TECH PUBLIC
台舟电子

## Product Summary

- V_{DS} = 40V
- I_D = 60A (V_{GS} = 10V)
- $R_{DS(ON)}$=5.5 mΩ @V_{GS} =10V
- $R_{DS(ON)}$ =6.0mΩ @V_{GS} =4.5V

Application

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

Package and Pin Configuration
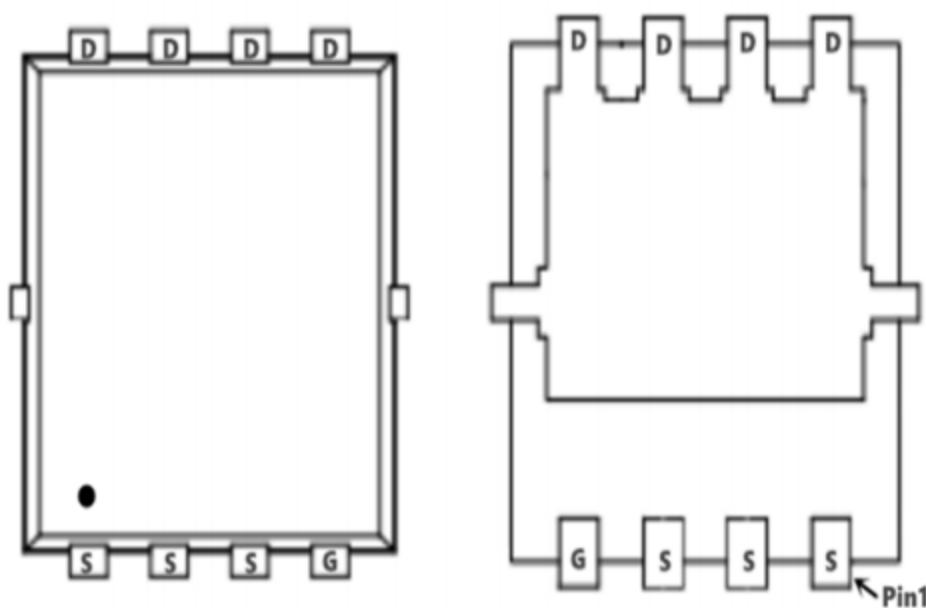
PDFN5*6-8L

Circuit diagram
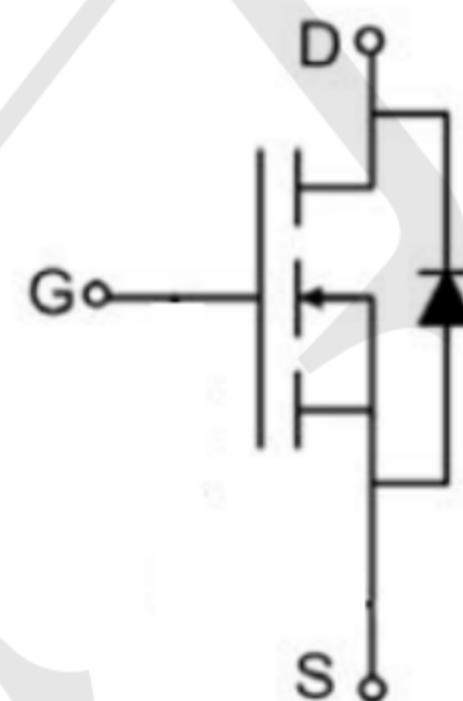
Marking:M4060N

Absolute Maximum Ratings (T_A=25°C unless otherwise specified)

| Symbol	Parameter		Steady State	Units
V_{DS}	Drain-Source Voltage		40	V
V_{GS}	Gate-Source Voltage		±20	V
I_D	Continuous Drain Current [1]	T_C = 25°C	60	A
I_{DM}	Pulsed Drain Current [2]		300	A
I_S	Continuous Source Current (Diode Conduction) [1]		60	A
E_{AS}	Single Pulse Drain-Source Avalanche Energy [3]		110	mJ
P_D	Maximum Power Dissipation	T_A = 25°C	2	W
		T_C = 25°C	89	
T_J, T_{STG}	Operating Junction and Storage Temperature Range		-55~150	°C

Thermal Characteristics

Symbol	Parameter	Typical	Maximum	Unit
R_{thJA}	Maximum Junction-to-Ambient	-	62.5	°C/W
R_{thJC}	Maximum Junction-to-Case	-	1.4	

Electrical Characteristics (T =25°C unless otherwise specified)

Symbol	Parameter	Test Condition	Min	Typ	Max	Unit
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}= 0V$, $I_D= 250\mu A$	40	-	-	V
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS} = V_{DS}$, $I_D = 250\mu A$	1	1.8	2.2	V
I_{GSS}	Gate-Body Leakage Current	$V_{GS} = \pm20V$, $V_{DS} = 0V$	-	-	±100	nA
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 32V$, $V_{GS} = 0V$	-		1	μA
		$V_{DS} = 32V$, $V_{GS} = 0V$, $T_J = 85℃$	-		30	
$R_{DS(on)}$	Drain Source On State Resistance [a]	$V_{GS} = 10V$, $I_D = 60A$	-	5.5	6.5	mΩ
		$V_{GS} = 4.5V$, $I_D = 30A$	-	6.0	8.0	
V_{SD}	Diode Forward Voltage [a]	$V_{GS} = 0V$, $I_S = 40A$	-	0.82	1.3	V
Dynamic Characteristics [b]						
C_{iss}	Input Capacitance	$V_{DS}= 15V$, $V_{GS}= 0V$, $f = 1MHz$	-	5120	-	pF
C_{oss}	Output Capacitance		-	1210	-	
C_{rss}	Reverse Transfer Capacitance		-	390	-	
Q_g	Total Gate Charge	$V_{DS} = 15V$, $V_{GS} = 10V$, $I_D = 20A$	-	41	-	nC
Q_{gs}	Gate-Source Charge		-	15	-	
Q_{gd}	Gate-Drain Charge		-	12	-	
$t_{d(on)}$	Turn-On Delay Time	$V_{DD} = 15V$, $V_{GS} = 4.5V$ $I_D = 20A$, $R_{GEN} = 3\Omega$	-	22	-	nSec
t_r	Rise Time		-	35	-	
$t_{d(off)}$	Turn-Off Delay Time		-	50	-	
t_f	Fall Time		-	27	-	
t_{rr}	Body Diode Reverse Recovery Time	$I_F =20A$, $di/dt= 100A/\mu A$, $T_J=25℃$	-	33	-	nSec

Typical Electrical and Thermal Characteristic Curves

Output Characteristics

Transfer Characteristics

On-Resistance vs. Drain Current

Capacitance

Gate Charge

On-Resistance vs. Junction Temperature
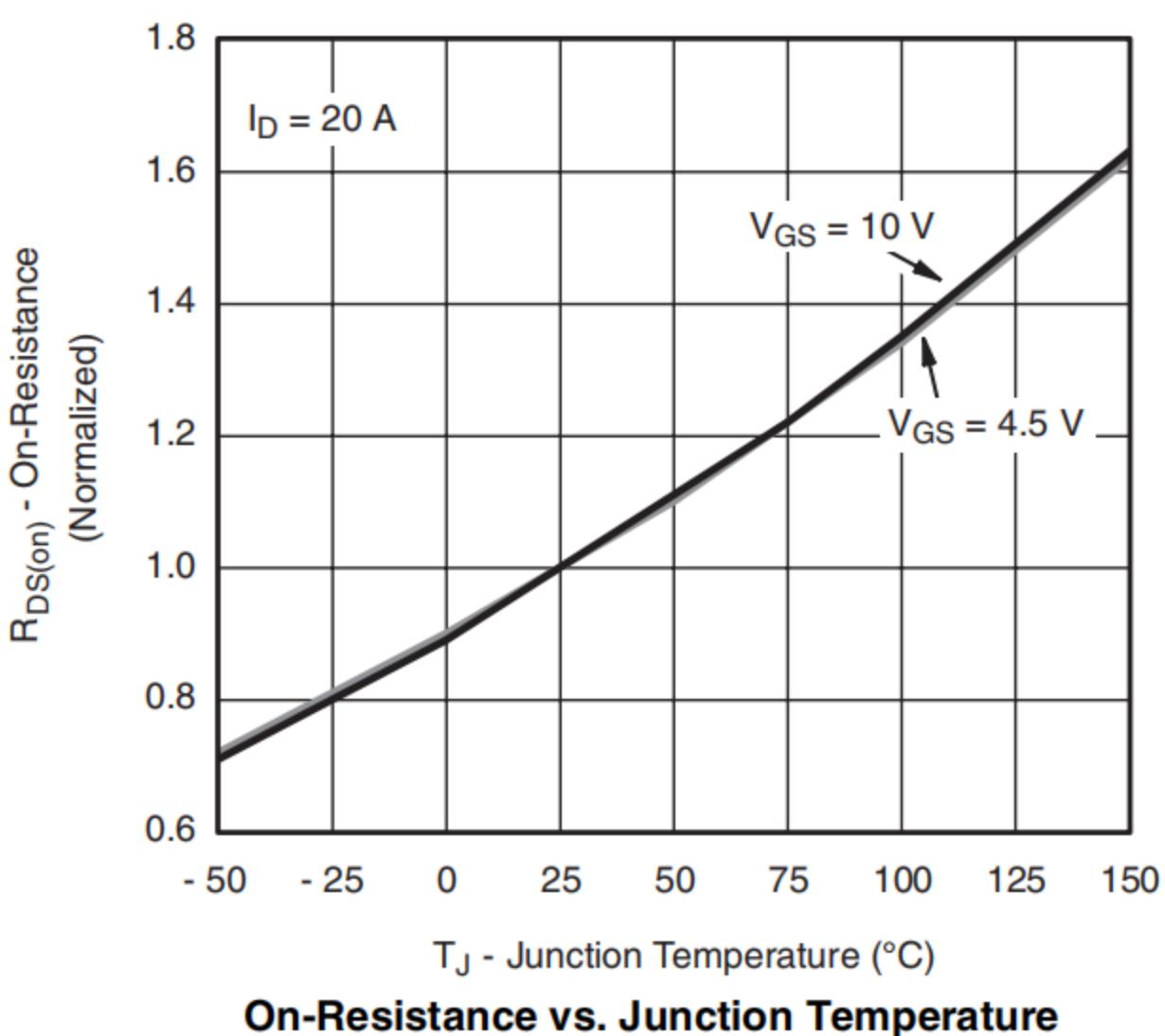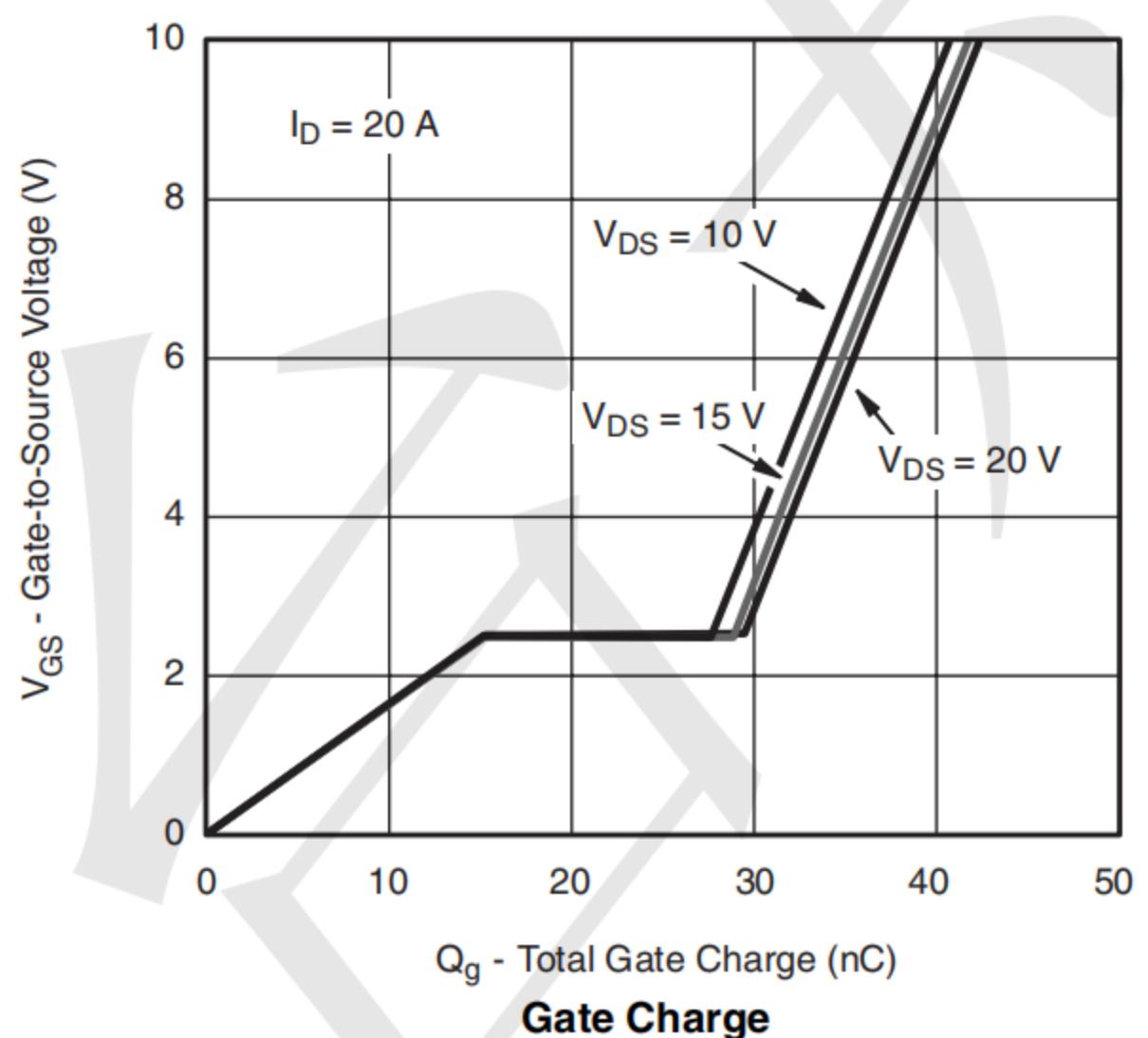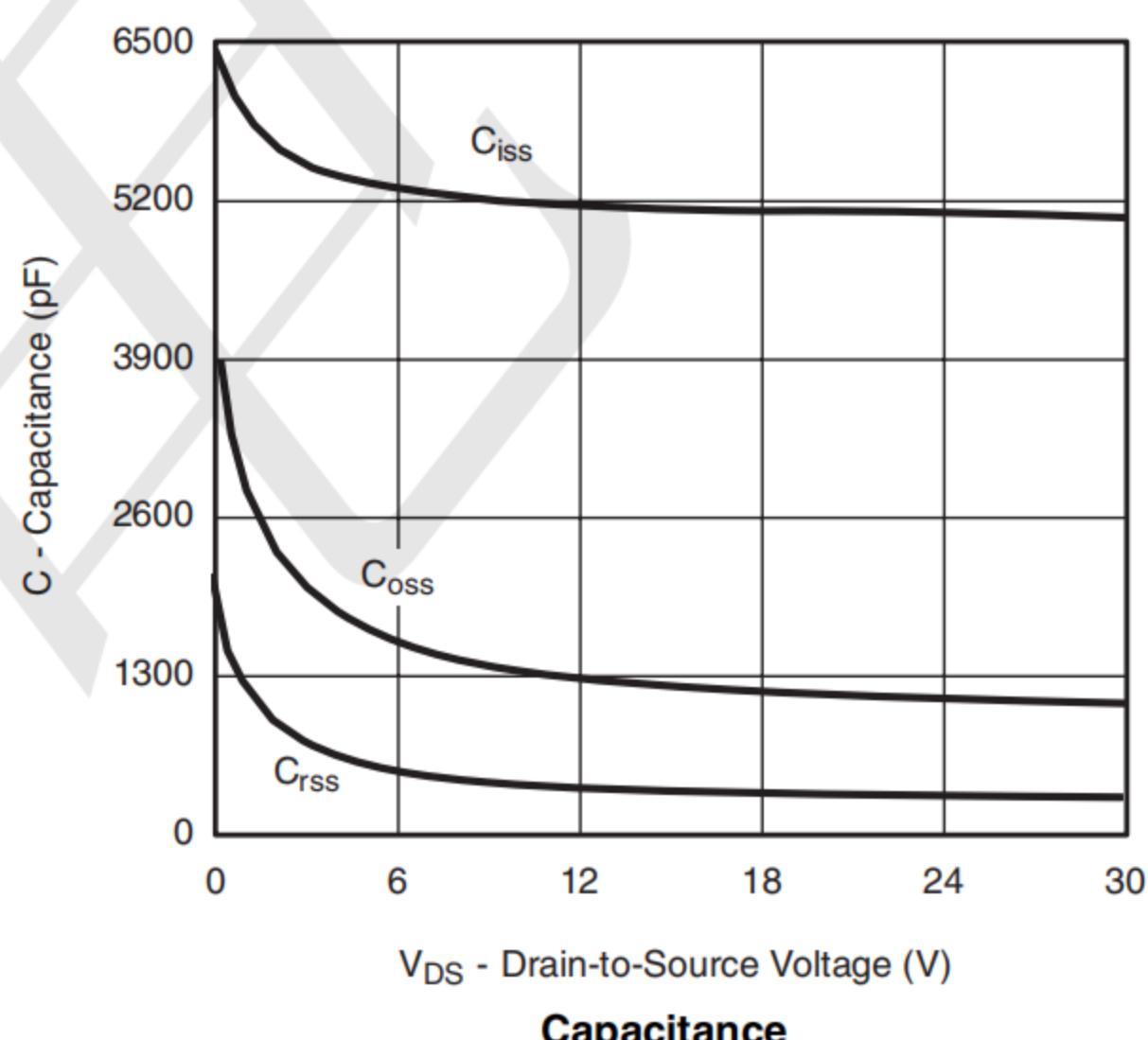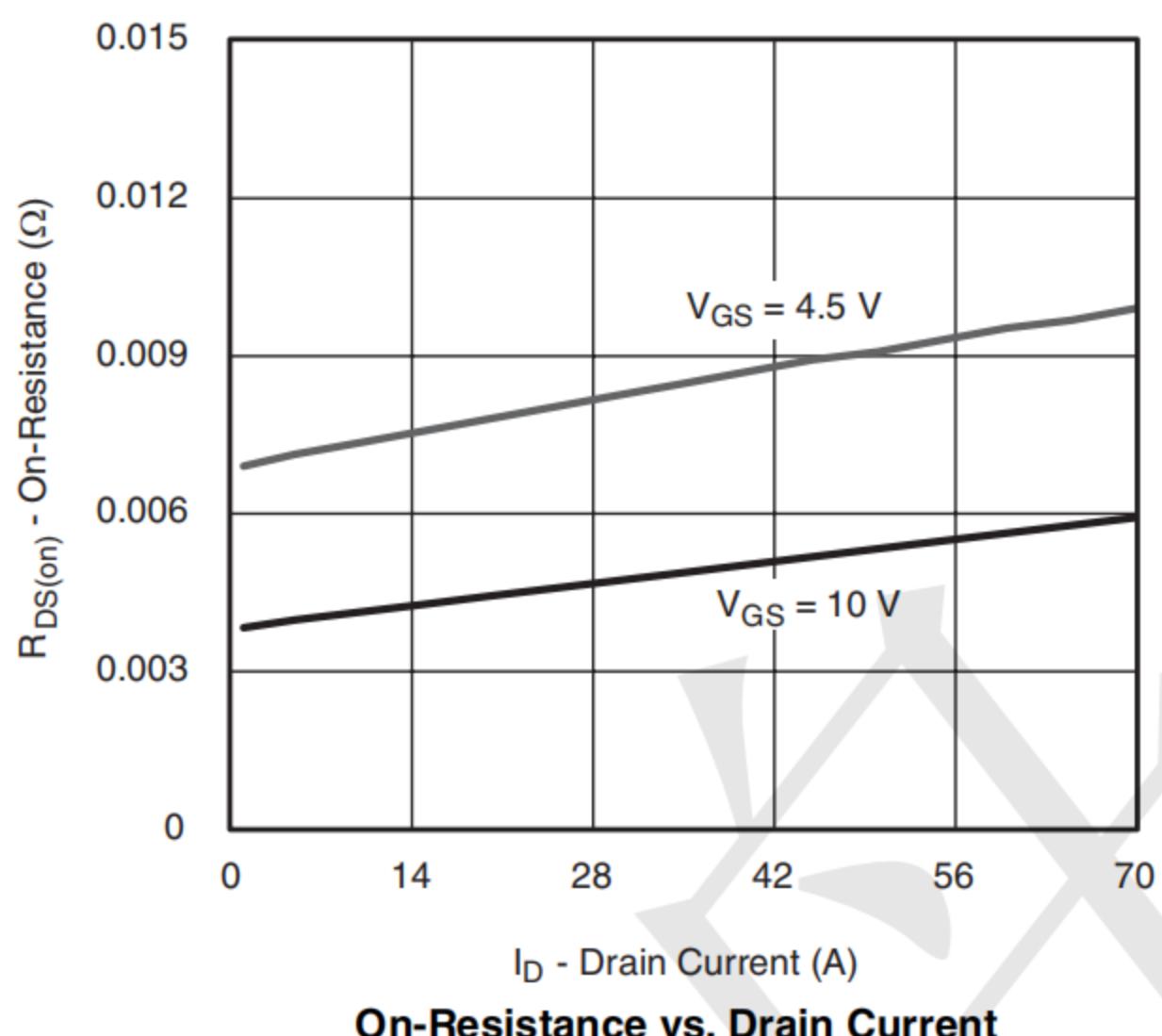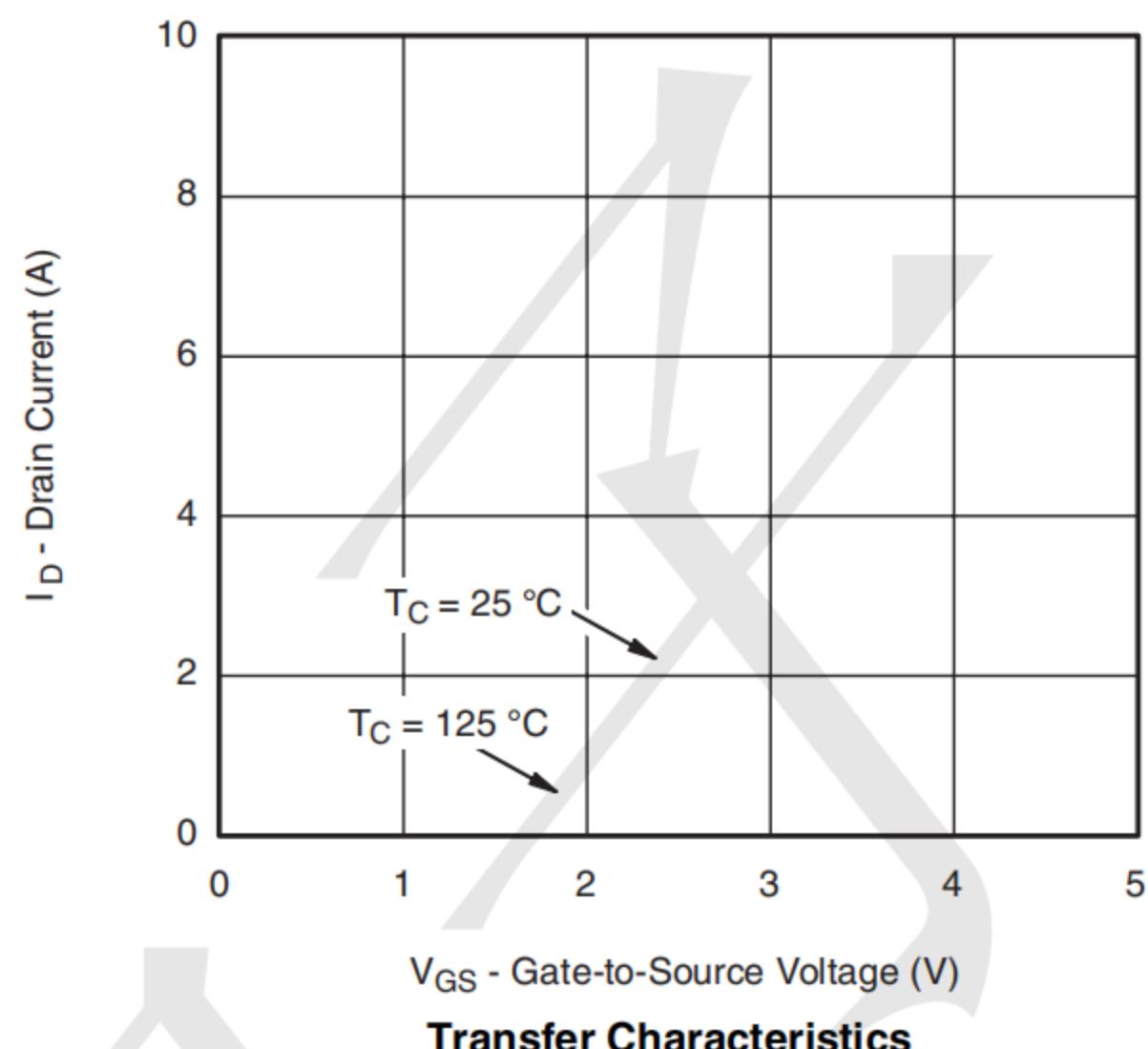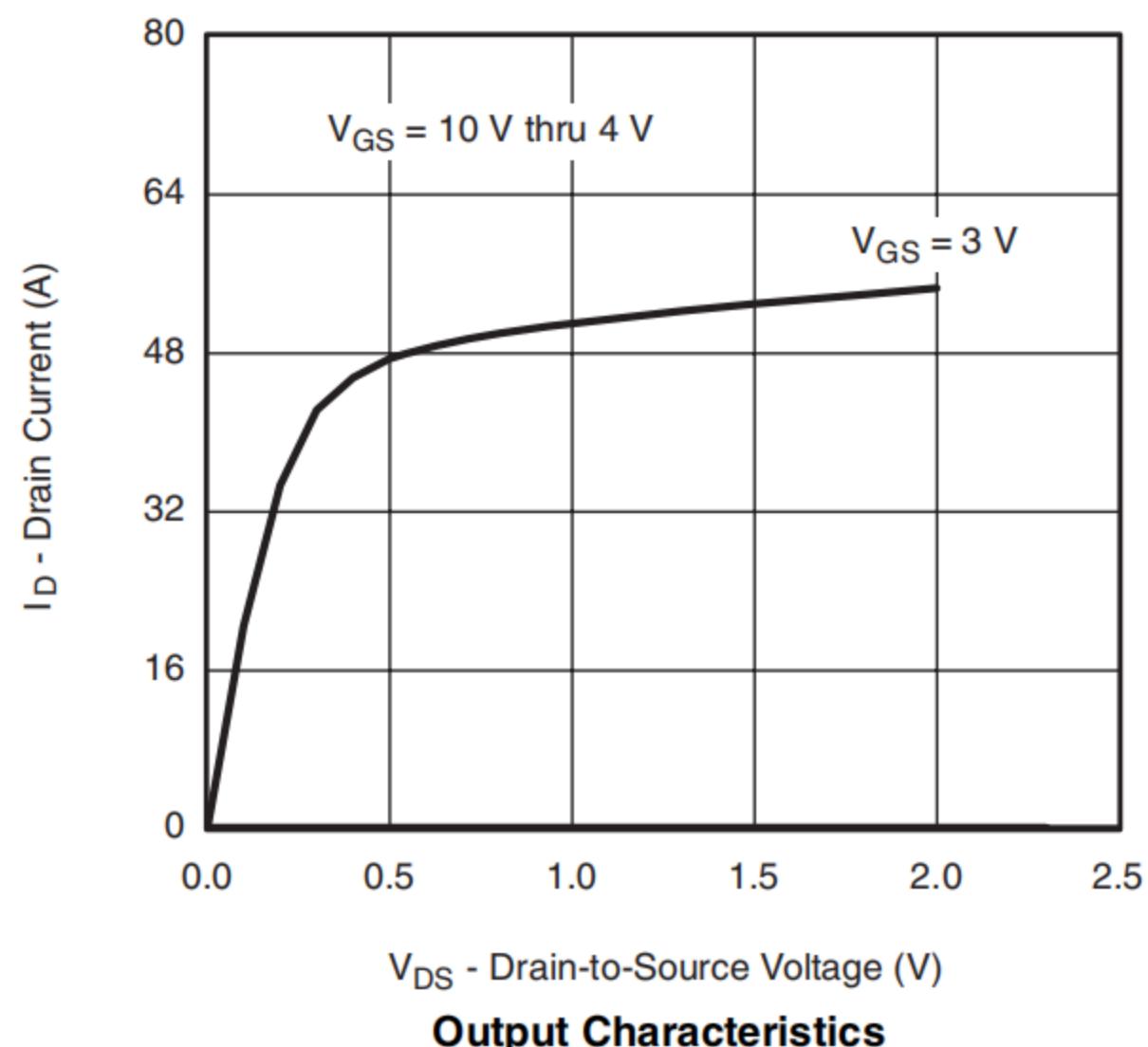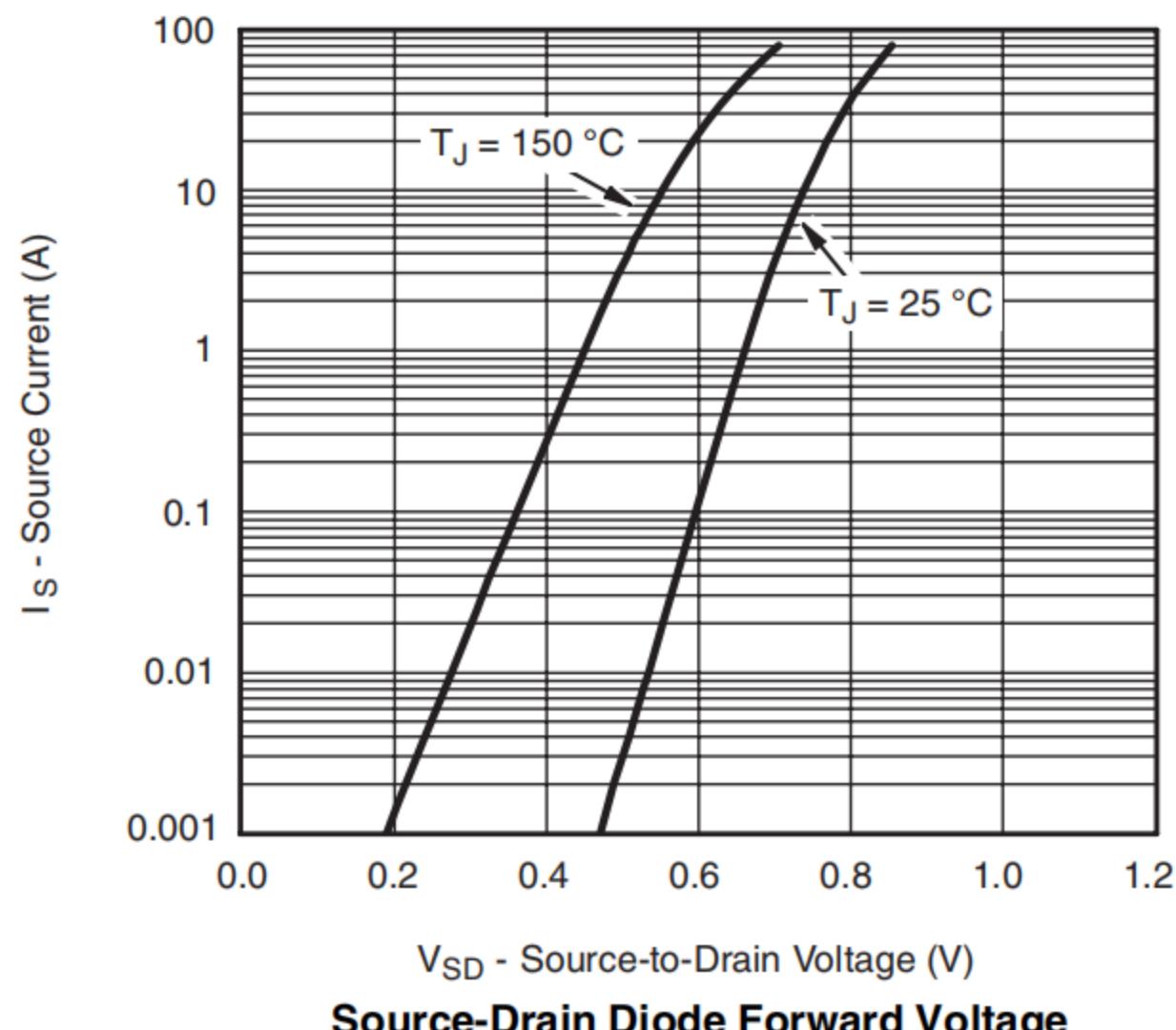
Source-Drain Diode Forward Voltage
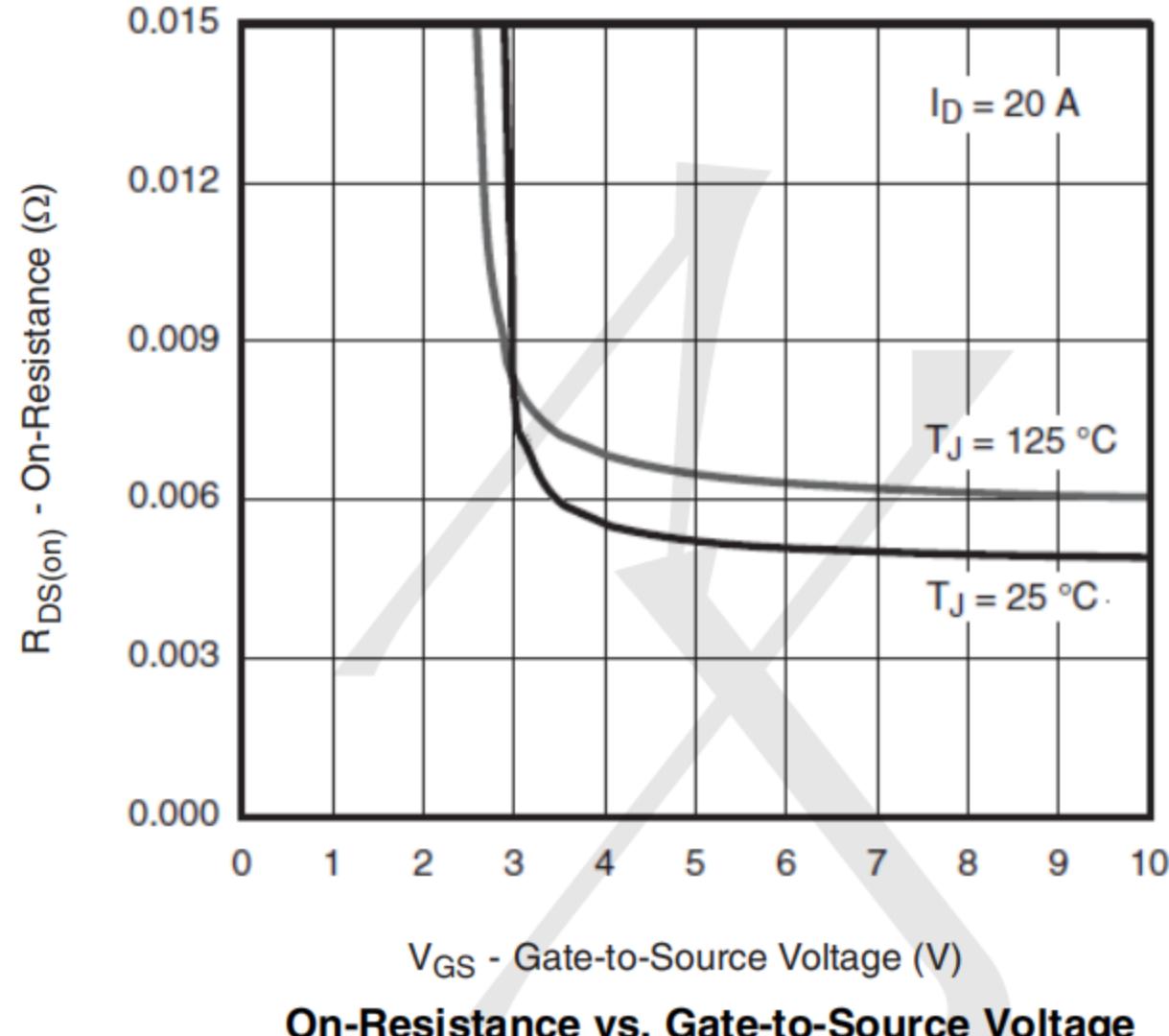
On-Resistance vs. Gate-to-Source Voltage
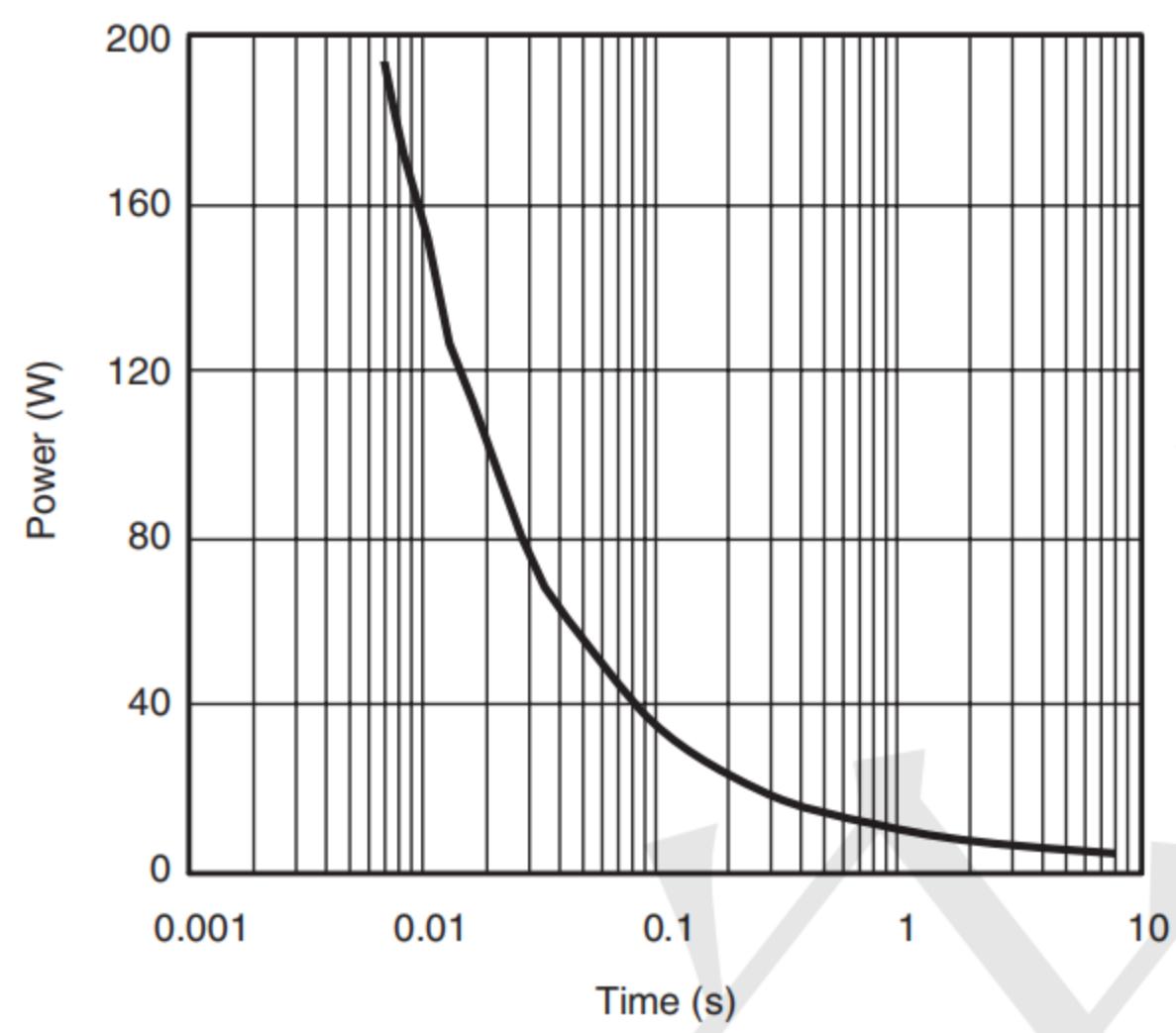
Single Pulse Power, Junction-to-Ambient
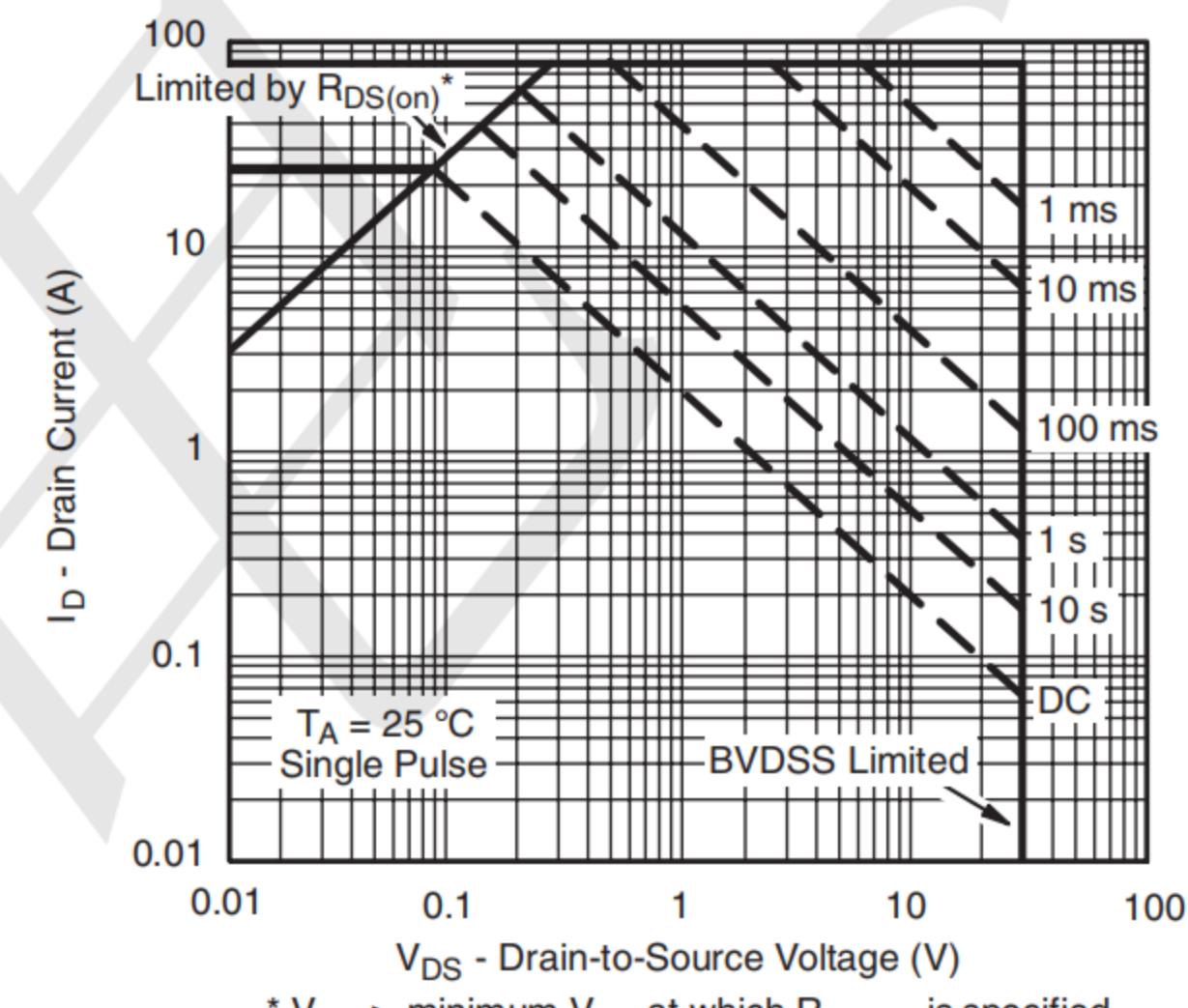
* V_{GS} > minimum V_{GS} at which $R_{DS(on)}$ is specified

Safe Operating Area, Junction-to-Ambient
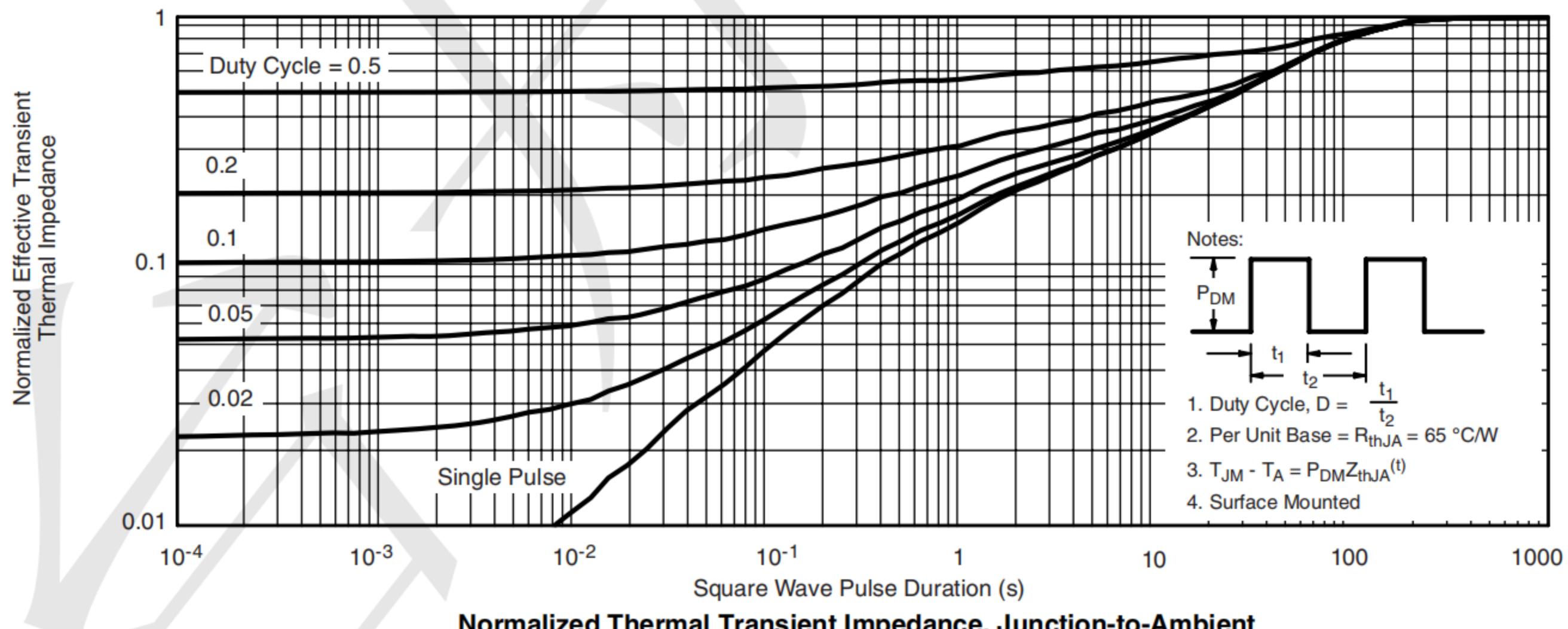
Notes:

1. Duty Cycle, $D = \dfrac{t_1}{t_2}$
2. Per Unit Base = R_{thJA} = 65 °C/W
3. $T_{JM} - T_A = P_{DM}Z_{thJA}(t)$
4. Surface Mounted

Normalized Thermal Transient Impedance, Junction-to-Ambient

Package Outline Dimensions PDFN5*6-8L
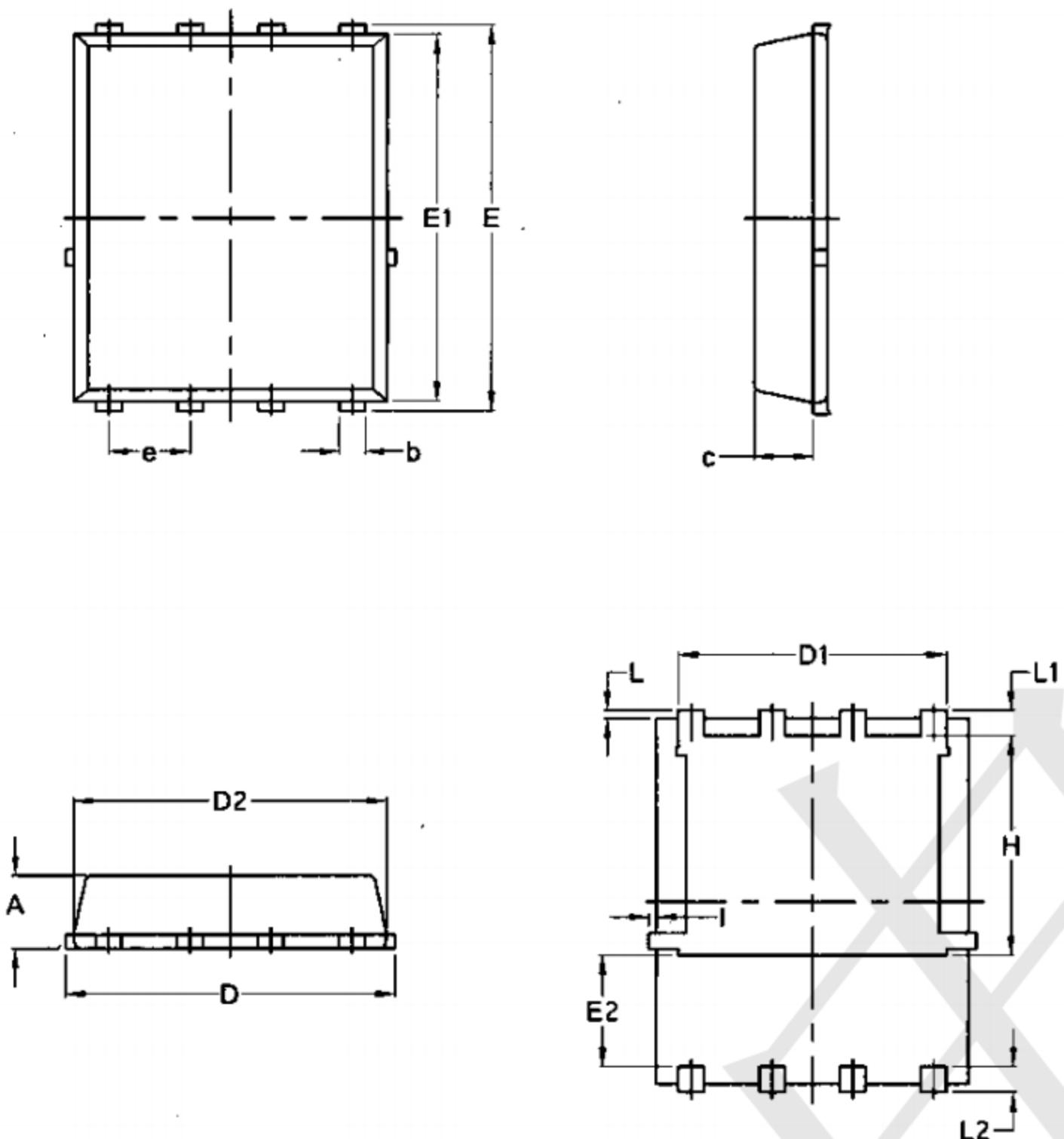
Symbol	Common			
	mm		Inch	
	Mim	Max	Min	Max
A	1.03	1.17	0.0406	0.0461
b	0.34	0.48	0.0134	0.0189
c	0.824	0.0970	0.0324	0.082
D	4.80	5.40	0.1890	0.2126
D1	4.11	4.31	0.1618	0.1697
D2	4.80	5.00	0.1890	0.1969
E	5.95	6.15	0.2343	0.2421
E1	5.65	5.85	0.2224	0.2303
E2	1.60	/	0.0630	/
e	1.27 BSC		0.05 BSC	
L	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