

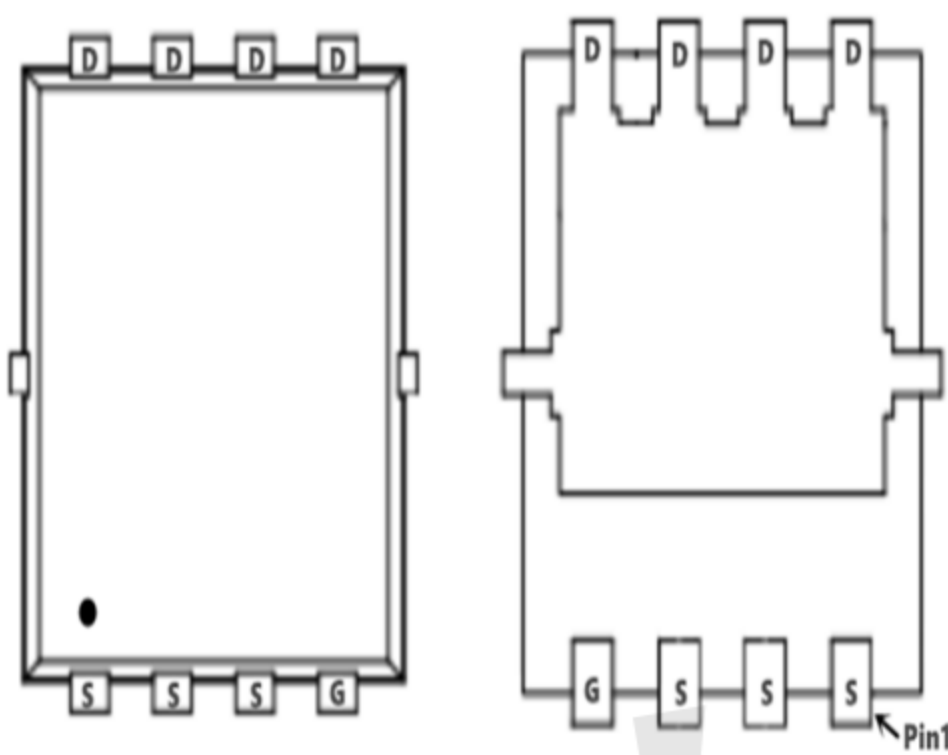
**Product Summary**

V <sub>DS</sub> (V)	R <sub>DS(on)</sub> (mΩ)	I <sub>D</sub> (A)
60	2.5 at V <sub>GS</sub> = 10 V	130
	3.5 at V <sub>GS</sub> = 4.5 V	105

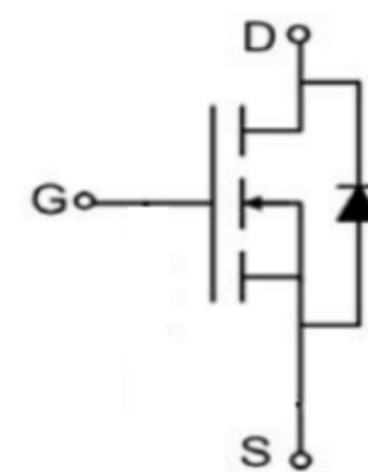
**Applications**

- ◆ Load/Power switch
- ◆ Interfacing, logic switching
- ◆ Battery management for ultra portable electronics

**Package and Pin Configuration**



**Circuit diagram**



**PDFN5\*6-8L**

**Absolute Maximum Ratings** T<sub>C</sub>=25°C unless otherwise noted

Symbol	Parameter	Rating	Units
V <sub>DS</sub>	Drain-Source Voltage	60	V
V <sub>GS</sub>	Gate-Source Voltage	±20	V
I <sub>D</sub>	Drain Current – Continuous (T <sub>C</sub> =25°C)	130	A
	Drain Current – Continuous (T <sub>C</sub> =100°C)	76	A
I <sub>DM</sub>	Drain Current – Pulsed <sup>1</sup>	350	A
P <sub>D</sub>	Power Dissipation (T <sub>C</sub> =25°C)	120	W
	Power Dissipation – Derate above 25°C	10	W/°C
T <sub>STG</sub>	Storage Temperature Range	-55 to 150	°C
T <sub>J</sub>	Operating Junction Temperature Range	-55 to 150	°C

**Thermal Characteristics**

Symbol	Parameter	Typ.	Max.	Unit
R <sub>θJA</sub>	Thermal Resistance Junction to ambient	---	62	°C/W
R <sub>θJC</sub>	Thermal Resistance Junction to Case	---	0.9	°C/W

**Electrical Characteristics (T<sub>J</sub>=25 °C, unless otherwise noted)**  
**Off Characteristics**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V , I <sub>D</sub> =250uA	60	---	---	V
ΔBV <sub>DSS</sub> /ΔT <sub>J</sub>	BV <sub>DSS</sub> Temperature Coefficient	Reference to 25°C , I <sub>D</sub> =1mA	---	0.01	---	V/°C
I <sub>DSS</sub>	Drain-Source Leakage Current	V <sub>DS</sub> =60V , V <sub>GS</sub> =0V , T <sub>J</sub> =25°C	---	---	1	uA
		V <sub>DS</sub> =60V , V <sub>GS</sub> =0V , T <sub>J</sub> =125°C	---	---	10	uA
I <sub>GSS</sub>	Gate-Source Leakage Current	V <sub>GS</sub> =±20V , V <sub>DS</sub> =0V	---	---	±100	nA

**On Characteristics**

R <sub>DS(ON)</sub>	Static Drain-Source On-Resistance	V <sub>GS</sub> =10V , I <sub>D</sub> =15A	---	2.5	3.3	mΩ
		V <sub>GS</sub> =4.5V , I <sub>D</sub> =10A	---	3.5	5.0	mΩ
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =250uA	1.0	1.6	2.5	V
ΔV <sub>GS(th)</sub>	V <sub>GS(th)</sub> Temperature Coefficient		---	1.6	---	mV/°C
g <sub>fs</sub>	Forward Transconductance	V <sub>DS</sub> =10V , I <sub>S</sub> =15A	---	35	---	S

**Dynamic and switching Characteristics**

Q <sub>g</sub>	Total Gate Charge <sup>2, 3</sup>	V <sub>DS</sub> =30V , V <sub>GS</sub> =10V , I <sub>D</sub> =10A	---	30	---	nC
Q <sub>gs</sub>	Gate-Source Charge <sup>2, 3</sup>		---	9.6	---	
Q <sub>gd</sub>	Gate-Drain Charge <sup>2, 3</sup>		---	9.1	---	
T <sub>d(on)</sub>	Turn-On Delay Time <sup>2, 3</sup>	V <sub>DS</sub> =30V , V <sub>GS</sub> =10V , R <sub>G</sub> =3.3Ω I <sub>D</sub> =10A	---	23	---	ns
T <sub>r</sub>	Rise Time <sup>2, 3</sup>		---	7.2	---	
T <sub>d(off)</sub>	Turn-Off Delay Time <sup>2, 3</sup>		---	80	---	
T <sub>f</sub>	Fall Time <sup>2, 3</sup>		---	26	---	
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =20V , V <sub>GS</sub> =0V , F=1MHz	---	5377	---	pF
C <sub>oss</sub>	Output Capacitance		---	1670	---	
C <sub>rss</sub>	Reverse Transfer Capacitance		---	78	---	

**Drain-Source Diode Characteristics and Maximum Ratings**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I <sub>S</sub>	Continuous Source Current	V <sub>G</sub> =V <sub>D</sub> =0V , Force Current	---	---	130	A
I <sub>SM</sub>	Pulsed Source Current		---	---	250	A
V <sub>SD</sub>	Diode Forward Voltage	V <sub>GS</sub> =0V , I <sub>S</sub> =1A , T <sub>J</sub> =25°C	---	---	1.3	V

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.
3. Essentially independent of operating temperature.



**Typical Electrical and Thermal Characteristic Curves**

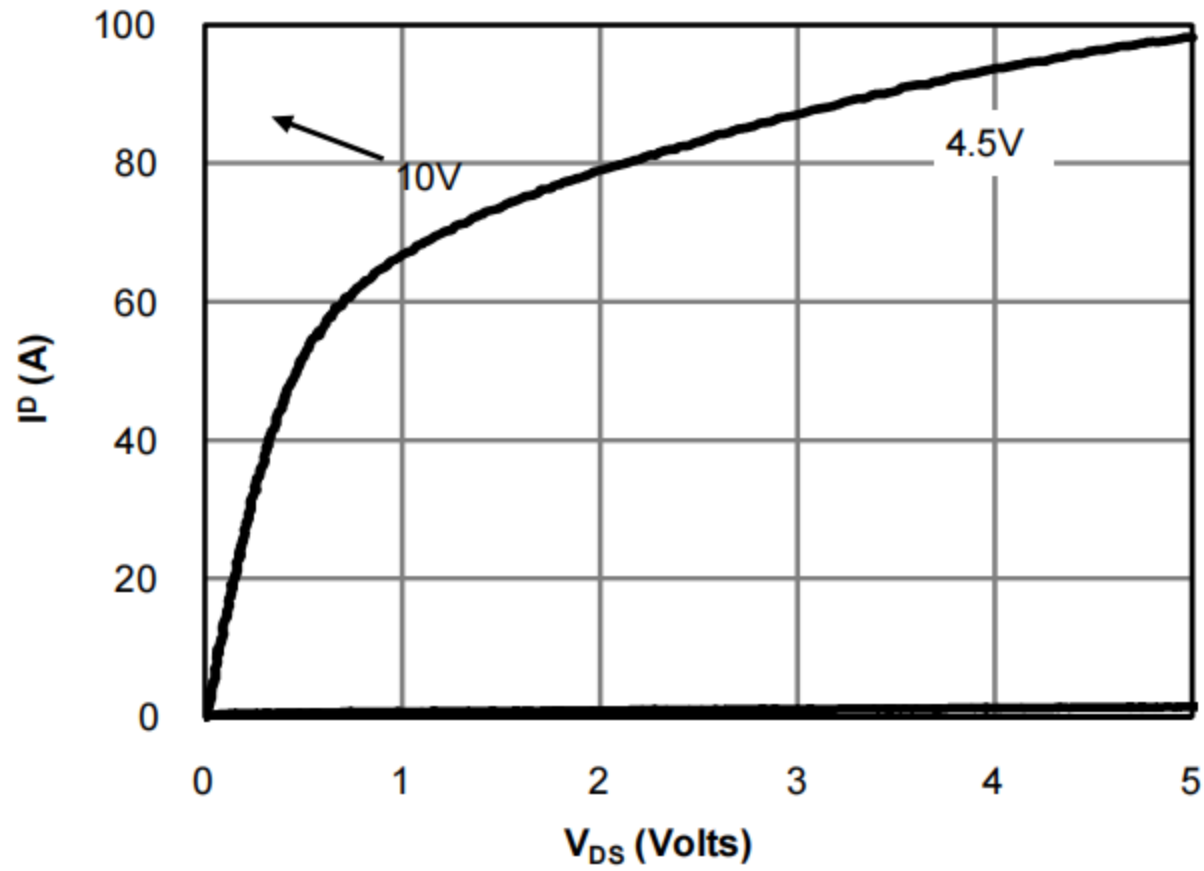


Fig 1: On-Region Characteristics (Note E)

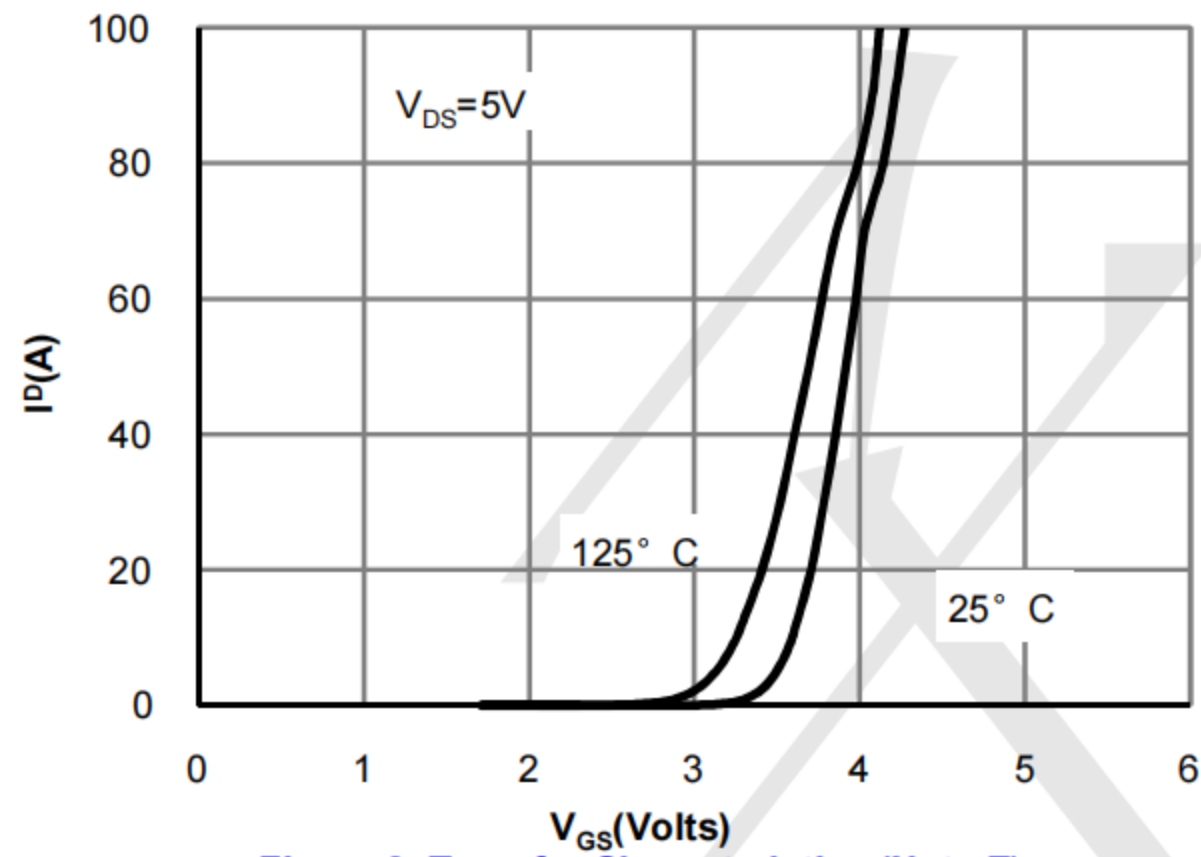


Figure 2: Transfer Characteristics (Note E)

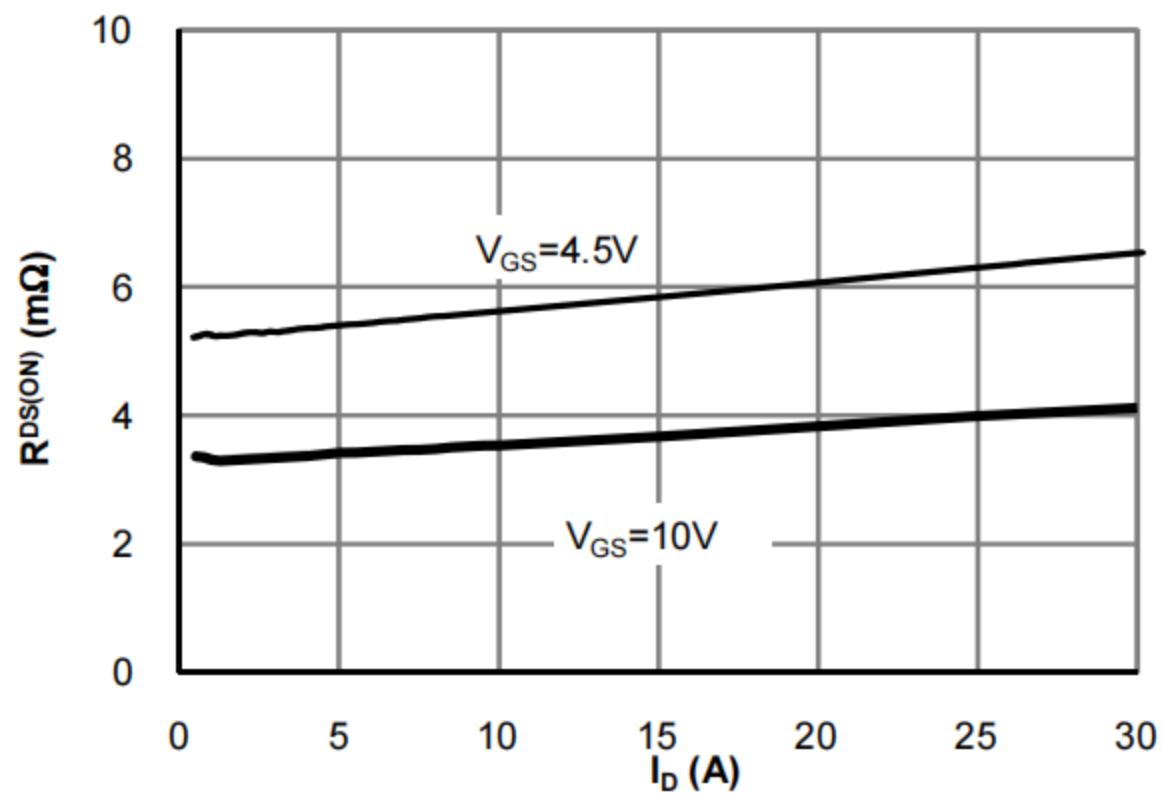


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

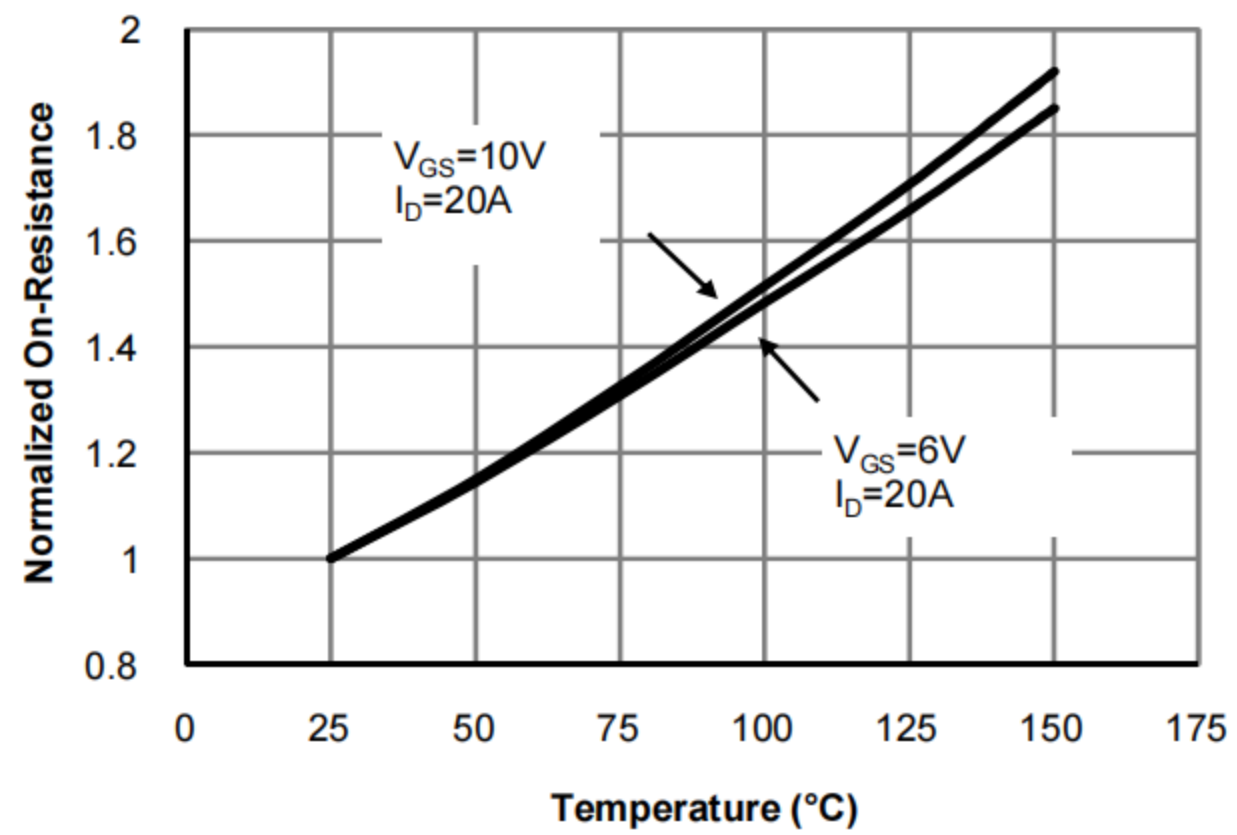


Figure 4: On-Resistance vs. Junction Temperature (Note E)

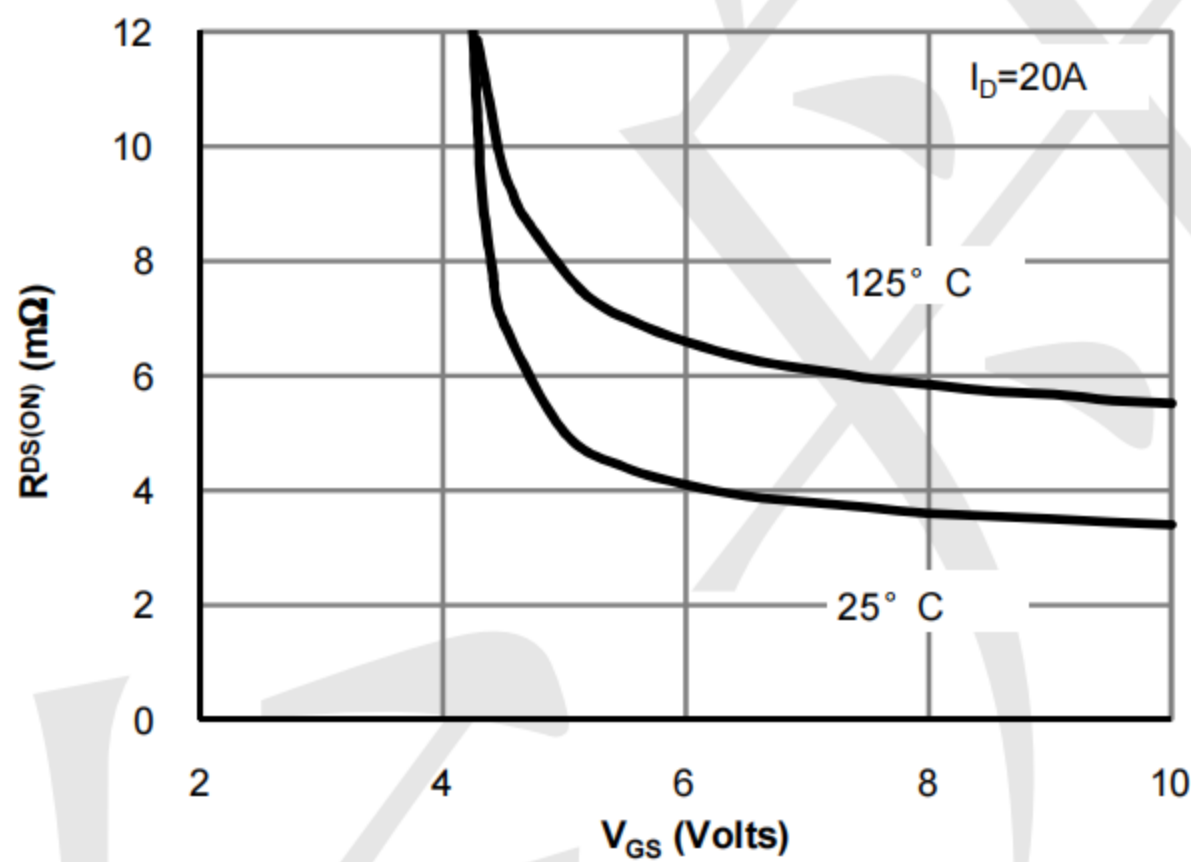


Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

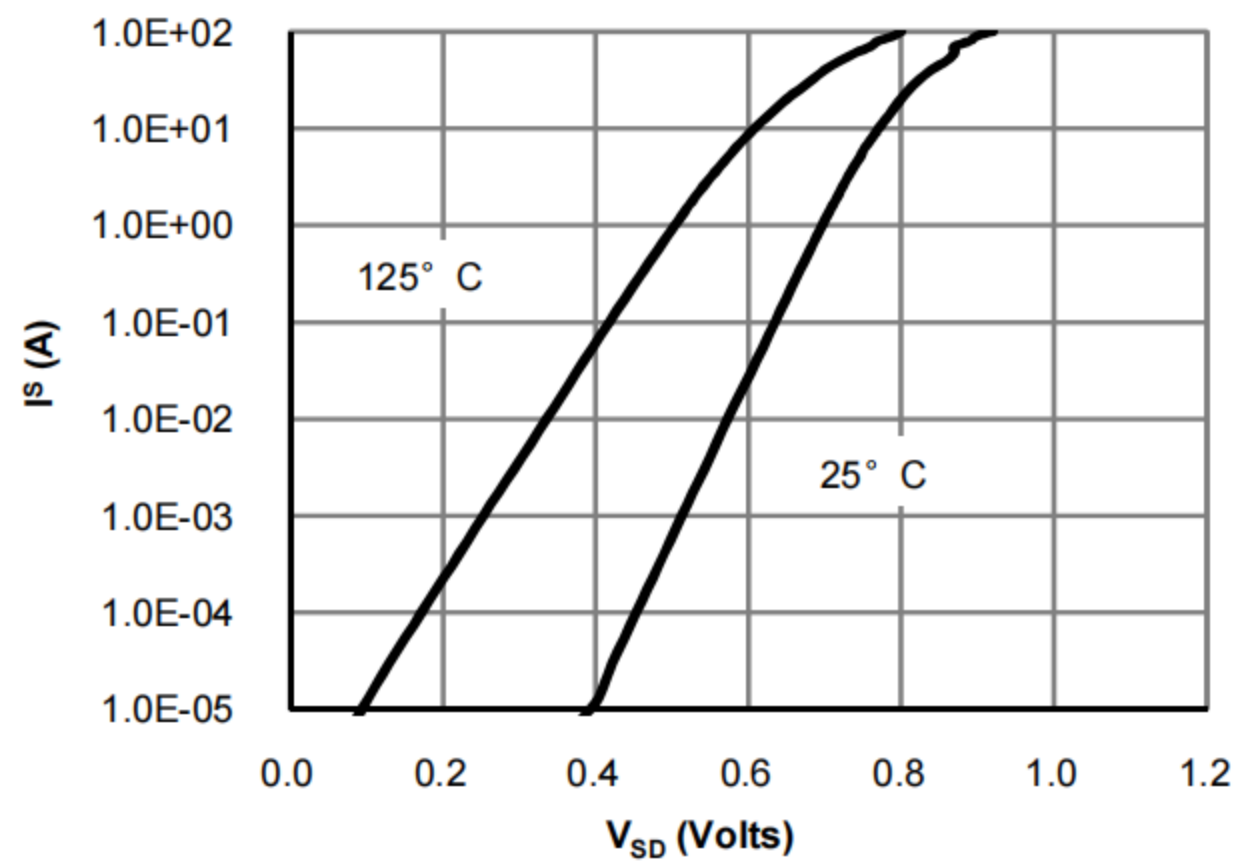


Figure 6: Body-Diode Characteristics (Note E)

(Note E)

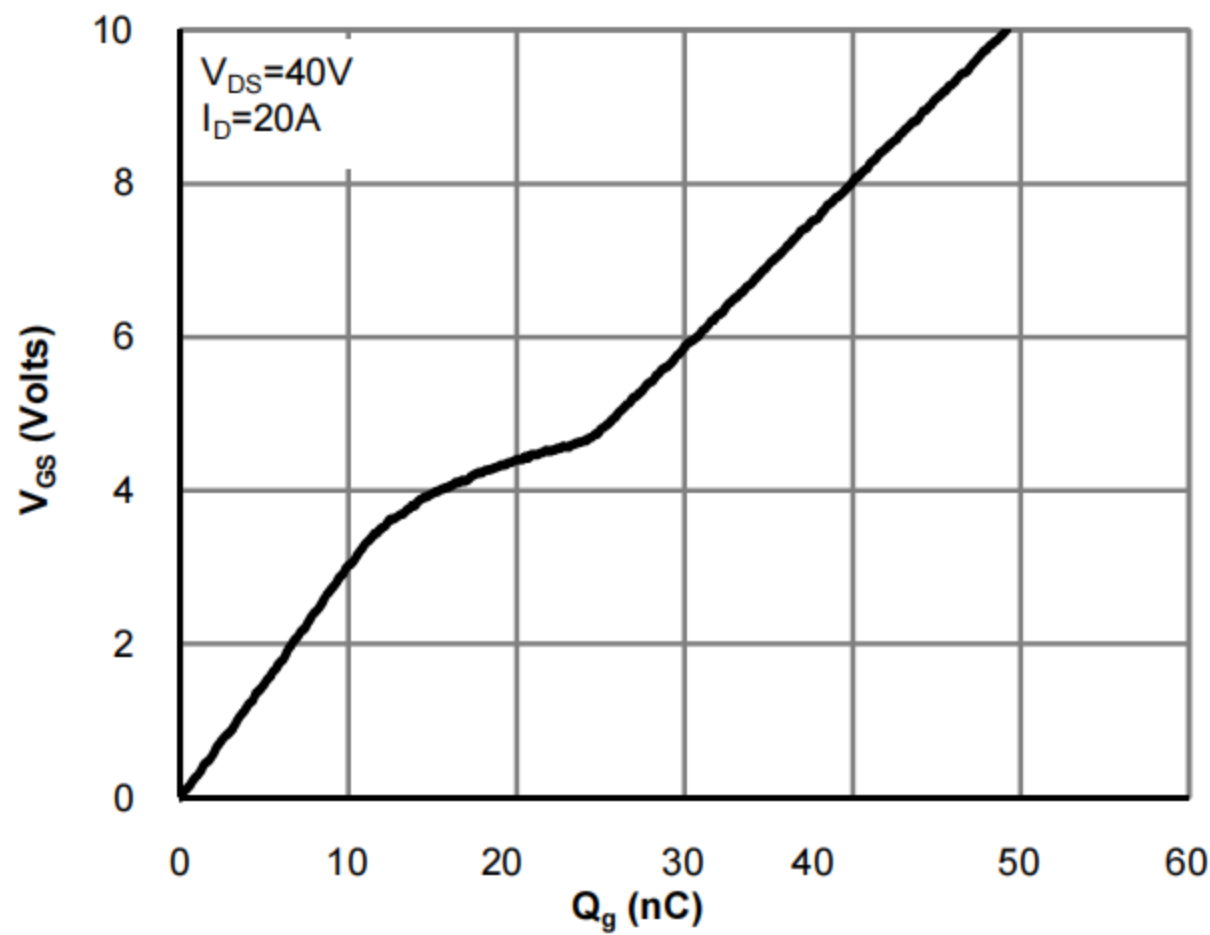


Figure 7: Gate-Charge Characteristics

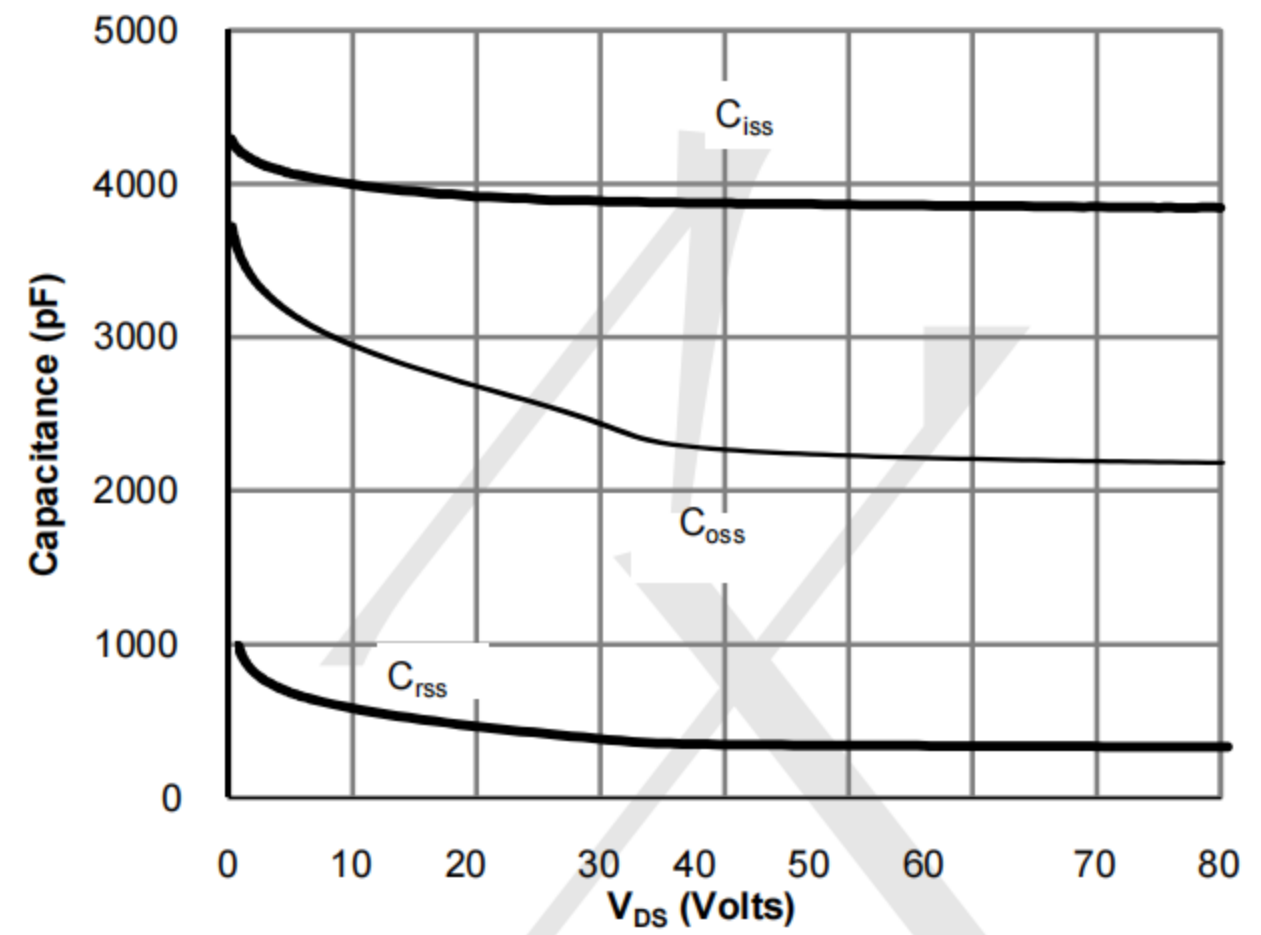


Figure 8: Capacitance Characteristics

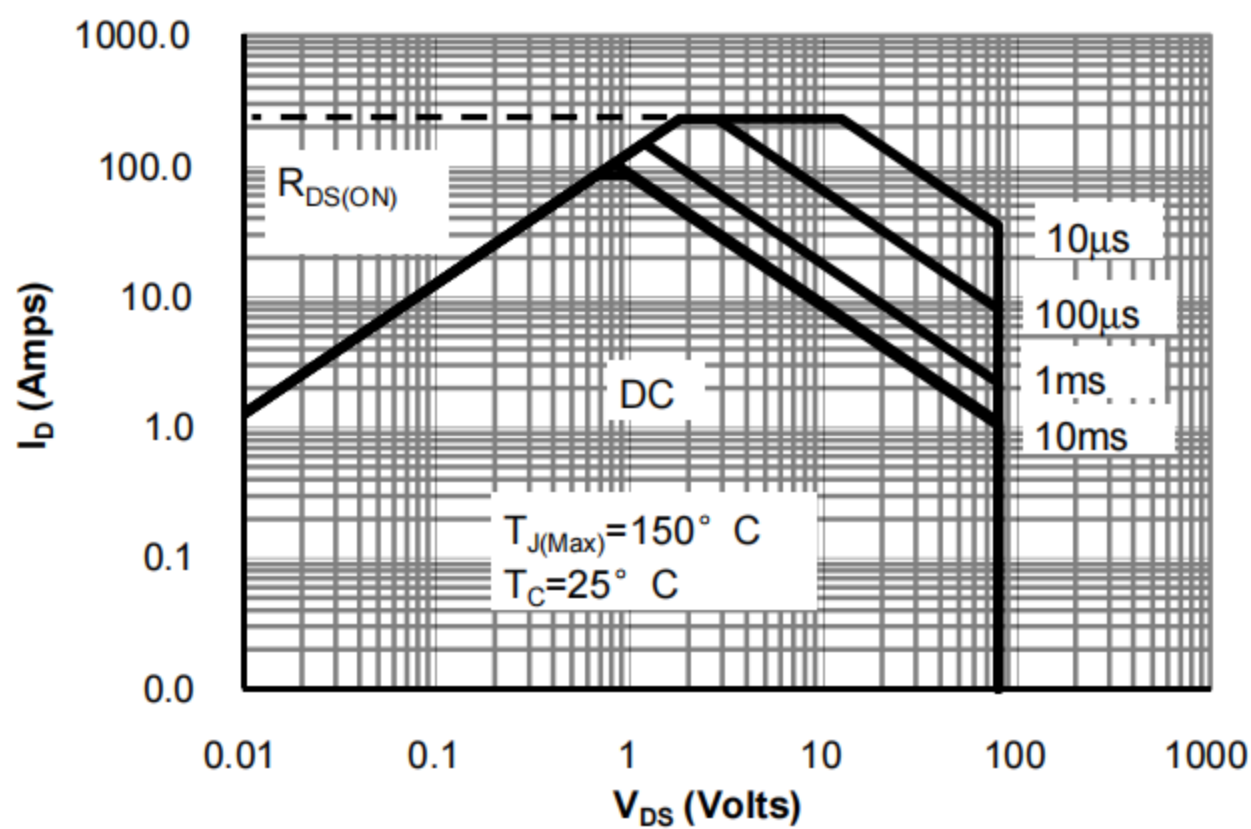


Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

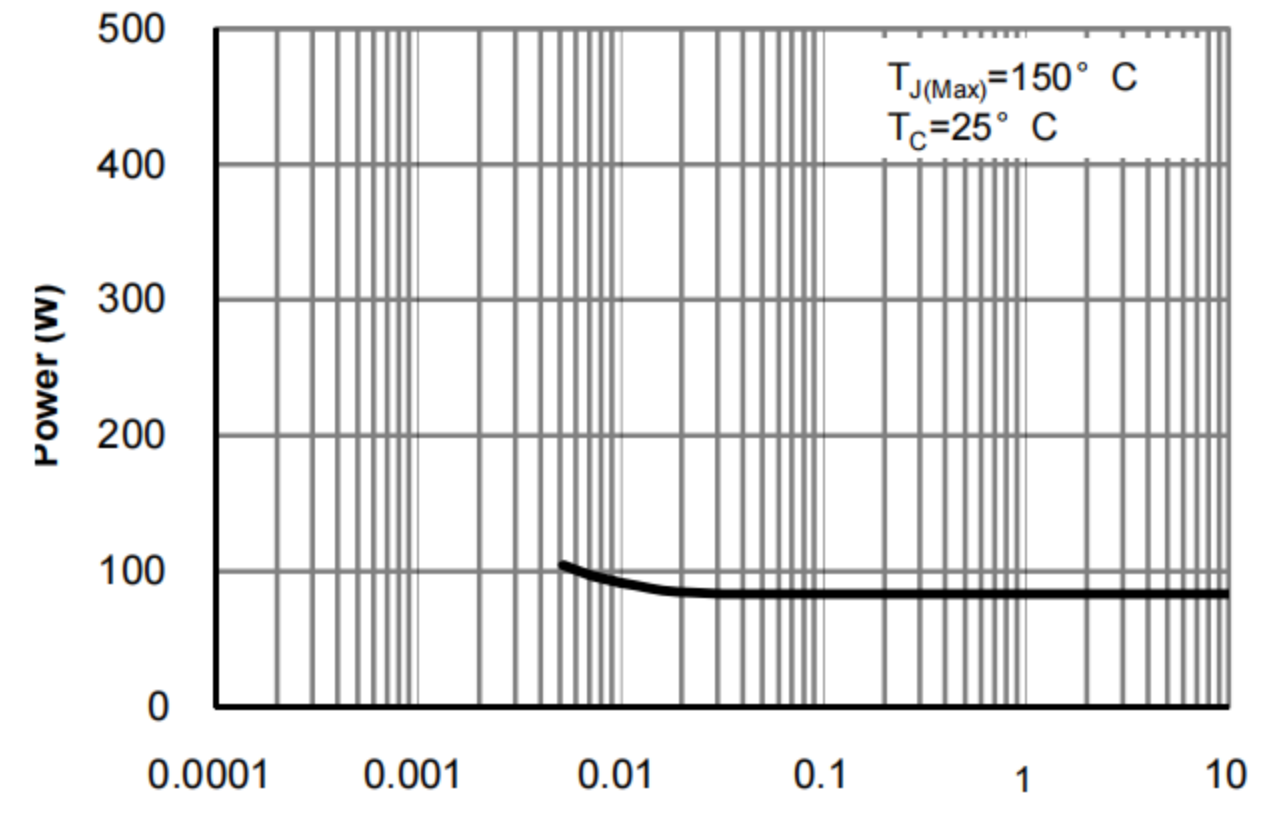


Figure 10: Single Pulse Power Rating Junction-to-Case (Note F)

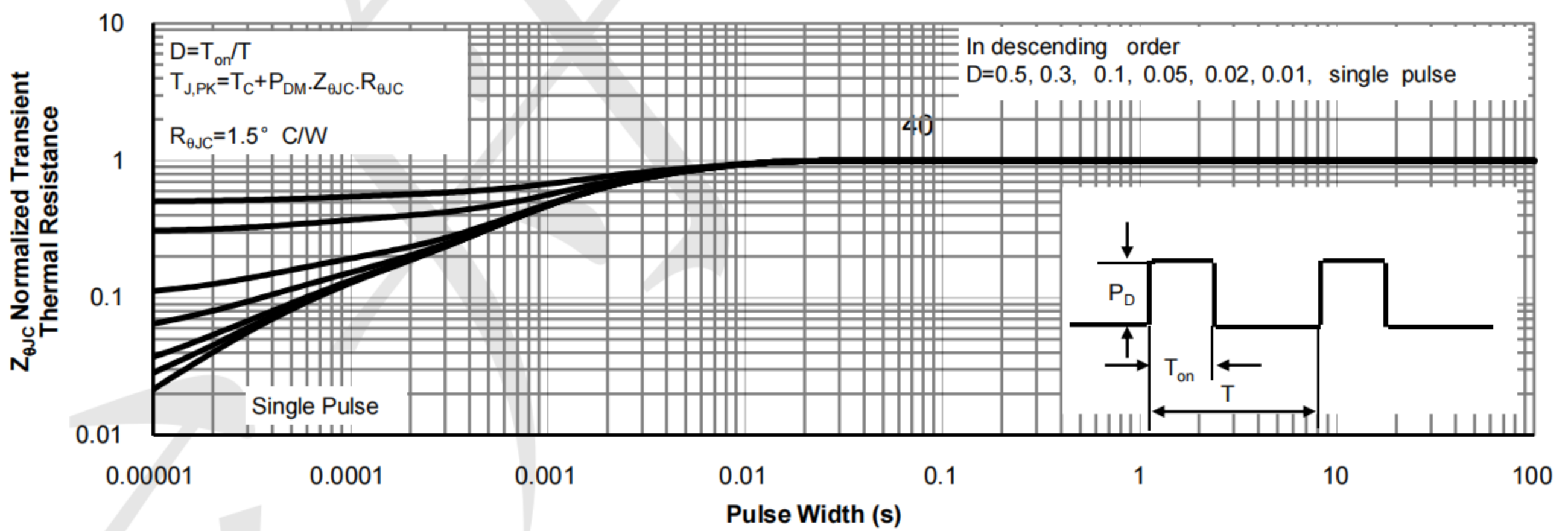


Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)



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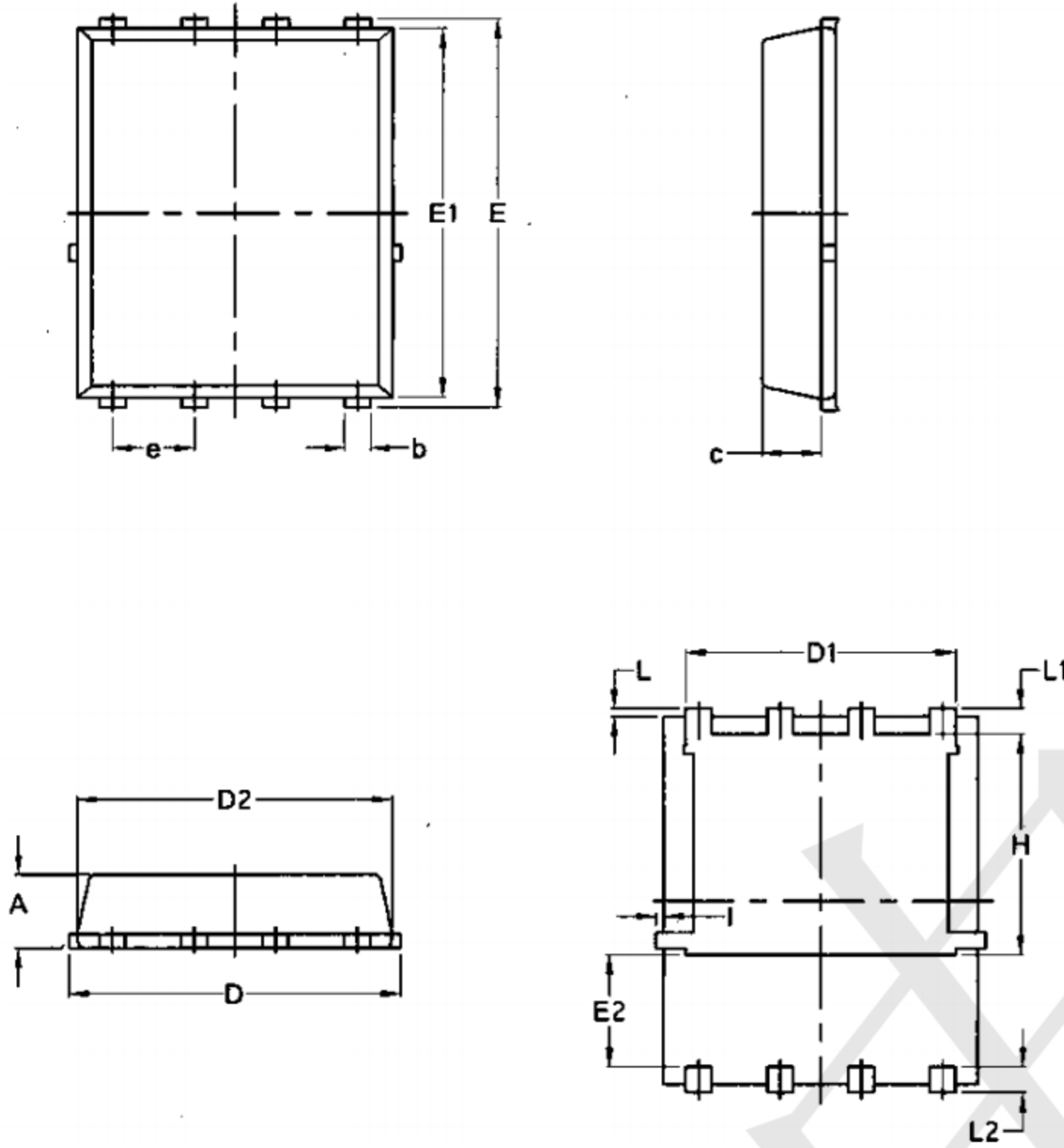
—台丹电子—

**TPM60130ND56**

60V N-Channel MOSFET

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**Package Outline Dimensions PDFN5\*6-8L**



Symbol	Common			
	mm		Inch	
	Min	Max	Min	Max
A	1.03	1.17	0.0406	0.0461
b	0.34	0.48	0.0134	0.0189
c	0.824	0.0970	0.0324	0.082
D	4.80	5.40	0.1890	0.2126
D1	4.11	4.31	0.1618	0.1697
D2	4.80	5.00	0.1890	0.1969
E	5.95	6.15	0.2343	0.2421
E1	5.65	5.85	0.2224	0.2303
E2	1.60	/	0.0630	/
e	1.27 BSC		0.05 BSC	
L	0.05	0.25	0.0020	0.0098
L1	0.38	0.50	0.0150	0.0197
L2	0.38	0.50	0.0150	0.0197
H	3.30	3.50	0.1299	0.1378
I	/	0.18	/	0.0070

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