

-40V_{DS}/±20V_{GS} P-Channel Enhancement Mode MOSFET

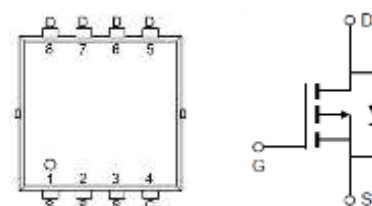
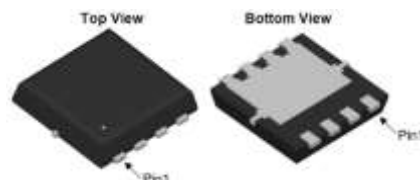
Features

- V_{DS}=-40V, I_D=-38A
- R_{DS(ON)}=15mΩ (TYP.) V_{GS}=-10V
- Reliable and Rugged
- Avalanche Rated
- Low On-Resistance
- High Current Capability

Applications

- Load Switch
- Power management in portable/desktop PCs
- DC/DC conversion

PDFN3333



Ordering Information

Device	package	Device Marking	Package Qty.
ESN4485	PDFN3*3	ESN4485	5000/PCS

Absolute Maximum Ratings (T_C=25°C, unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage (V _{GS} =0V)	V _{DS}	-40	V
Gate-Source Voltage (V _{GS} =0V, static)	V _{GS}	±20	V
Continuous Drain Current (T _C =25°C)	I _D	-38	A
Continuous Drain Current (T _C =100°C)		-24	A
Pulsed Drain Current	I _{DM}	-120	A
Avalanche Energy, Single Pulsed	E _{AS}	130	mJ
Maximum Power Dissipation (T _C =25°C)	P _D	52	W
Operating, Storage Temperature Range	T _J , T _{STG}	-55~150	°C

Electrical Characteristics

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =-250μA	-40	-	-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =-30V, V _{GS} =0V	-	-	-1	μA
Gate -Source Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D =-250μA	-	-	-2.5	V
Drain-Source On-stage Resistance	R _{DS(ON)}	V _{GS} =-10V, I _D =-1A	-	-	17	mΩ
		V _{GS} =-4.5V, I _D =-1A	-	-	25	

Thermal Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal Resistance,Junction-to-Case	$R_{\theta JC}$	-	2.4	-	$^{\circ}\text{C}/\text{W}$
Thermal Resistance,Junction-to-Ambient	$R_{\theta JA}$	-	62	-	$^{\circ}\text{C}/\text{W}$

Dynamic Characteristics

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Input capacitance	C_{iss}	$V_{DS}=-15\text{V}$	-	2757	-	pF
Output capacitance	C_{oss}	$V_{GS}=0\text{V}$	-	240	-	
Reverse transfer capacitance	C_{rss}	$f=1\text{MHz}$	-	137	-	
Gate Resistance	R_g	$f=1\text{MHz}$	-	-	-	Ω
Total Gate Charge	Q_g	$V_{DS}=-15\text{V}$	-	22.2	-	nC
Gate Source Charge	Q_{gs}	$V_{GS}=-10\text{V}$	-	8.2	-	
Gate Drain Charge	Q_{gd}	$I_D=-15\text{A}$	-	8.8	-	
Turn-on delay Time	$t_{d(on)}$	$V_{GS}=-10\text{V}$	-	23	-	ns
Rise time	t_r	$V_{DS}=-15\text{V}$	-	10	-	
Turn-off delay Time	$t_{d(off)}$	$R_L=1\Omega$	-	135	-	
Fall time	t_f	$R_G=3\Omega$	-	46	-	

Reverse Diode Characteristics

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Body Diode Forward Voltage	V_{SD}	$V_{GS}=0\text{V}, I_{SD}=-1\text{A}$	-	--	-1	V
Reverse Recovery Time	t_{rr}	$V_{GS}=0\text{V}, I_{SD}=-15\text{A}$	-	-	-	ns
Reverse Recovery Charge	Q_{rr}	$dI/dt=100\text{A}/\mu\text{s}$	-	-	-	nC

Electrical Characteristics Diagrames

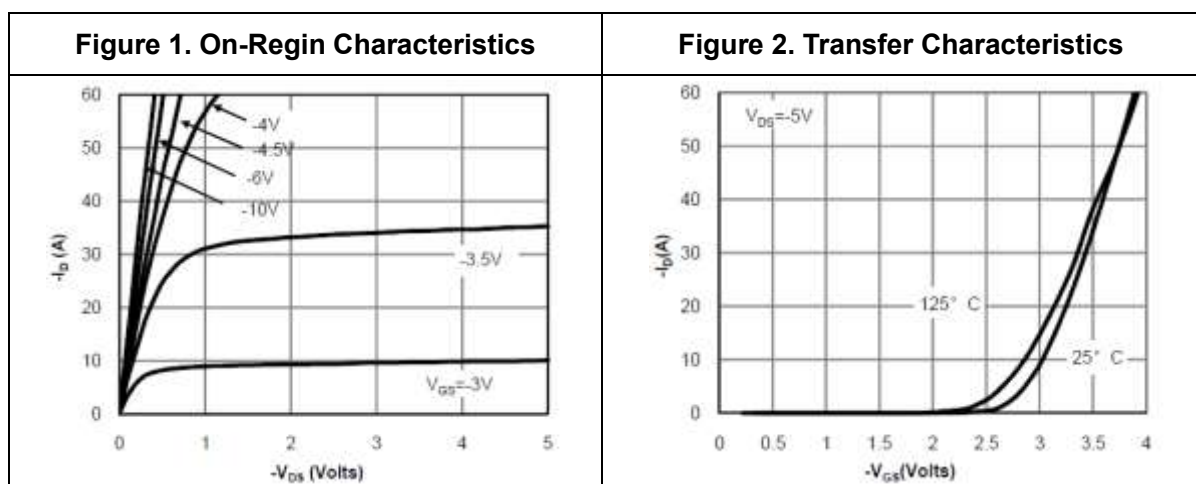


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

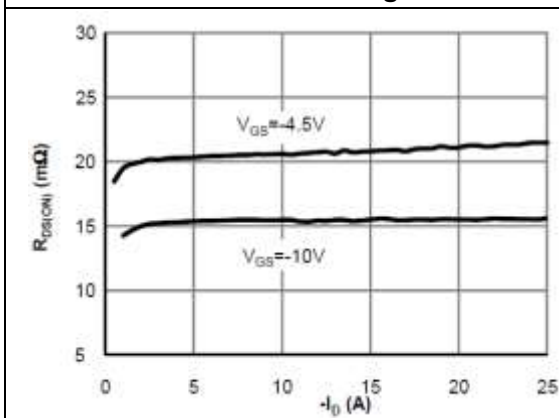


Figure 4. On-Resistance vs. Junction Temperature

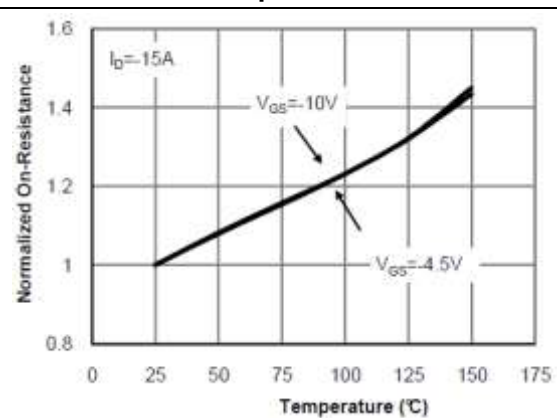


Figure 5. On-Resistance vs. Gate-Source Voltage

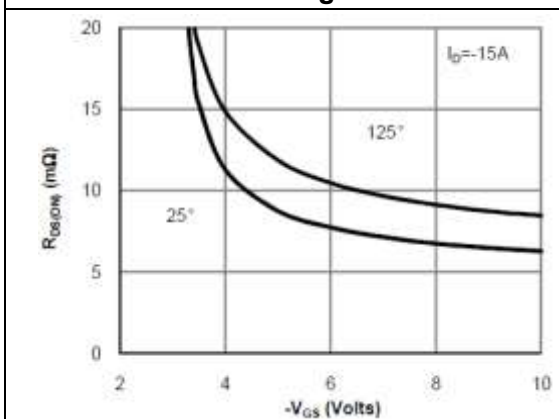


Figure 6. Body-Diode Characteristics

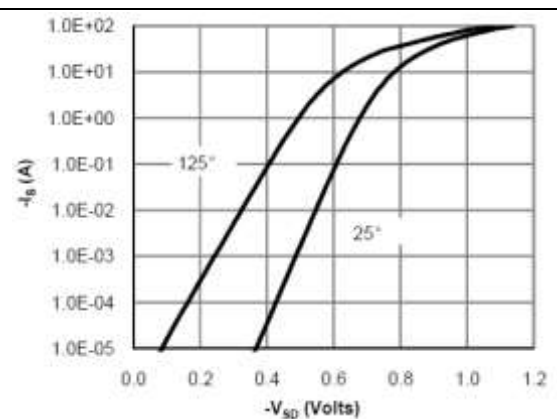


Figure 7. Gate-Charge Characteristics

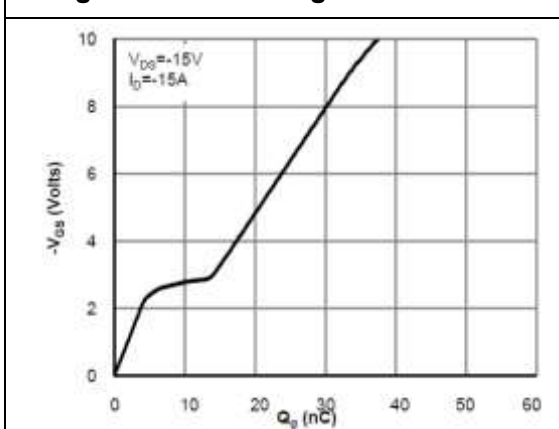


Figure 8. Capacitance Characteristics

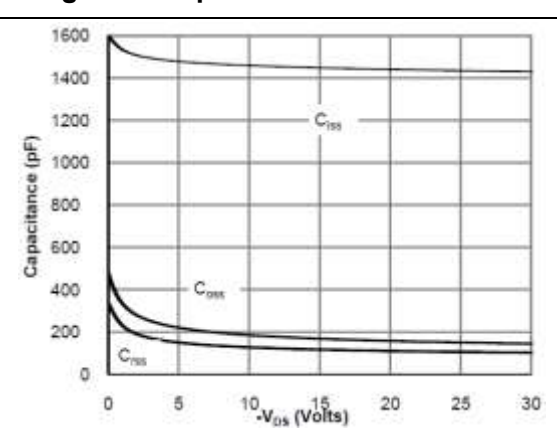


Figure 9. Maximum Forward Biased Safe Operating Area

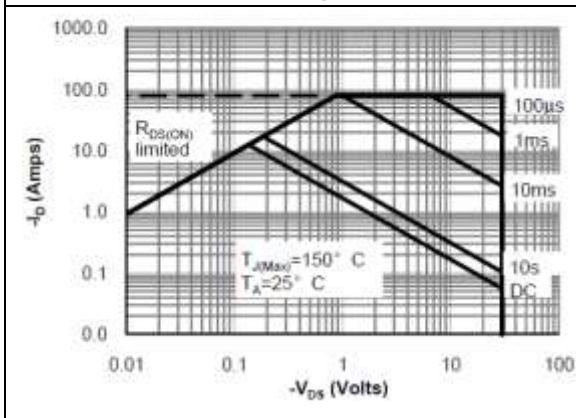


Figure 10. Single Pulse Power Rating Junction-to-Ambient

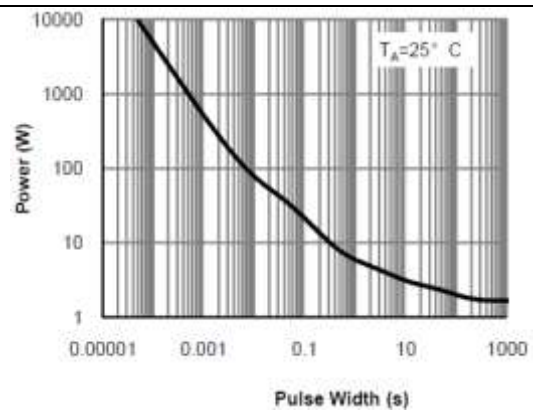
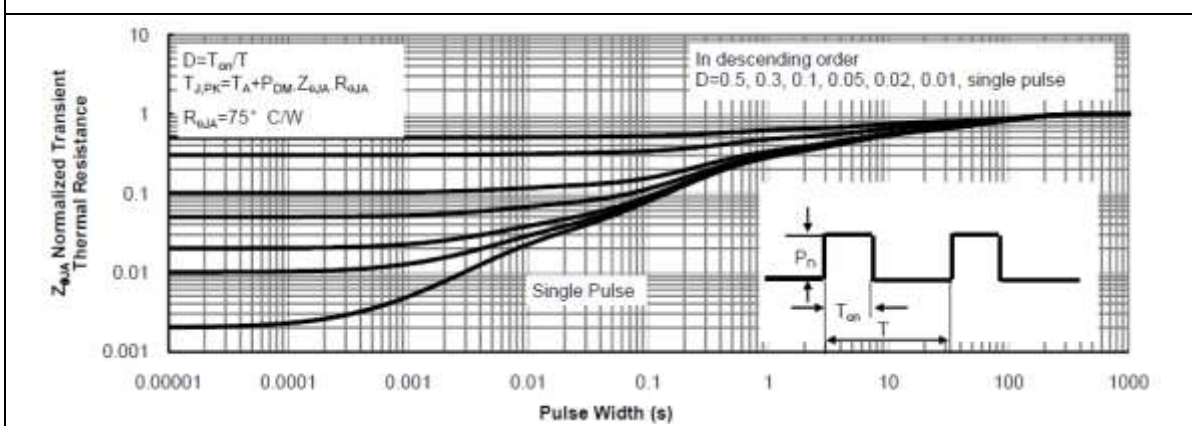
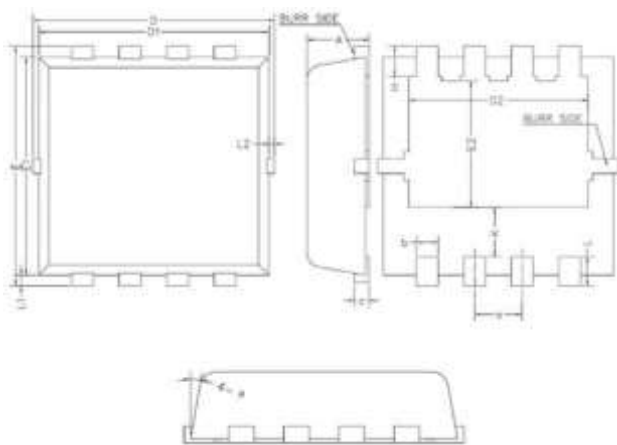


Figure 11. Normalized Maximum Transient Thermal Impedance



Physical Dimensions

PDFN3*3



符号	尺寸 (mm)			符号	尺寸 (mm)		
	最小值	典型值	最大值		最小值	典型值	最大值
A	0.70	0.80	0.90	E1	2.90	3.00	3.10
b	0.25	0.30	0.35	E2	1.64	1.74	1.84
c	0.14	0.15	0.20	H	0.32	0.42	0.52
D	3.10	3.30	3.50	K	0.59	0.69	0.79
D1	3.05	3.15	3.25	L	0.25	0.40	0.55
D2	2.35	2.45	2.55	L1	0.10	0.15	0.20
e	0.55	0.65	0.75	L2	-	-	0.15
E	3.10	3.30	3.50	θ	8°	10°	12°

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