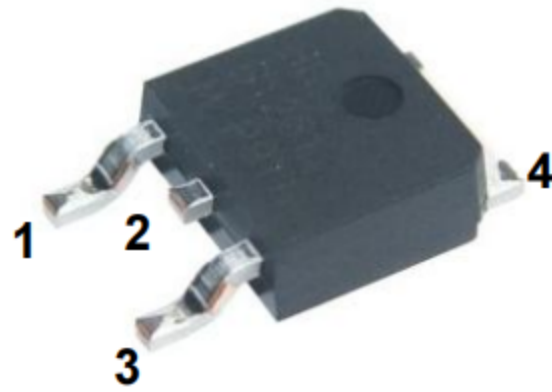




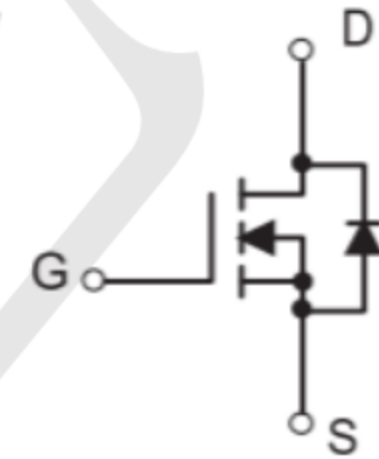
Product Summary

V_{DS}	100V
I_D (at $V_{GS}=10V$)	31A
$R_{DS(ON)}$ (at $V_{GS}=10V$)	< 24m Ω
$R_{DS(ON)}$ (at $V_{GS}=4.5V$)	< 33m Ω

TO-252



Circuit Diagram



N-MOS

Marking: :40N10

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

Parameter	Symbol	Maximum	Units
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	I_D	$T_C=25^\circ C$	31
		$T_C=100^\circ C$	21.5
Pulsed Drain Current ^C	I_{DM}	80	A
Continuous Drain Current	I_{DSM}	$T_A=25^\circ C$	6.5
		$T_A=70^\circ C$	5
Avalanche Current ^C	I_{AS}	15	A
Avalanche energy L=0.1mH ^C	E_{AS}	11	mJ
Power Dissipation ^B	P_D	$T_C=25^\circ C$	53.5
		$T_C=100^\circ C$	26.5
Power Dissipation ^A	P_{DSM}	$T_A=25^\circ C$	2.5
		$T_A=70^\circ C$	1.6
Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 175	°C

Thermal Characteristics

Parameter	Symbol	Typ	Max	Units
Maximum Junction-to-Ambient ^A	$R_{\theta JA}$	16	20	°C/W
Maximum Junction-to-Ambient ^{A D}		Steady-State	41	50
Maximum Junction-to-Case	$R_{\theta JC}$	2.2	2.8	°C/W



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

Symbol	Parameter	Conditions	Min	Typ	Max	Units	
STATIC PARAMETERS							
BV _{DSS}	Drain-Source Breakdown Voltage	I _D =250μA, V _{GS} =0V	100			V	
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =100V, V _{GS} =0V T _J =55°C			1 5	μA	
I _{GSS}	Gate-Body leakage current	V _{DS} =0V, V _{GS} =±20V			±100	nA	
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	1.6	2.15	2.7	V	
I _{D(ON)}	On state drain current	V _{GS} =10V, V _{DS} =5V	80			A	
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =10V, I _D =20A T _J =125°C		18.5 33	24 42	mΩ	
		V _{GS} =4.5V, I _D =18A		24.5	33	mΩ	
g _{FS}	Forward Transconductance	V _{DS} =5V, I _D =20A		40		S	
V _{SD}	Diode Forward Voltage	I _S =1A, V _{GS} =0V		0.72	1	V	
I _S	Maximum Body-Diode Continuous Current				31	A	
DYNAMIC PARAMETERS							
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =50V, f=1MHz		1190		pF	
C _{oss}	Output Capacitance				95		pF
C _{rss}	Reverse Transfer Capacitance				7		pF
R _g	Gate resistance	V _{GS} =0V, V _{DS} =0V, f=1MHz	0.5	1.1	1.7	Ω	
SWITCHING PARAMETERS							
Q _g (10V)	Total Gate Charge	V _{GS} =10V, V _{DS} =50V, I _D =20A		16.5	25	nC	
Q _g (4.5V)	Total Gate Charge				7	12	nC
Q _{gs}	Gate Source Charge				4.5		nC
Q _{gd}	Gate Drain Charge				2.5		nC
t _{D(on)}	Turn-On DelayTime	V _{GS} =10V, V _{DS} =50V, R _L =2.5Ω, R _{GEN} =3Ω		7		ns	
t _r	Turn-On Rise Time				8		ns
t _{D(off)}	Turn-Off DelayTime				20		ns
t _f	Turn-Off Fall Time				3		ns
t _{rr}	Body Diode Reverse Recovery Time	I _F =20A, di/dt=500A/μs		30		ns	
Q _{rr}	Body Diode Reverse Recovery Charge	I _F =20A, di/dt=500A/μs		145		nC	



Typical Performance Characteristics ($T_A=25^\circ\text{C}$ unless otherwise Specified)

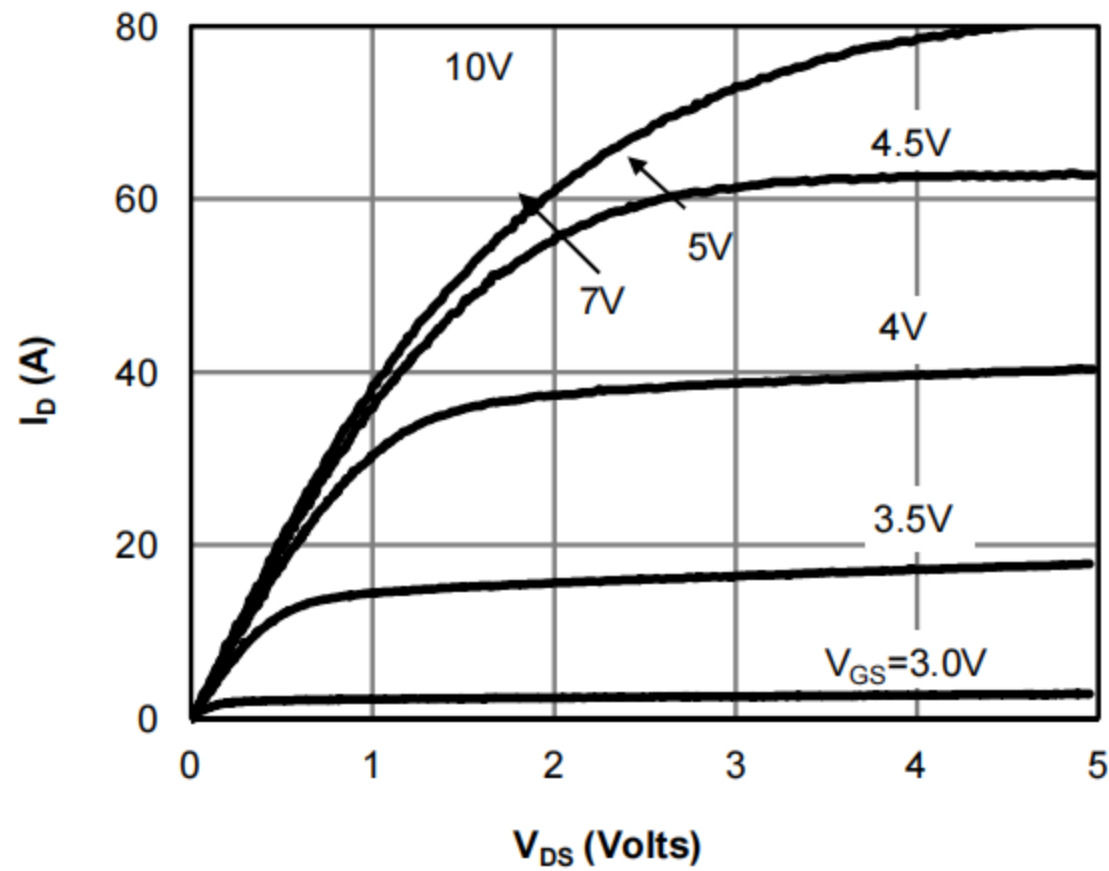


Fig 1: On-Region Characteristics (Note E)

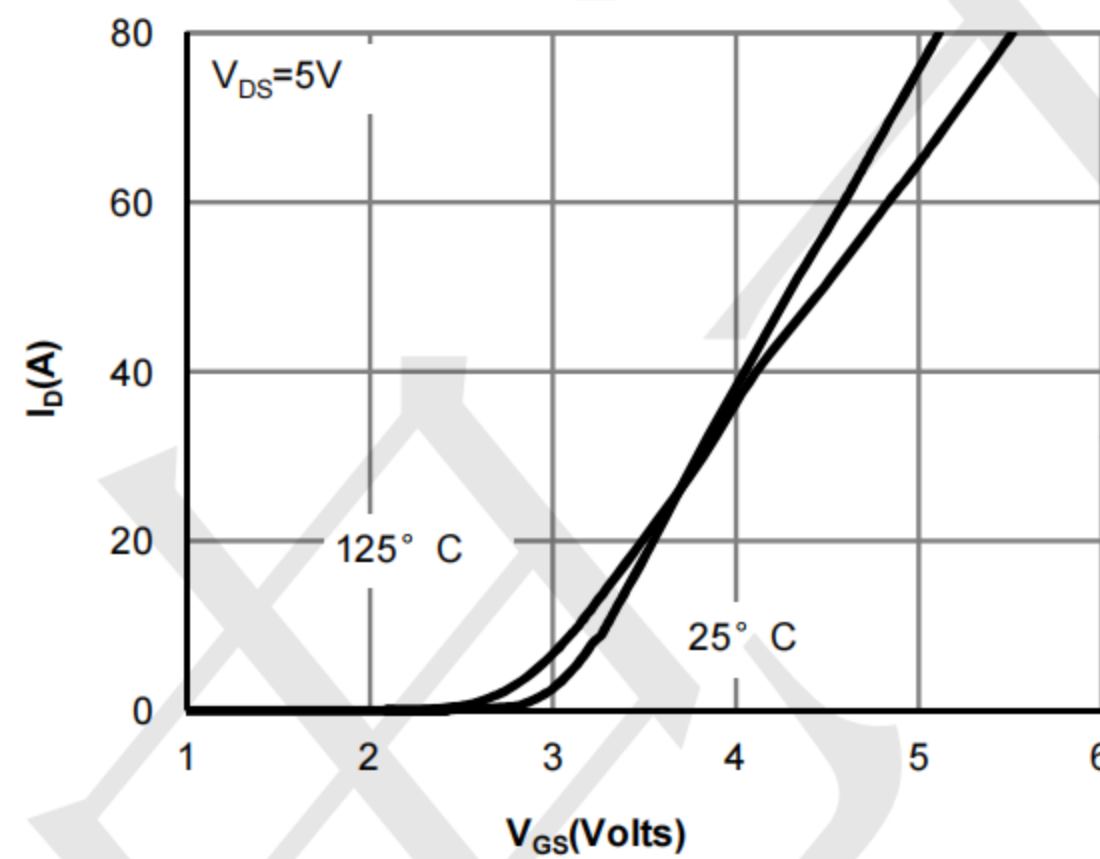


Figure 2: Transfer Characteristics (Note E)

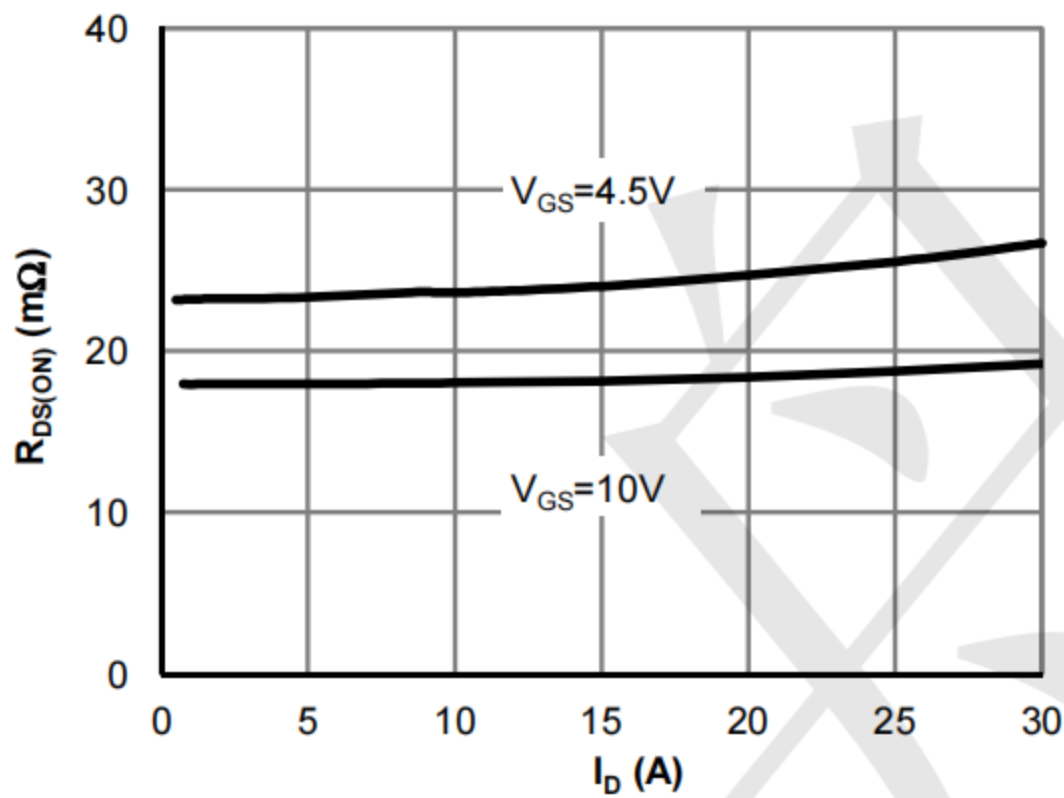


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

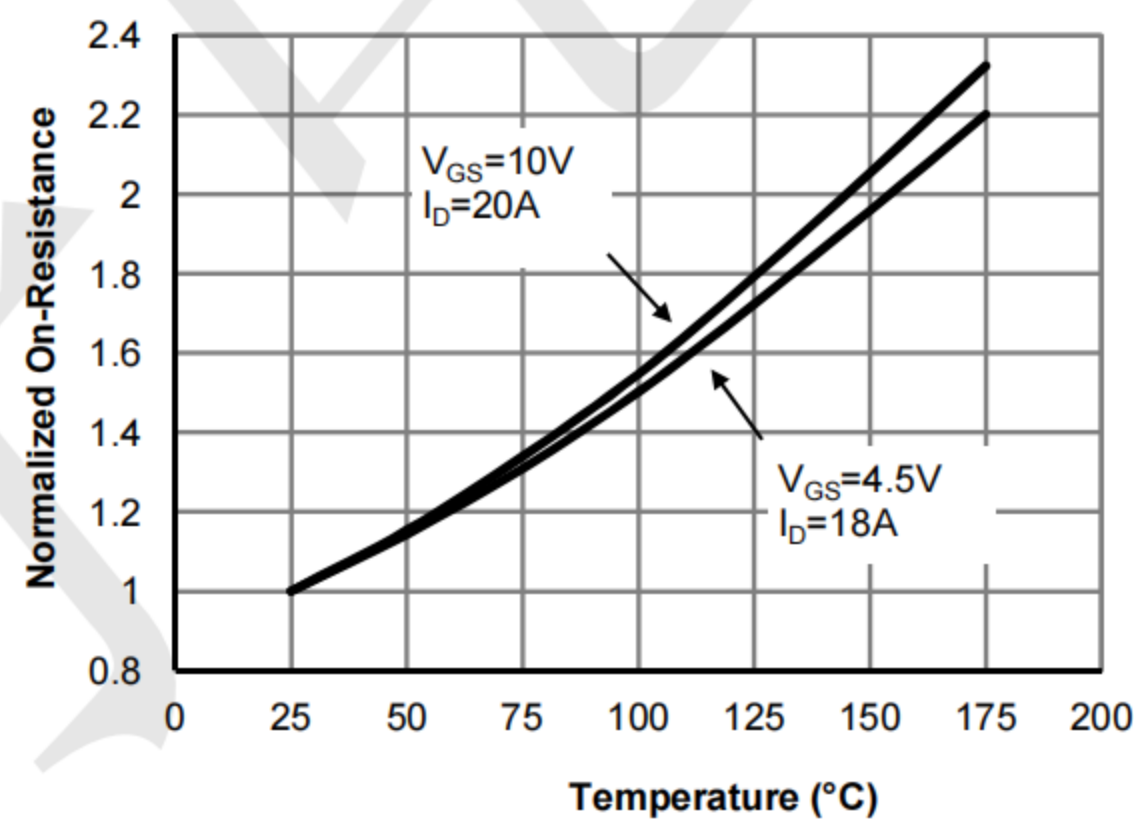


Figure 4: On-Resistance vs. Junction Temperature (Note E)

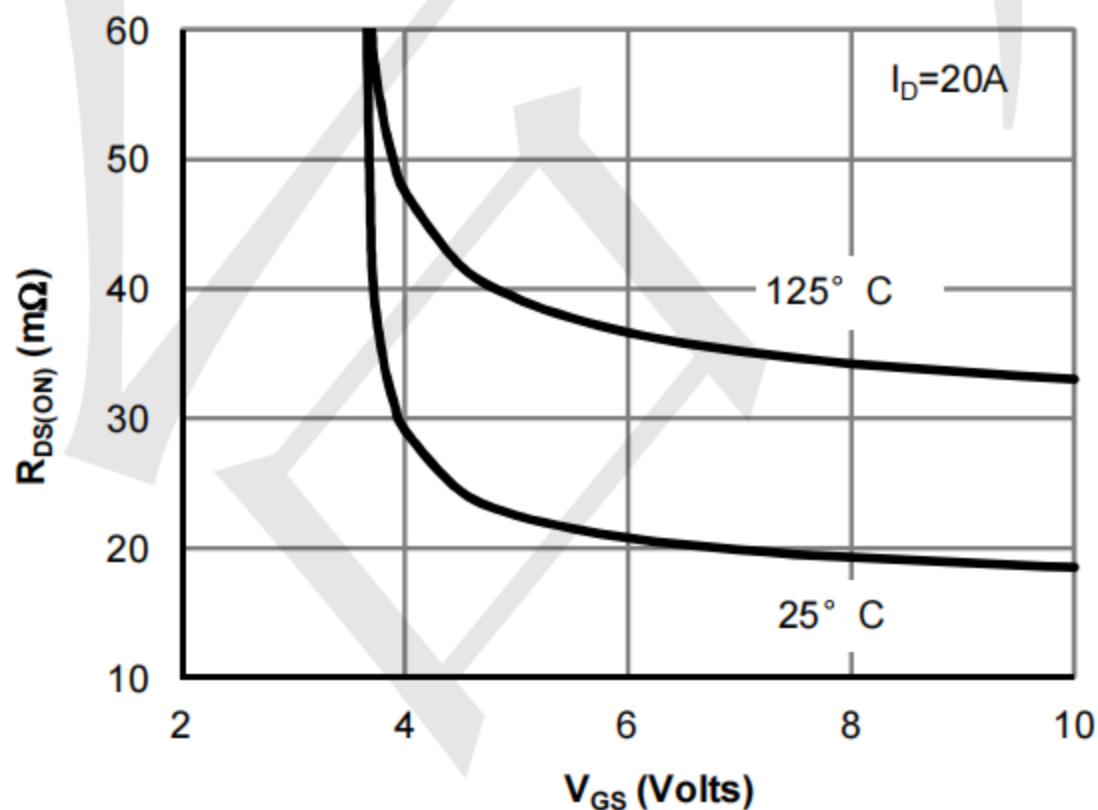


Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

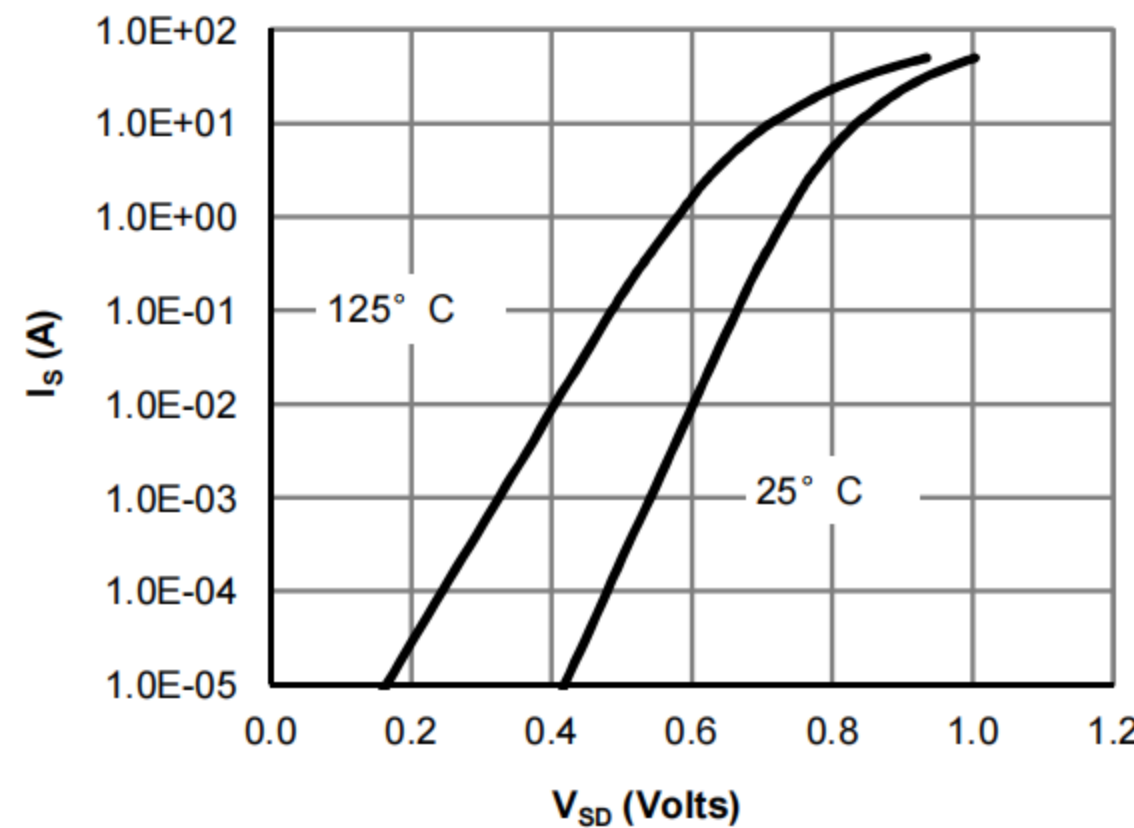


Figure 6: Body-Diode Characteristics (Note E)



Typical Performance Characteristics (T_A=25°C unless otherwise Specified)

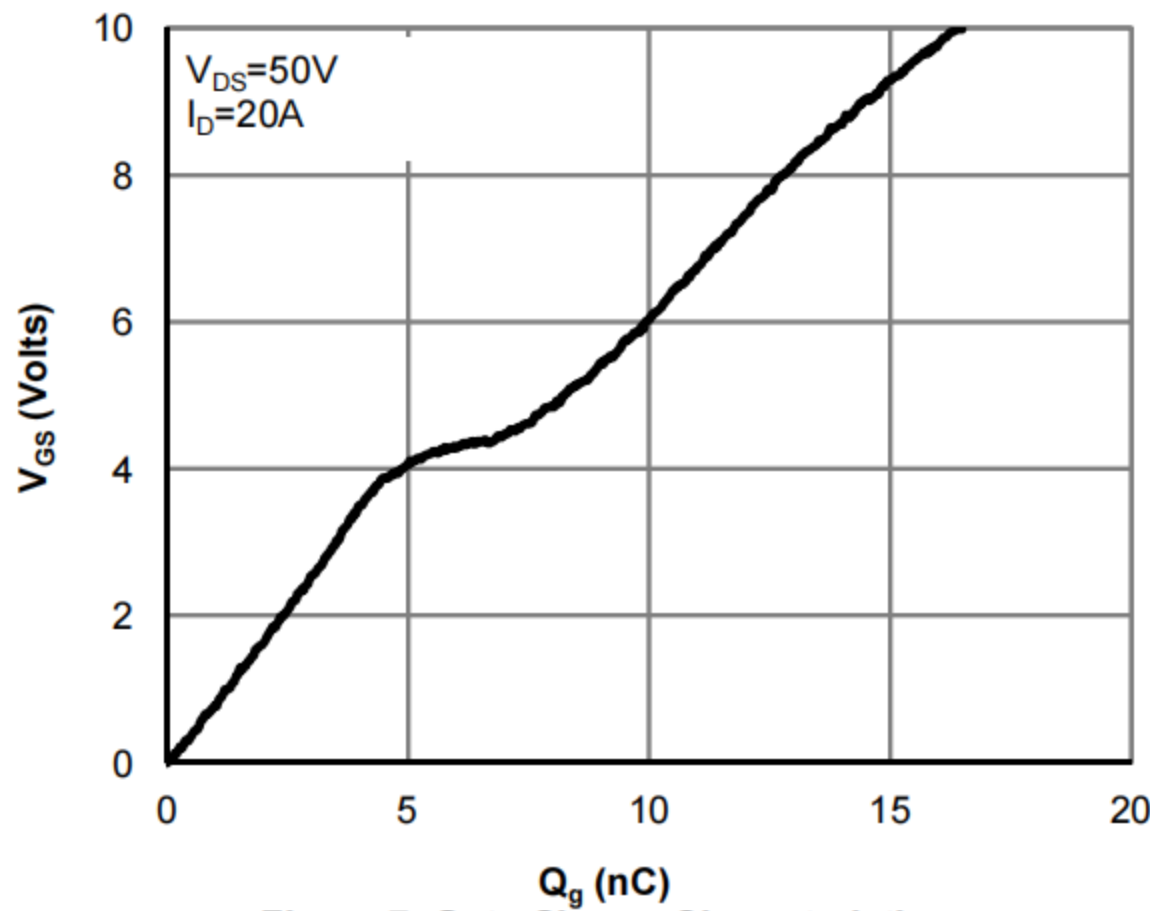


Figure 7: Gate-Charge Characteristics

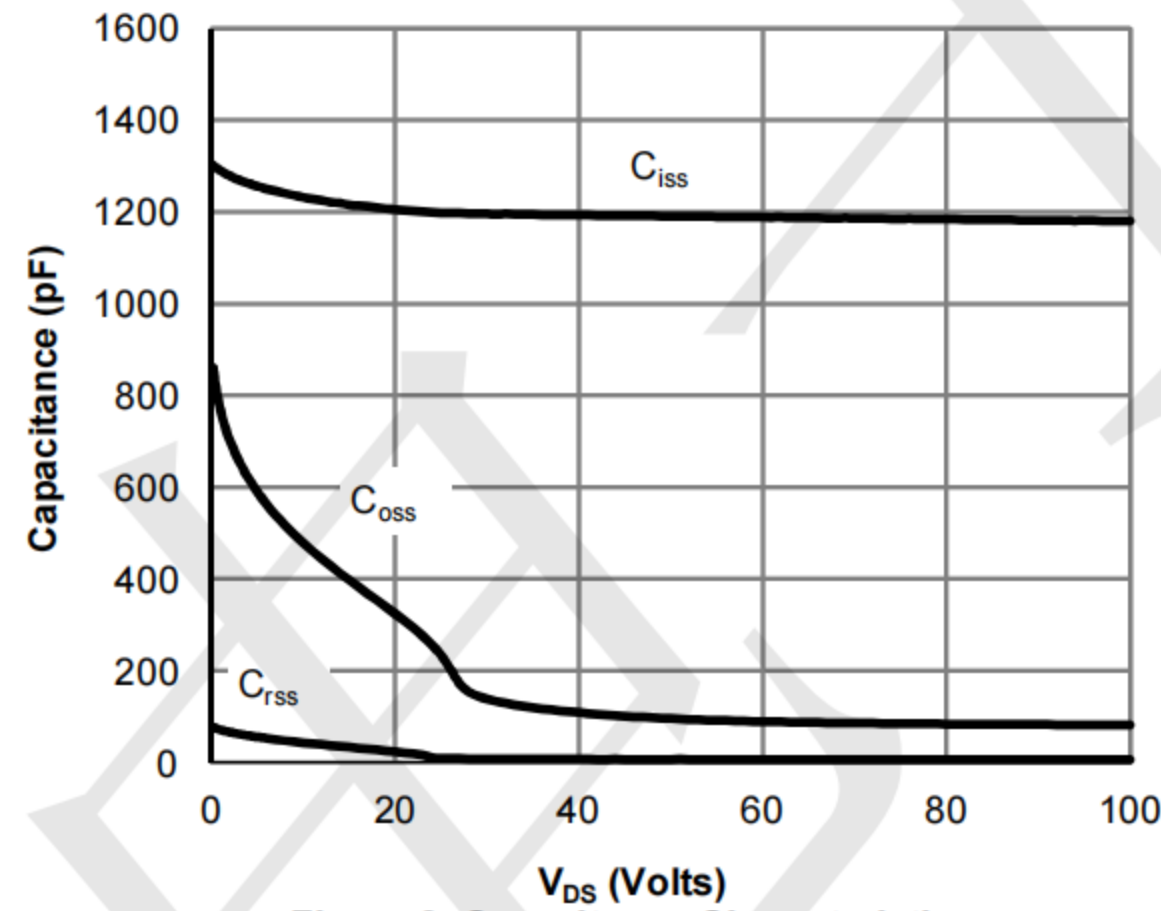


Figure 8: Capacitance Characteristics

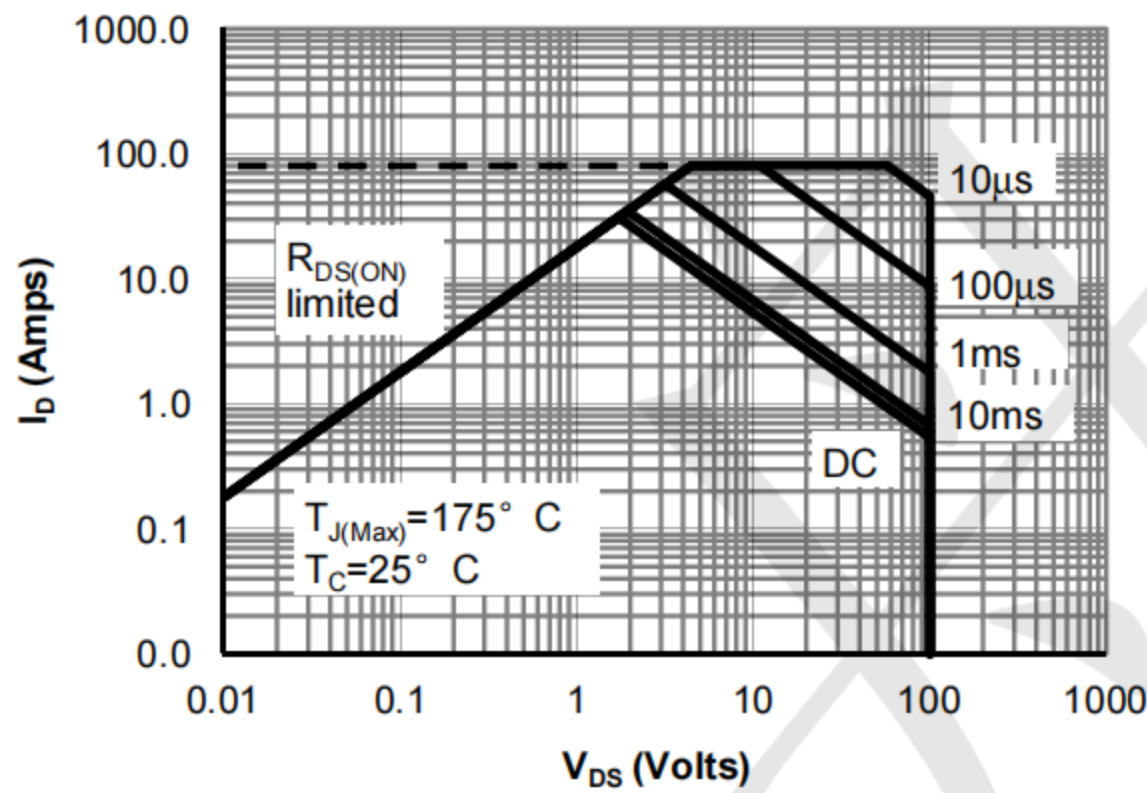


Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

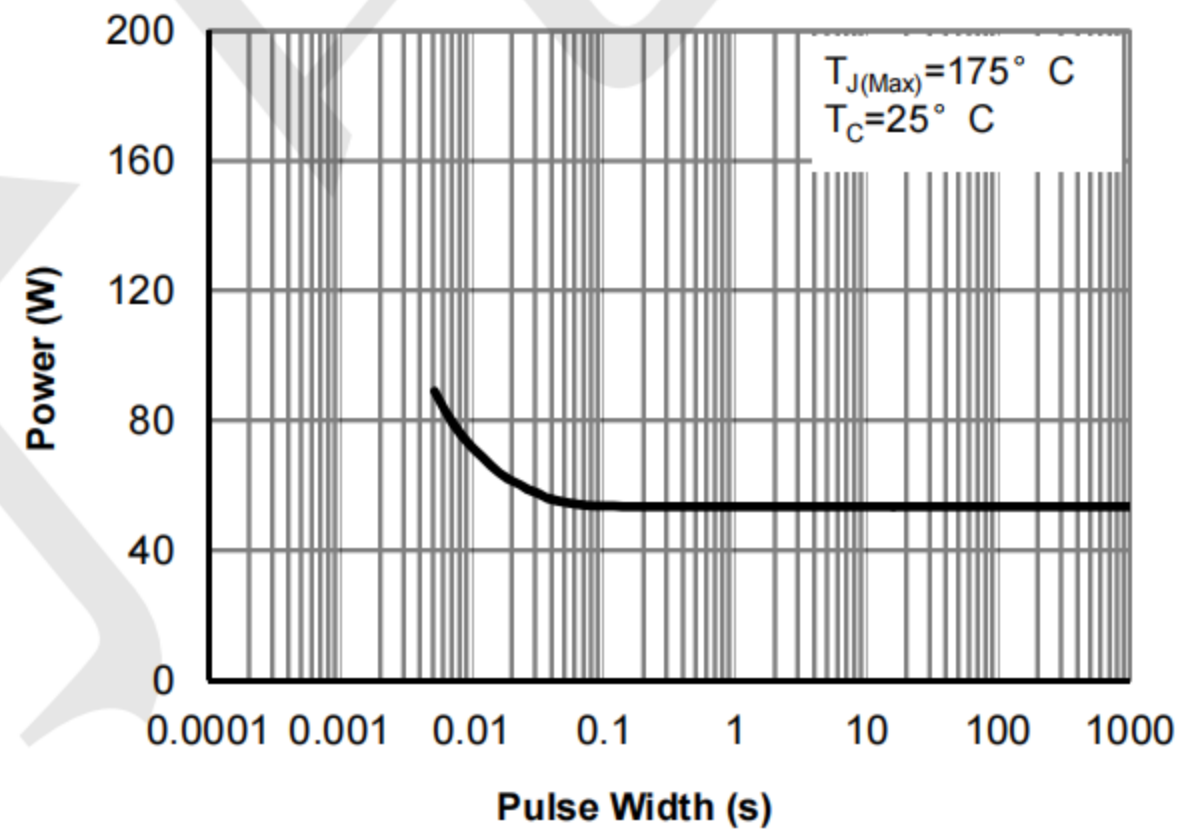


Figure 10: Single Pulse Power Rating Junction-to-Case (Note F)

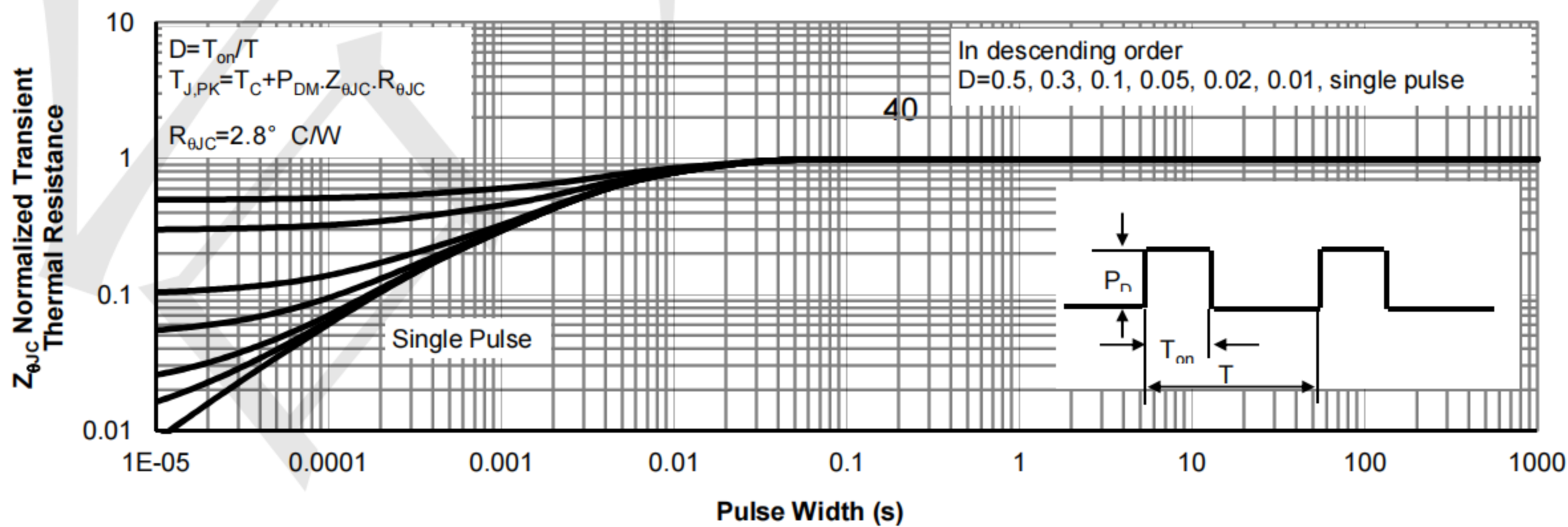


Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)



Typical Performance Characteristics (T_A=25°C unless otherwise Specified)

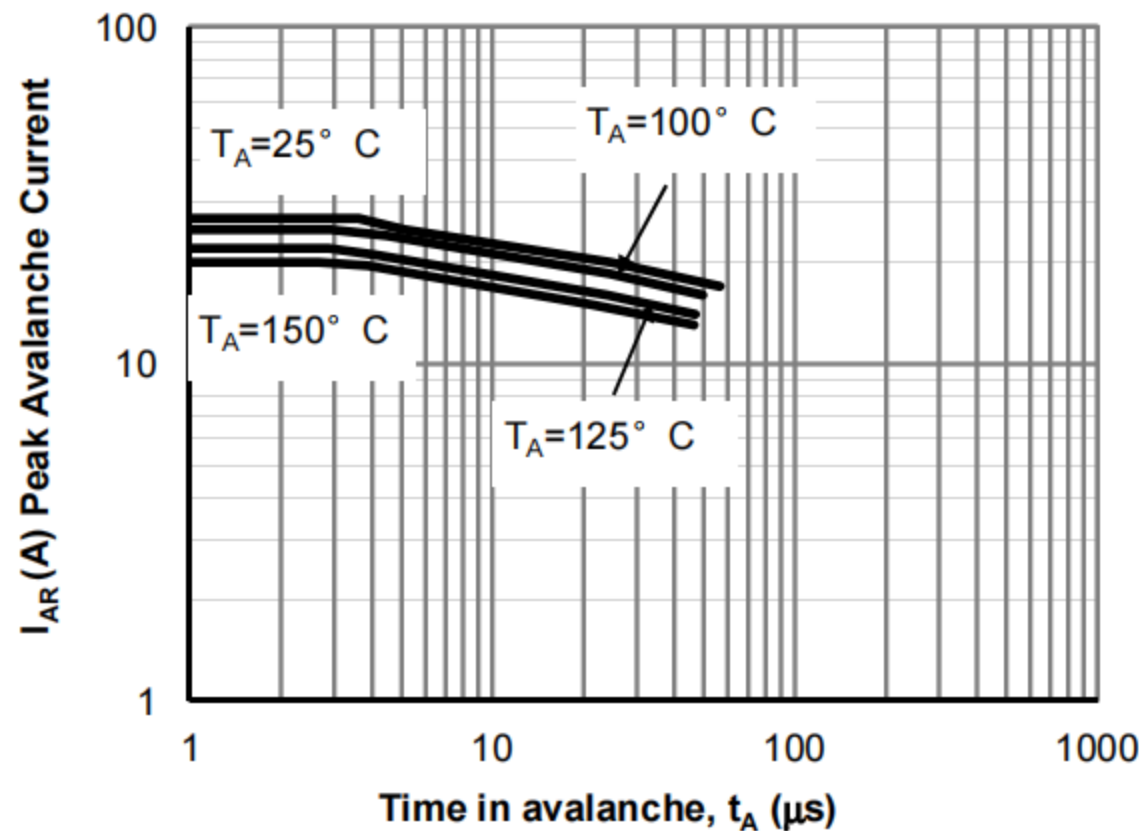


Figure 12: Single Pulse Avalanche capability (Note C)

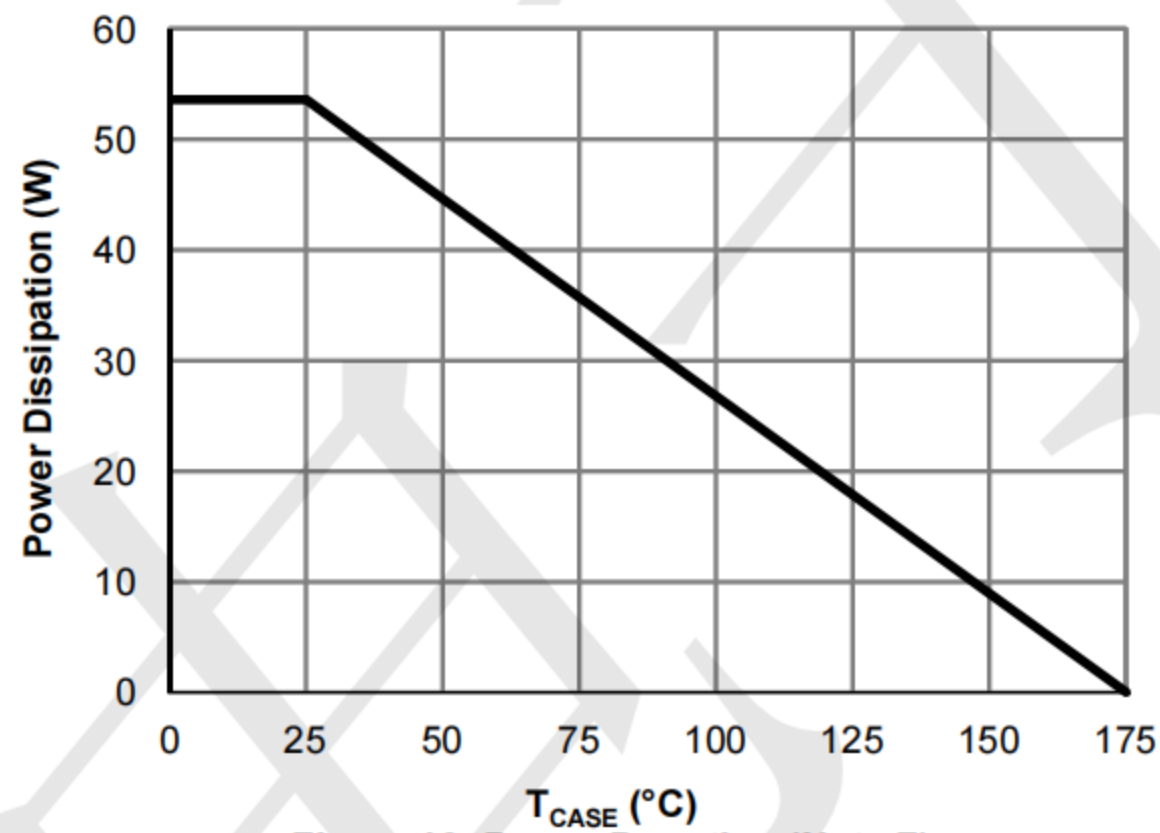


Figure 13: Power De-rating (Note F)

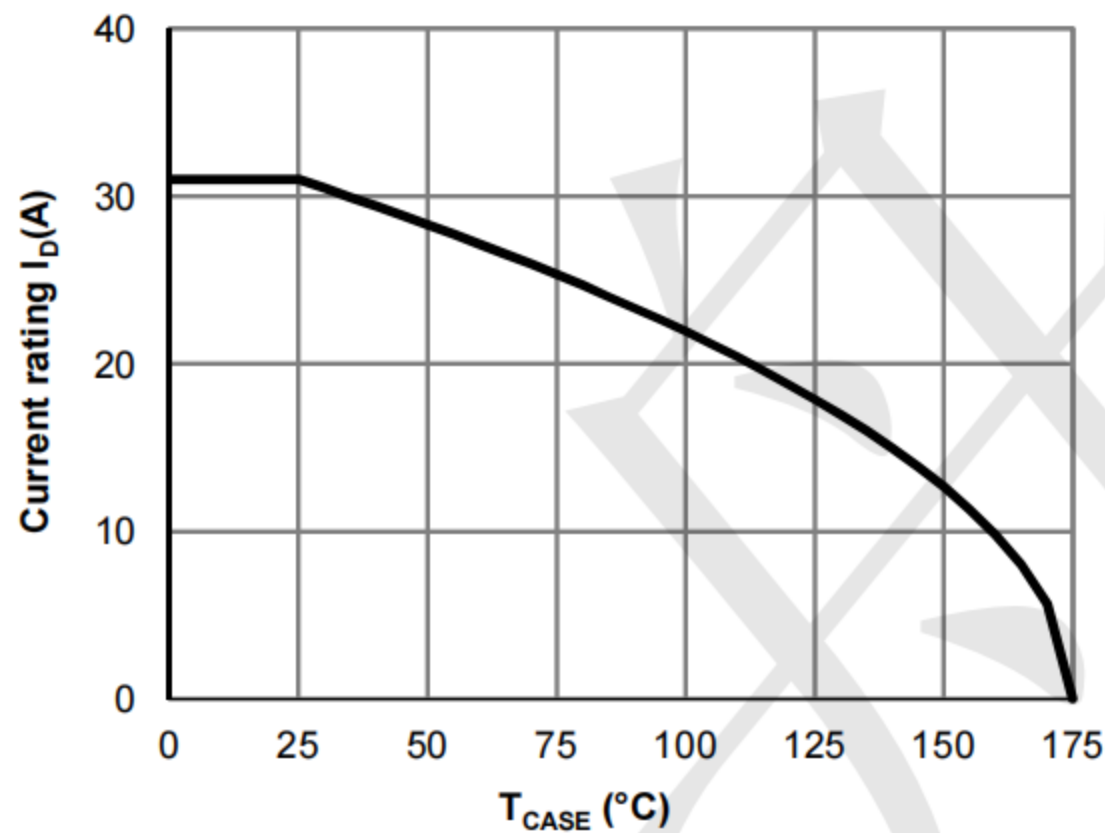


Figure 14: Current De-rating (Note F)

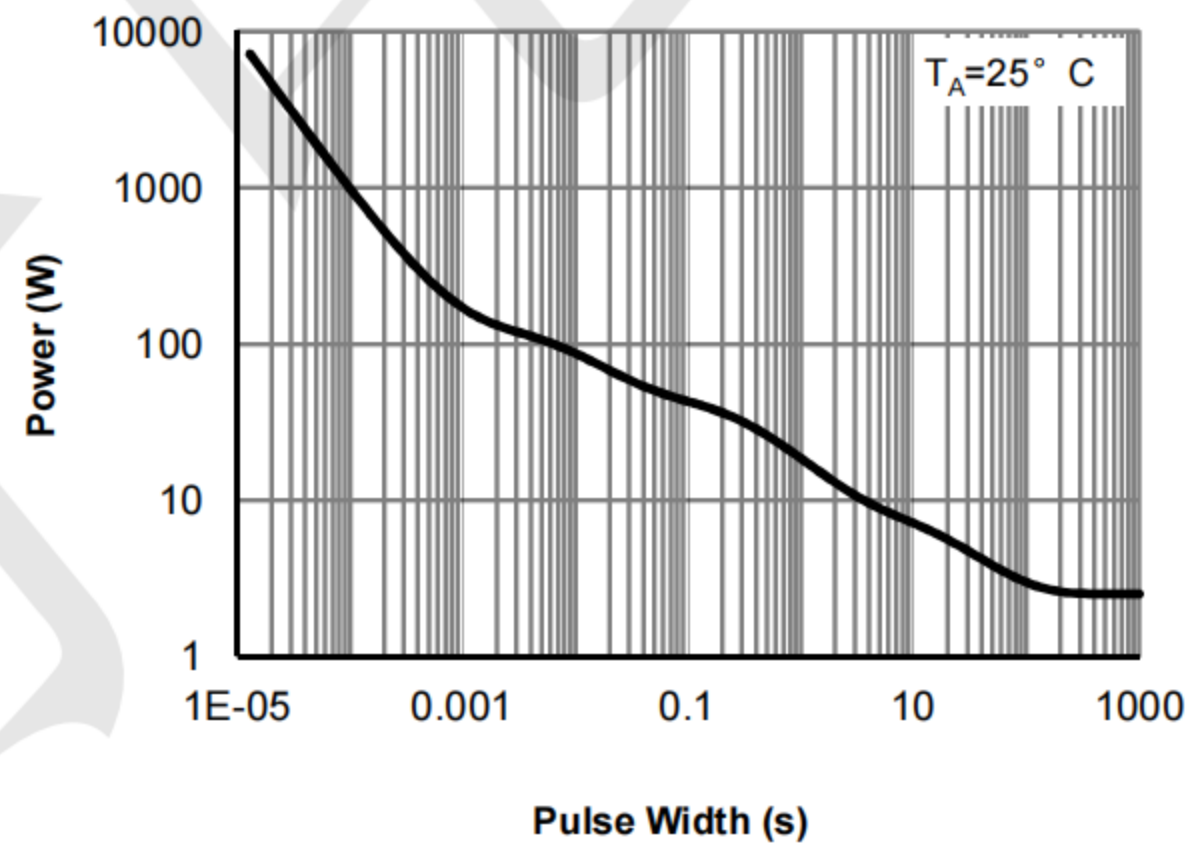


Figure 15: Single Pulse Power Rating Junction-to-Ambient (Note H)

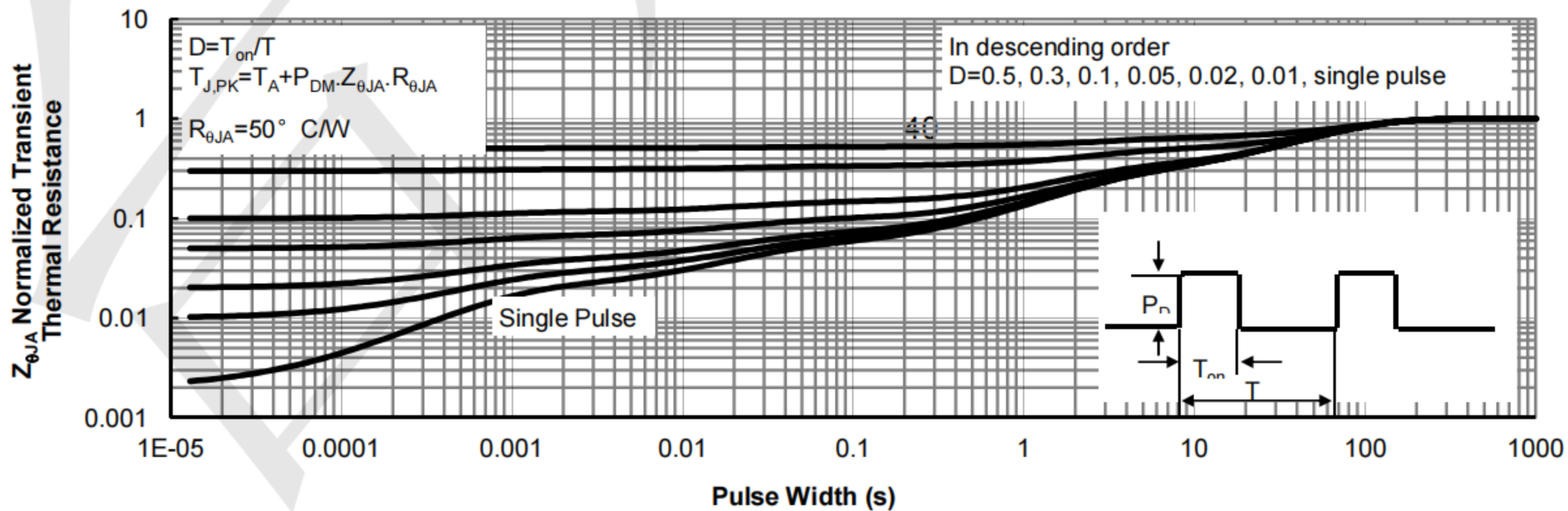
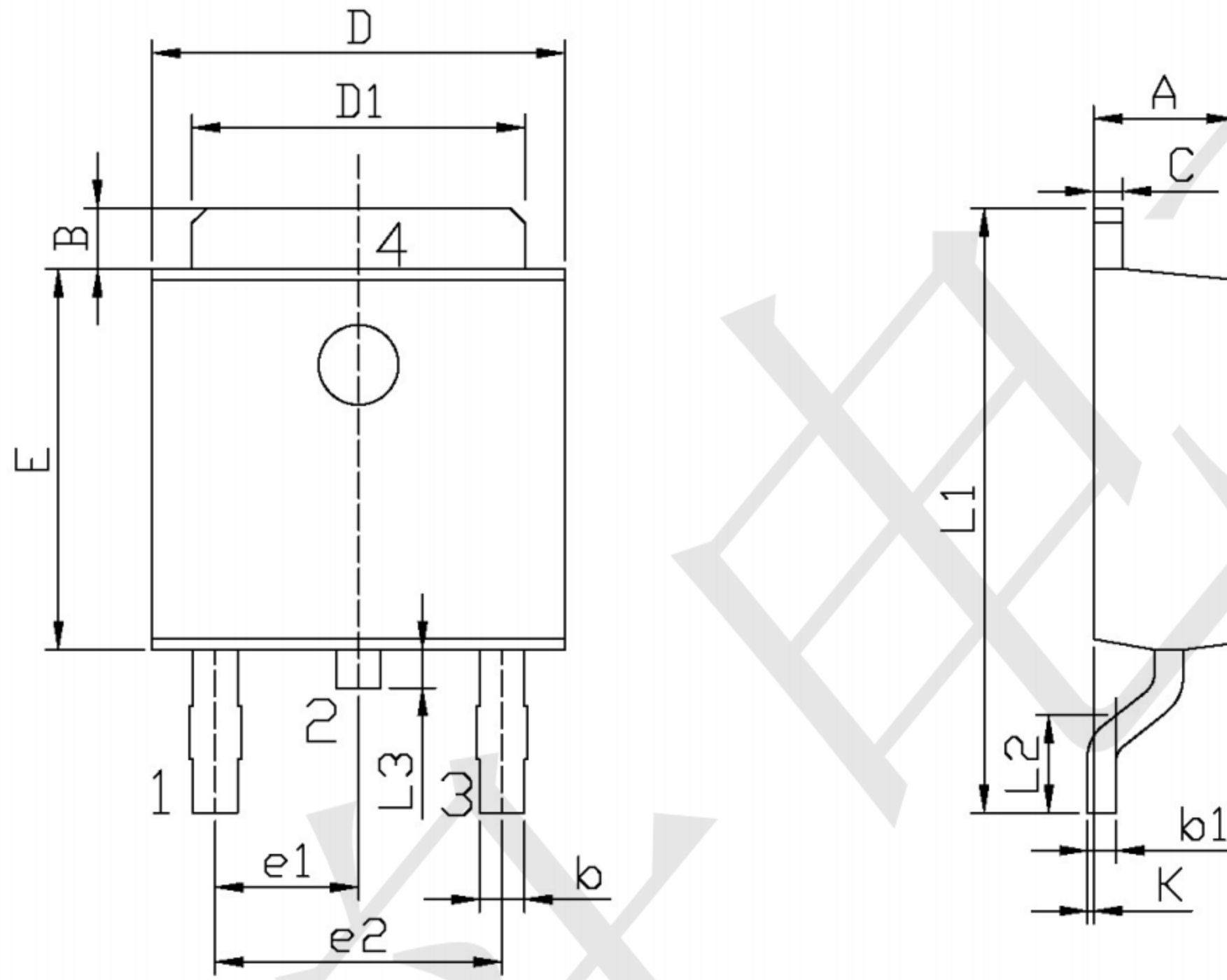


Figure 16: Normalized Maximum Transient Thermal Impedance (Note H)



Outline Drawing - TO-252 (unit:mm)



单位: mm

Symbol	Dimensions In Millimeters		Symbol	Dimensions In Millimeters	
	Min	Max		Min	Max
A	2.20	2.40	E	5.95	6.25
B	0.95	1.25	e1	2.24	2.34
b	0.50	0.70	e2	4.43	4.73
b1	0.45	0.55	L1	9.45	9.95
C	0.45	0.55	L2	1.25	1.75
D	6.45	6.75	L3	0.60	0.90
D1	5.10	5.50	K	0.00	0.10

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