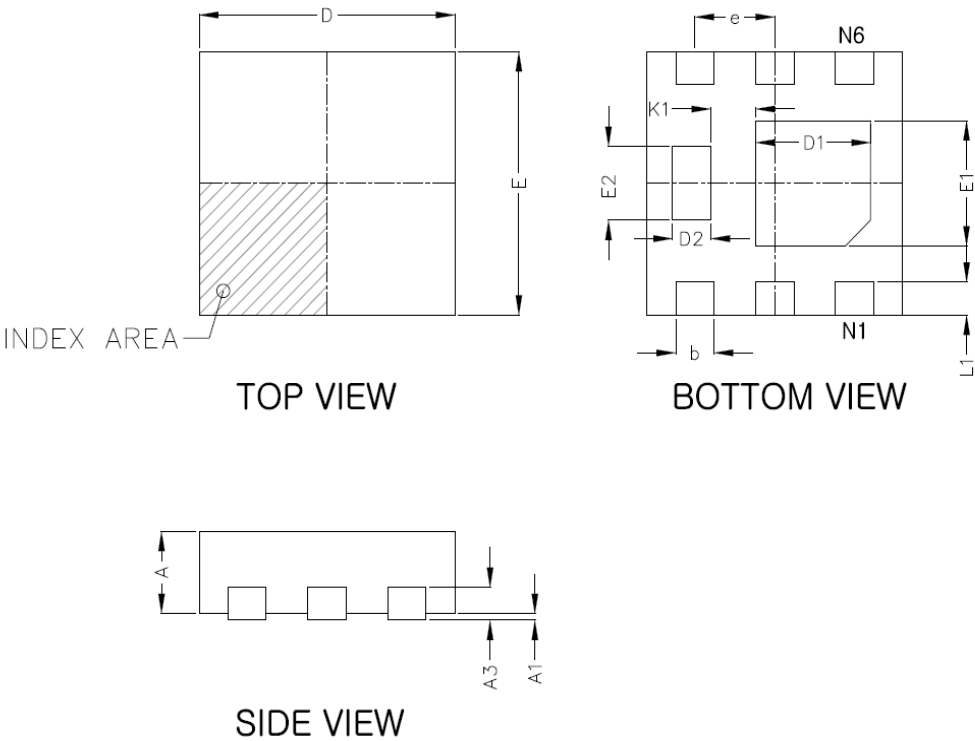


Fig. 11. Transient Thermal Impedance

Package Outlines

PDFN22



SYMBOL	DIMENSION [mm]		
	MIN	NOM	MAX
A	0.70		0.80
A1	0.00		0.05
A3		0.203	
b	0.250		0.350
D	1.900		2.100
D1	0.800		1.000
D2	0.200		0.400
E	1.900		2.100
E1	0.850		1.050
E2	0.460		0.660
e		0.650BSC	
K		0.275	
K1		0.350	
L	0.174		0.326

Notes

Package body size, length and width do not include mold flash, protrusions and gate burrs.

DISCLAIMER :

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