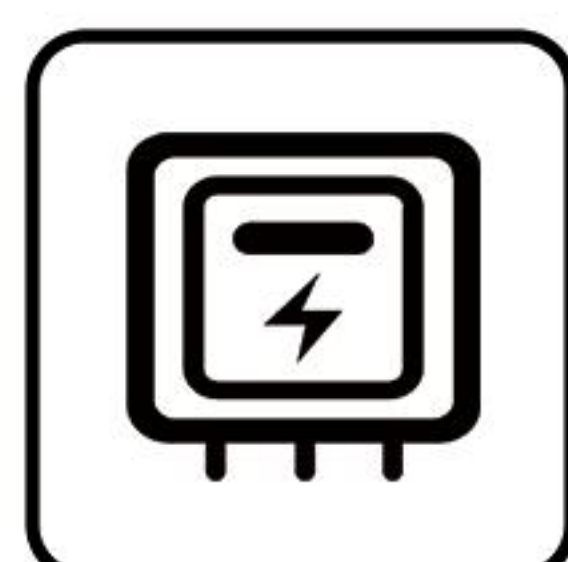


TDSEMIC

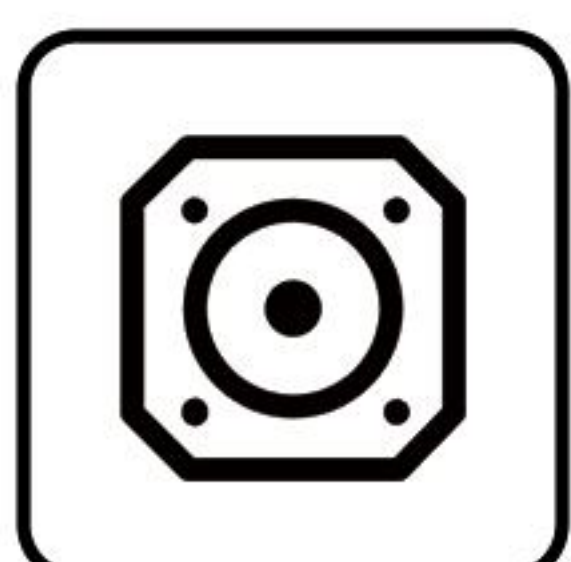
拓電半導體

自主封測 品質把控 售後保障

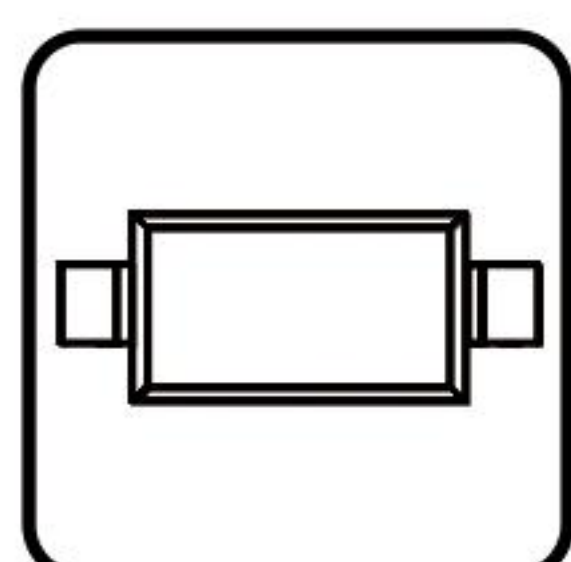
WEB | WWW.TDSEMIC.COM



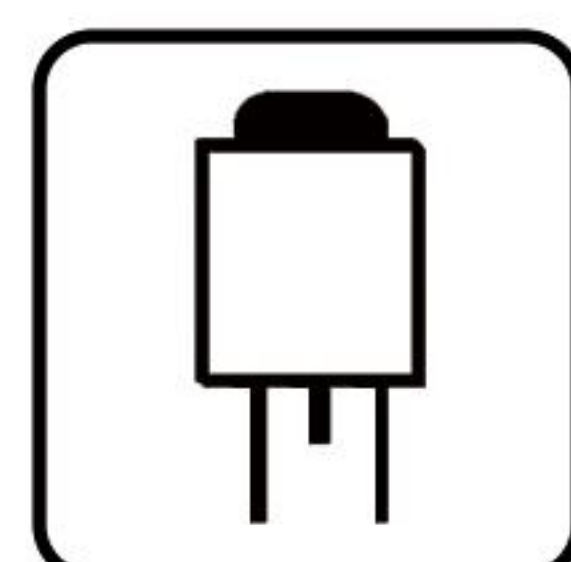
電源管理



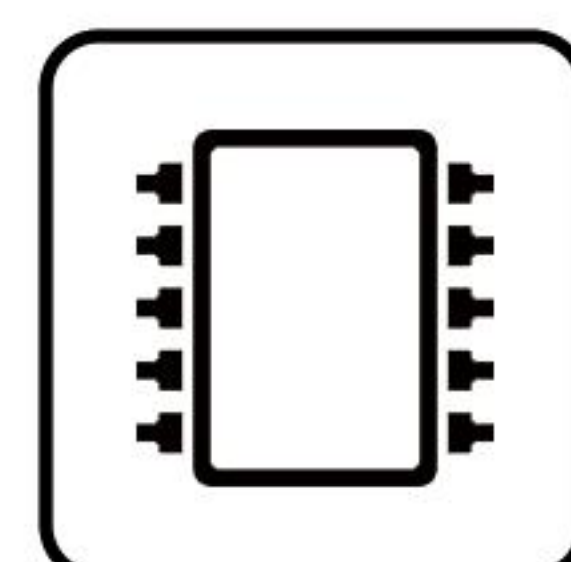
顯示驅動



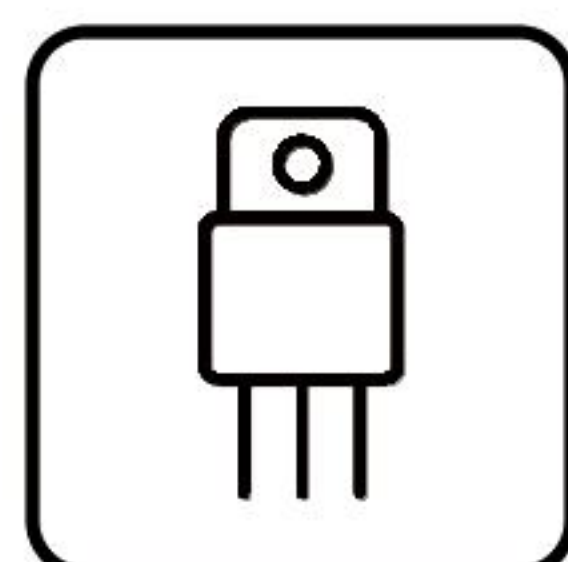
二三極管



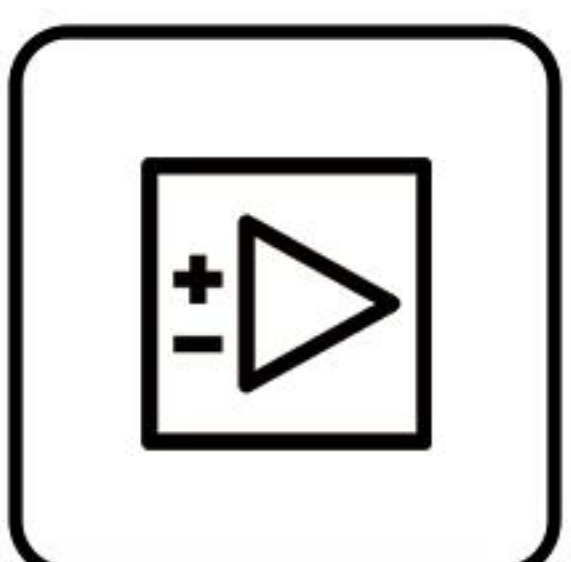
LDO穩壓器



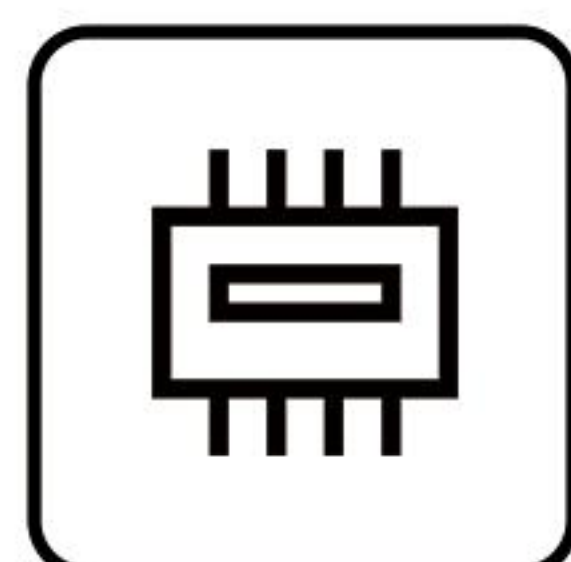
觸摸芯片



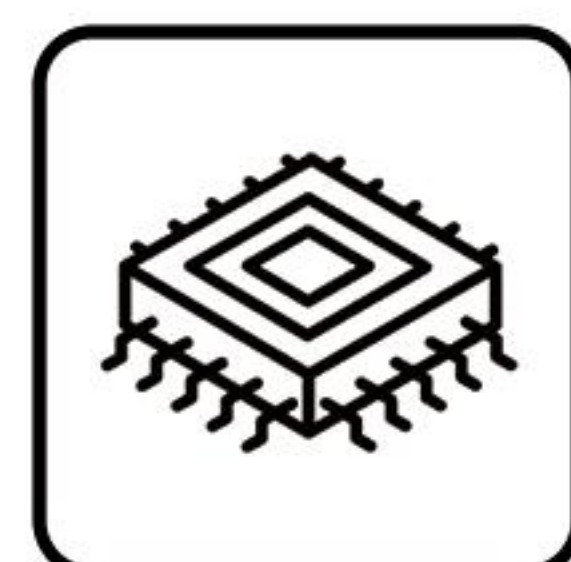
MOS管



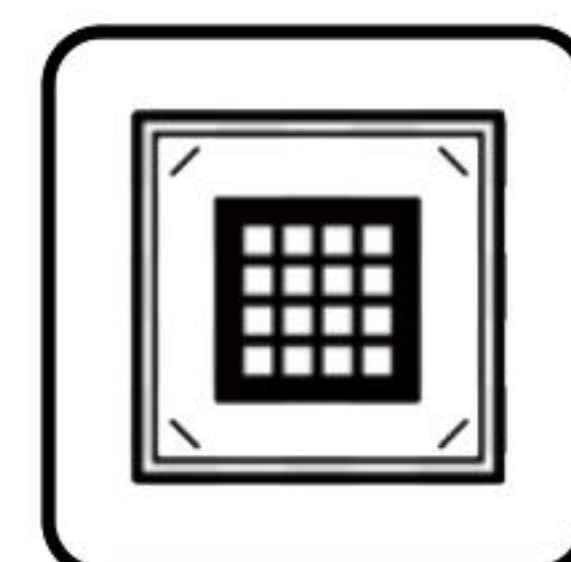
運算放大器



存儲芯片



MCU



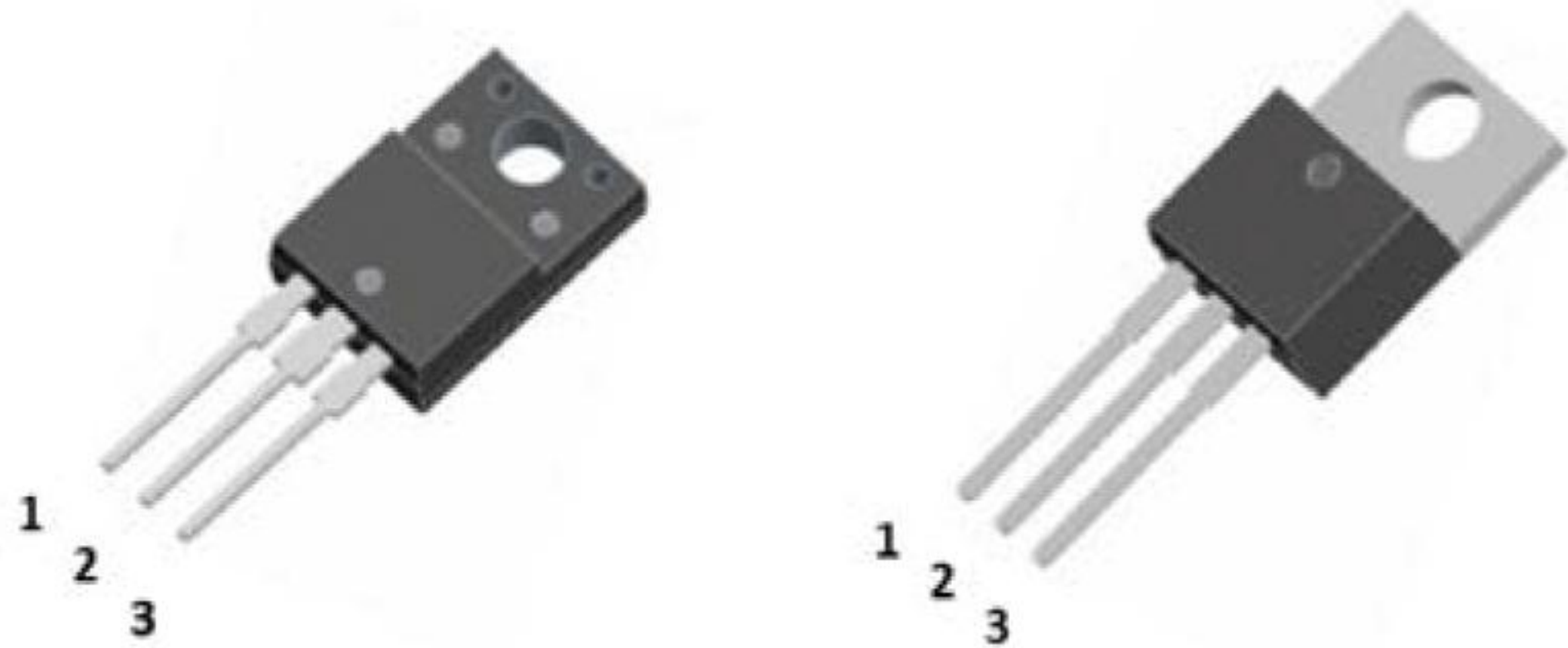
串口通信

10N65-TD-TO220F

產品規格說明書

V_{DS} = 650V
 $I_D(T_C=25^{\circ}C)$ = 10A
 $R_{DS(on),max}$ = $1\Omega@V_{GS}=10V$
 $Q_{g,typ}$ = 34.2nC

TO-220F-3L TO-220



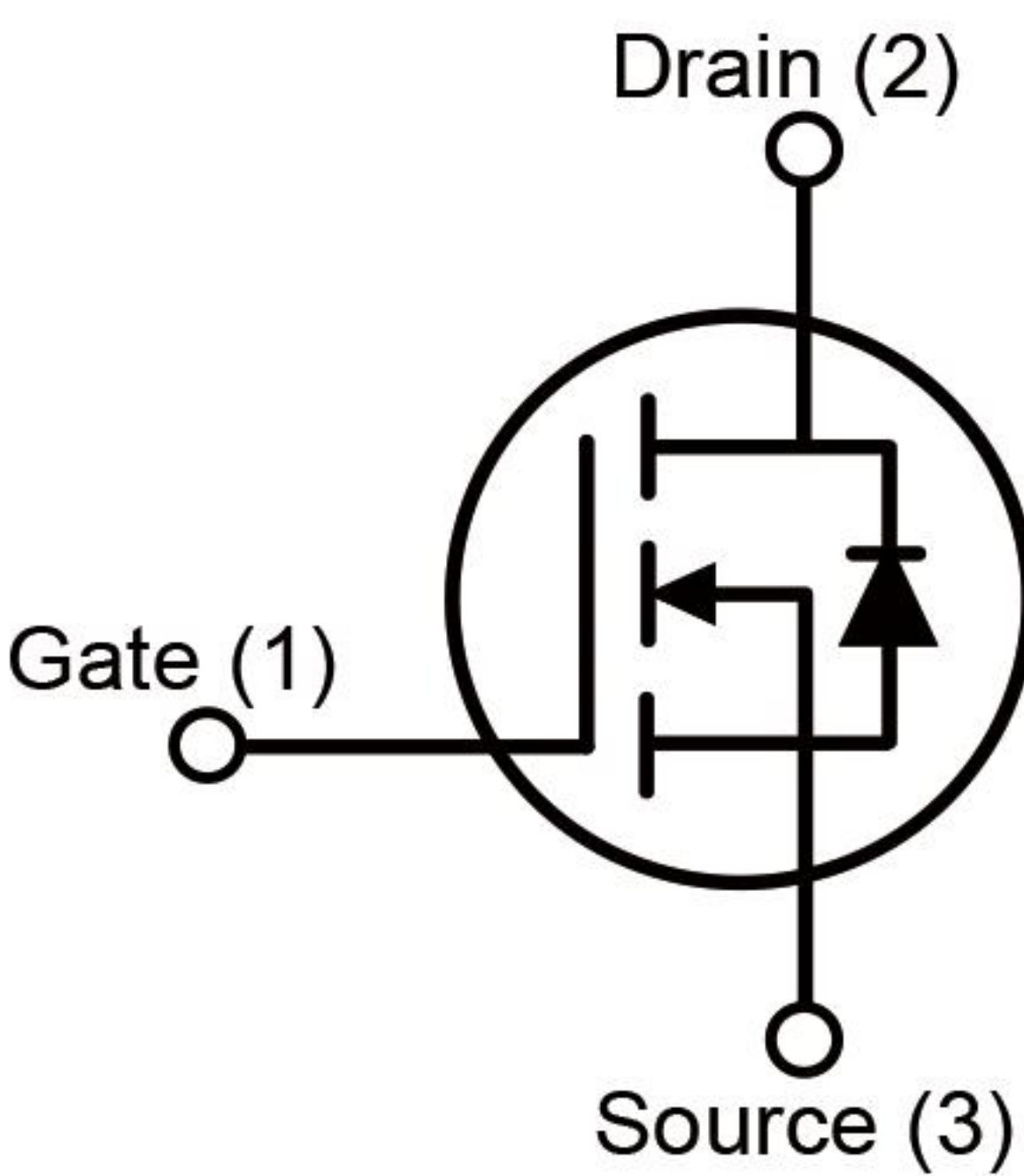
Features

- Low Gate Charge
- Low Capacitance Fast Switching
- Halogen Free, RoHS Compliant
- 100% UIS tested

Applications

- High Frequency Switching Mode Power Supply
- Motor Driver
- LED Power Supply

Schematic Diagram



Package Marking and Ordering Information

Part Number	Marking	Package	Form	MOQ
10N65	10N65	TO-220F-3L	Tube	1000
10N65	10N65	TO-220	Tube	1000

Maximum Ratings($T_C=25^{\circ}C$ Unless Otherwise Noted)

Symbol	Parameter	Value	Unit
V_{DSS}	Drain-Source Voltage	650	V
V_{GSS}	Gate-Source Voltage	± 30	V
$I_D^{①}$	Continuous Drain Current($V_{GS}=10V$)	$T_C=25^{\circ}C$	A
		$T_C=100^{\circ}C$	
T_j	Maximum Junction Temperature	150	$^{\circ}C$
T_{stg}	Storage Temperature Range	-55 to 150	$^{\circ}C$
P_D	Power Dissipation TO-220F	40	W
	Power Dissipation TO-220	100	
$E_{AS}^{②}$	Avalanche Energy, Single Pulsed	500	mJ

Thermal Characteritics

Symbol	Parameter	Value		Unit
		TO-220F	TO-220	
$R_{th(j-c)}$	Thermal Resistance-Junction to Case	2.27	1.31	°C/W
$R_{th(j-a)}$	Thermal Resistance-Junction to Ambient	62.5	100	°C/W

Electrical Characteristics (Defined at $T_j=25^{\circ}\text{C}$ Unless OtherwiseSpecified)

Static Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_{DS}=250\mu A$	650			V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=650V, V_{GS}=0V$			1	μA
		$V_{DS}=520V, V_{GS}=0V, T_j=125^{\circ}\text{C}$			100	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_{DS}=250\mu A$	2		4	V
I_{GSS}	Gate Leakage Current	$V_{GS}=\pm 30V, V_{DS}=0V$			± 100	nA
$R_{DS(on)}^{(3)}$	Drain-Source On-state Resistance	$V_{GS}=10V, I_{DS}=5A$		0.81	1.0	Ω

Diode Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
$V_{SD}^{(3)}$	Diode Forward Voltage	$I_F=10A, V_{GS}=0V$			1.5	V
I_S	Continuous Source Current(Body Diode)				10	A
I_{SM}	Maximum Pulsed Current(Body Diode)				40	A
t_{rr}	Reverse Recovery Time	$I_F=10A, -di_F/dt=100A/\mu s, V_{GS}=0V, T_j=25^{\circ}\text{C}$		540		ns
Q_{rr}	Reverse Recovery Charge			3.4		μC

Dynamic Characteristics⁽⁴⁾

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
C_{iss}	Input Capacitance	$V_{GS}=0V, V_{DS}=25V, f=1MHz$		1622		pF
C_{oss}	Output Capacitance			144		
C_{rss}	Reverse Transfer Capacitance			7		
$t_{d(on)}$	Turn-on Delay Time	$V_{DS}=325V, I_D=10A, R_G=10\Omega, V_{GS}=10V$		14		ns
t_r	Turn-on Rise Time			34		
$t_{d(off)}$	Turn-off Delay Time			66		
t_f	Turn-off Fall Time			16		

Gate Charge Characteristics^④

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
Q _g	Total Gate Charge	V _{DS} =520V, V _{GS} =10V, I _{DS} =10A		34.2		nC
Q _{gs}	Gate-Source Charge			13		
Q _{gd}	Gate-Drain Charge			9		

- Notes:** ①Calculated continuous current based on maximum allowable junction temperature.
②Limited by T_{jmax} , $L=10mH$, $V_{DD}=50V$, $R_G=25\Omega$, Starting $T_j=25^{\circ}C$.
③Pulse test;Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
④Guaranteed by design, not subjected to production test.

Electrical Characteristics Diagrams

Figure.1 Output Characteristics

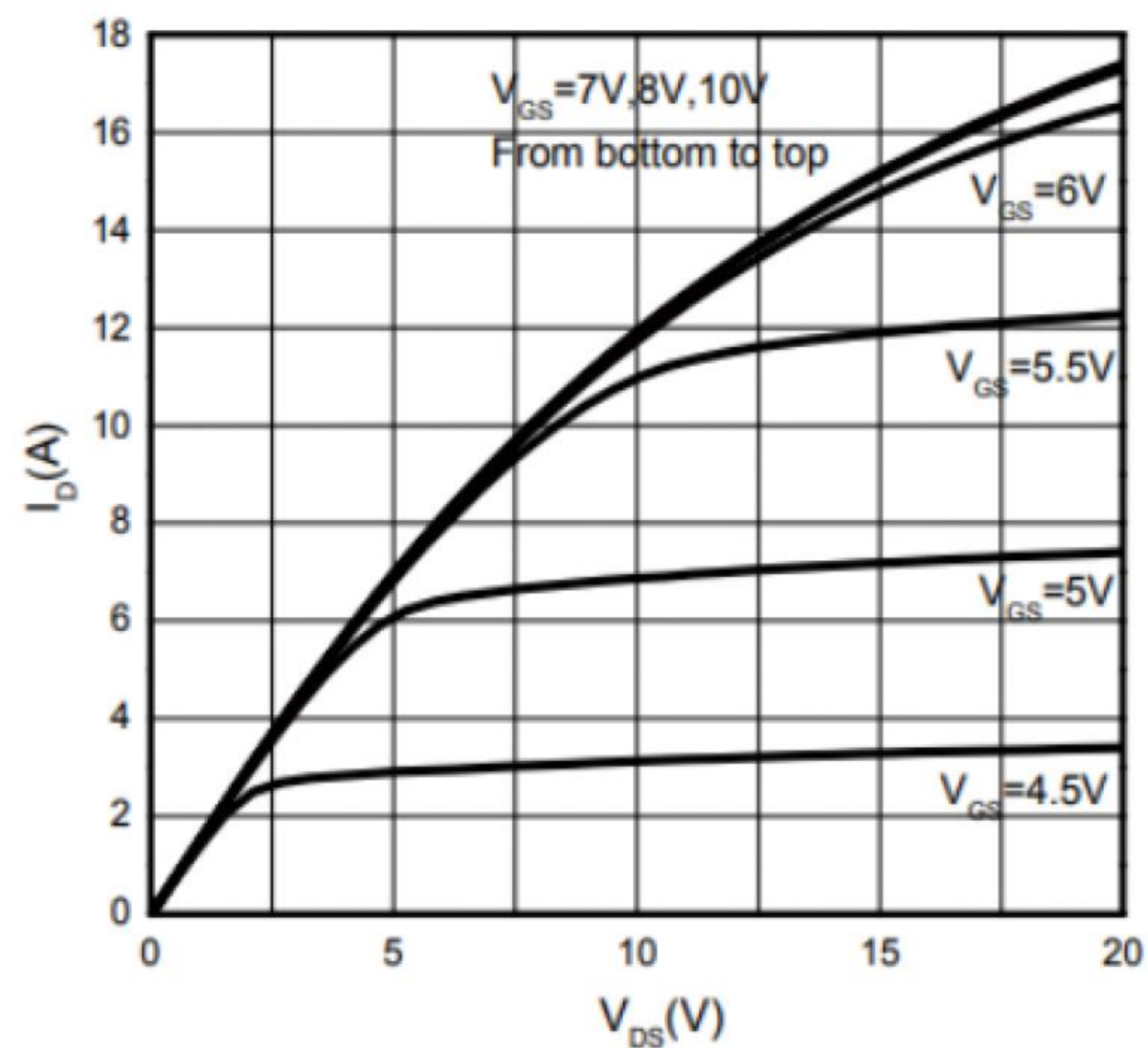


Figure.2 Transfer Characteristics

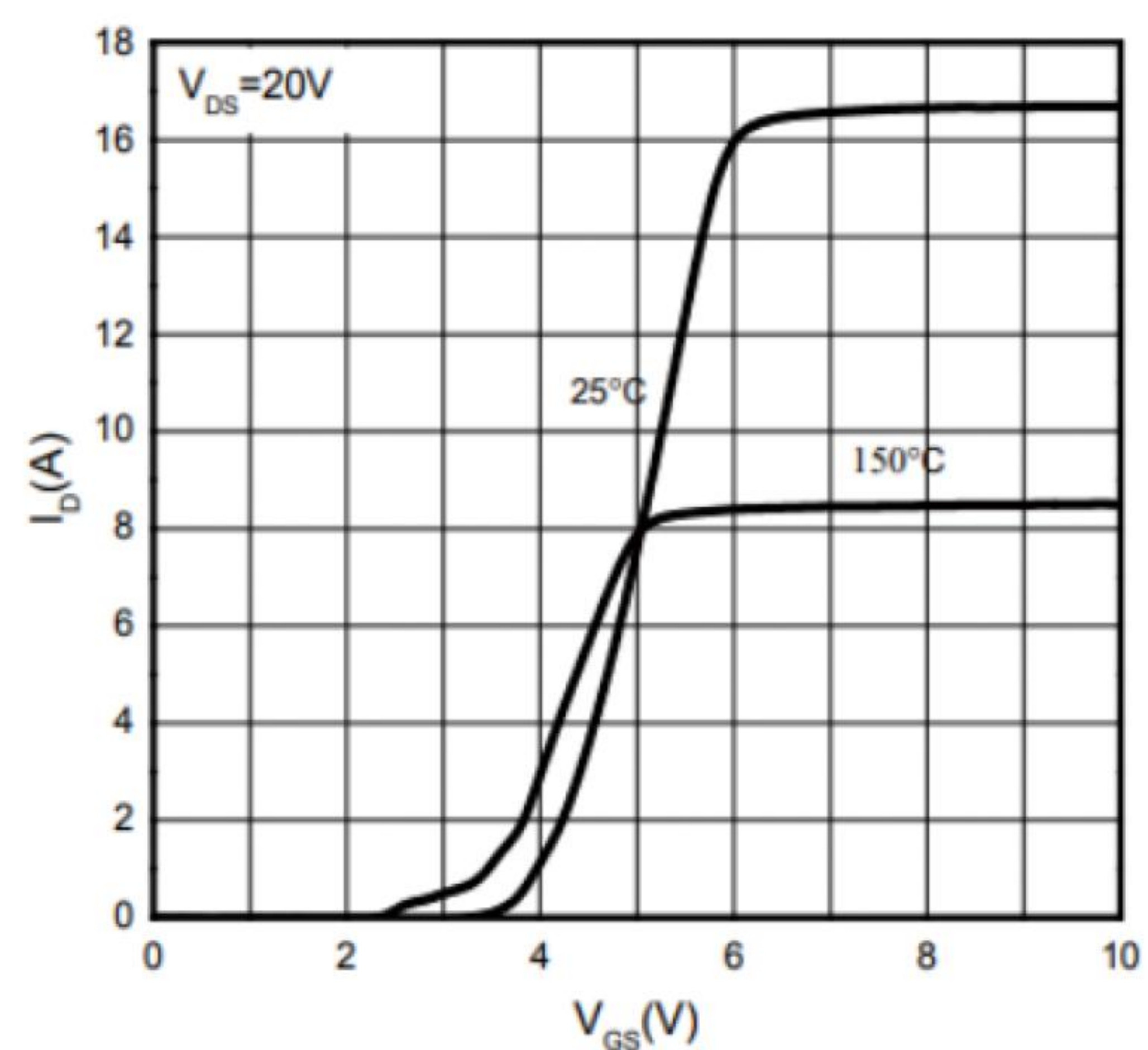


Figure.3 Capacitance Characteristics

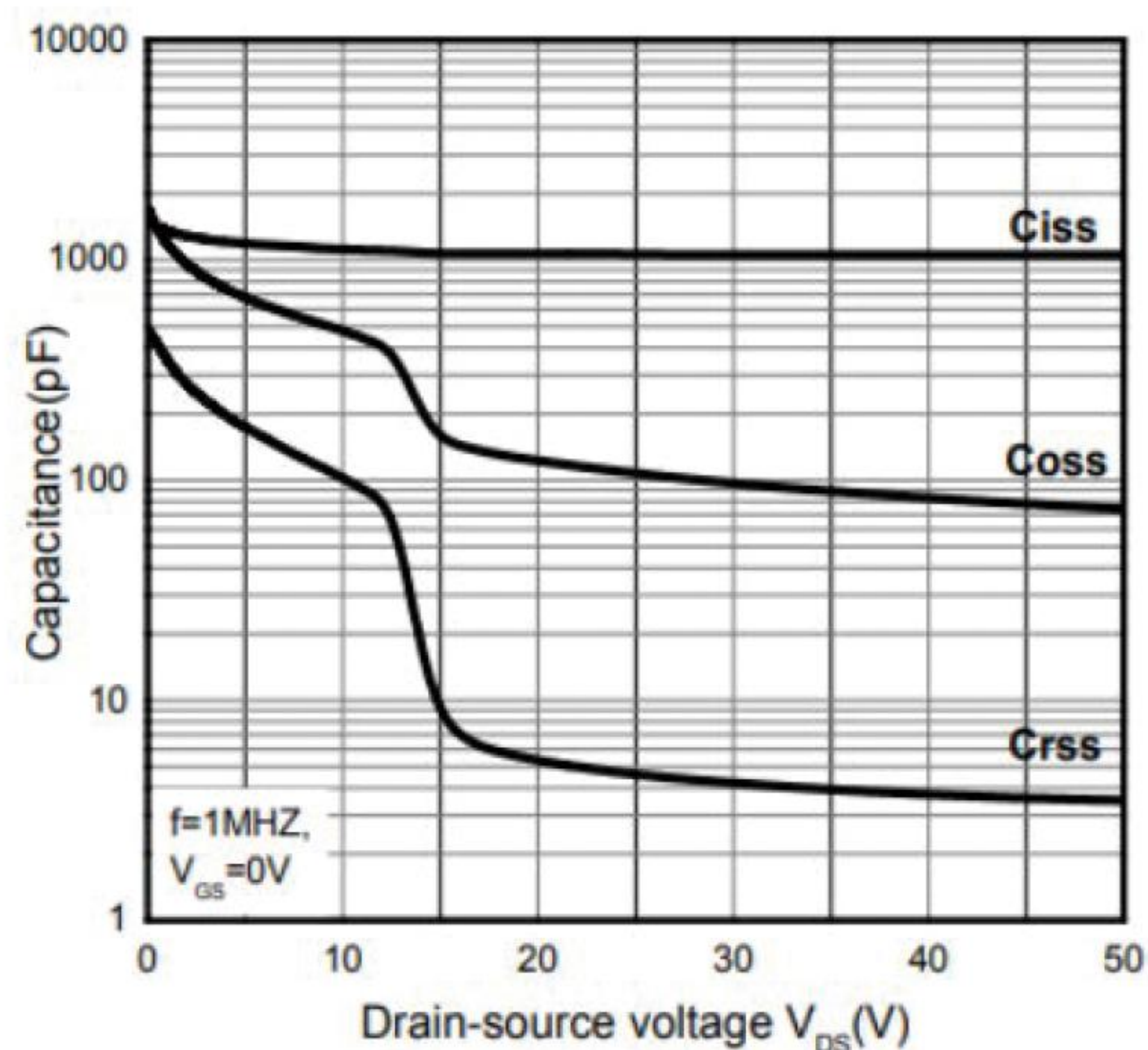


Figure.4 Gate Charge Characteristics

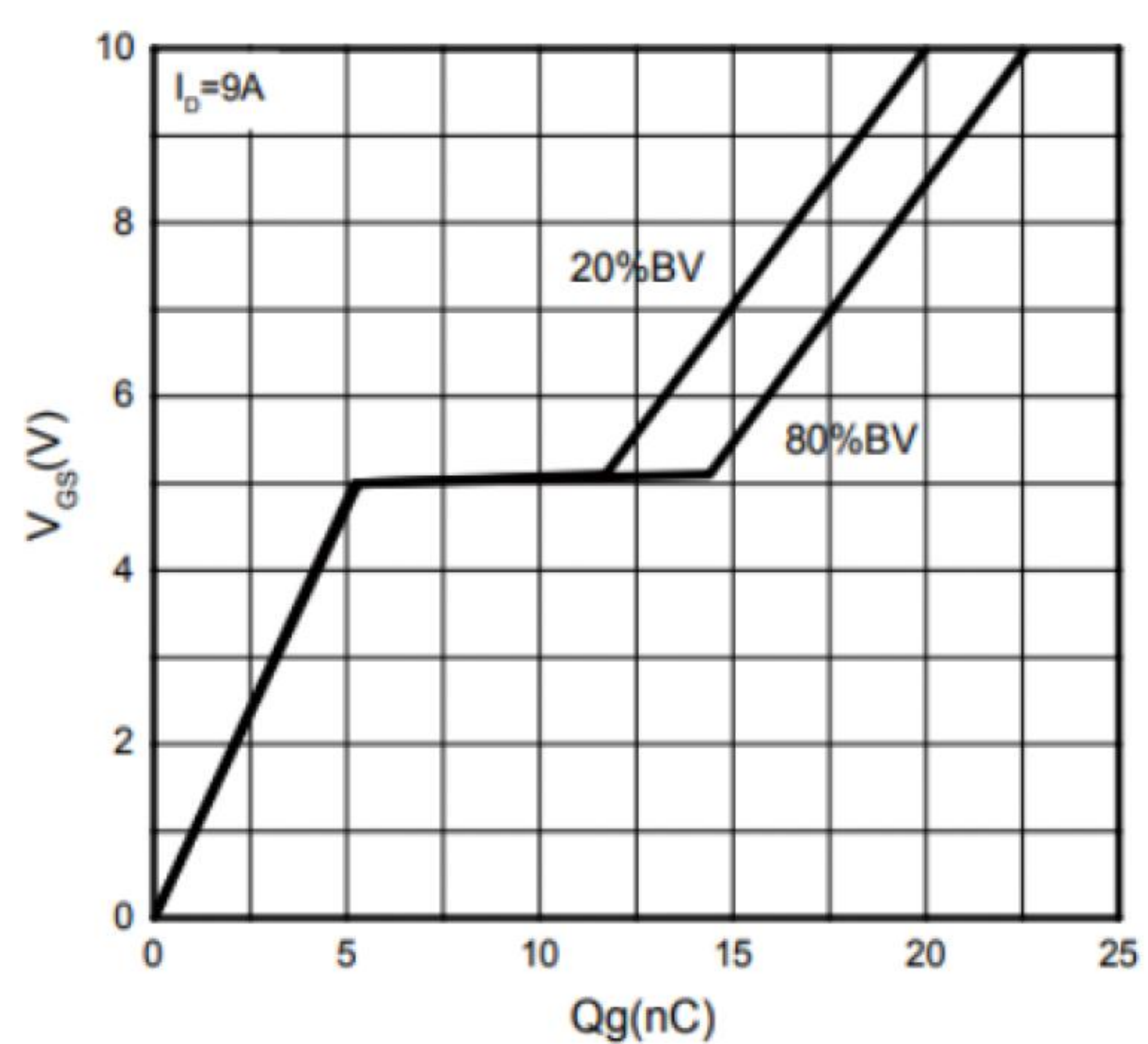


Figure.5 Drain Current Vs. Temperature

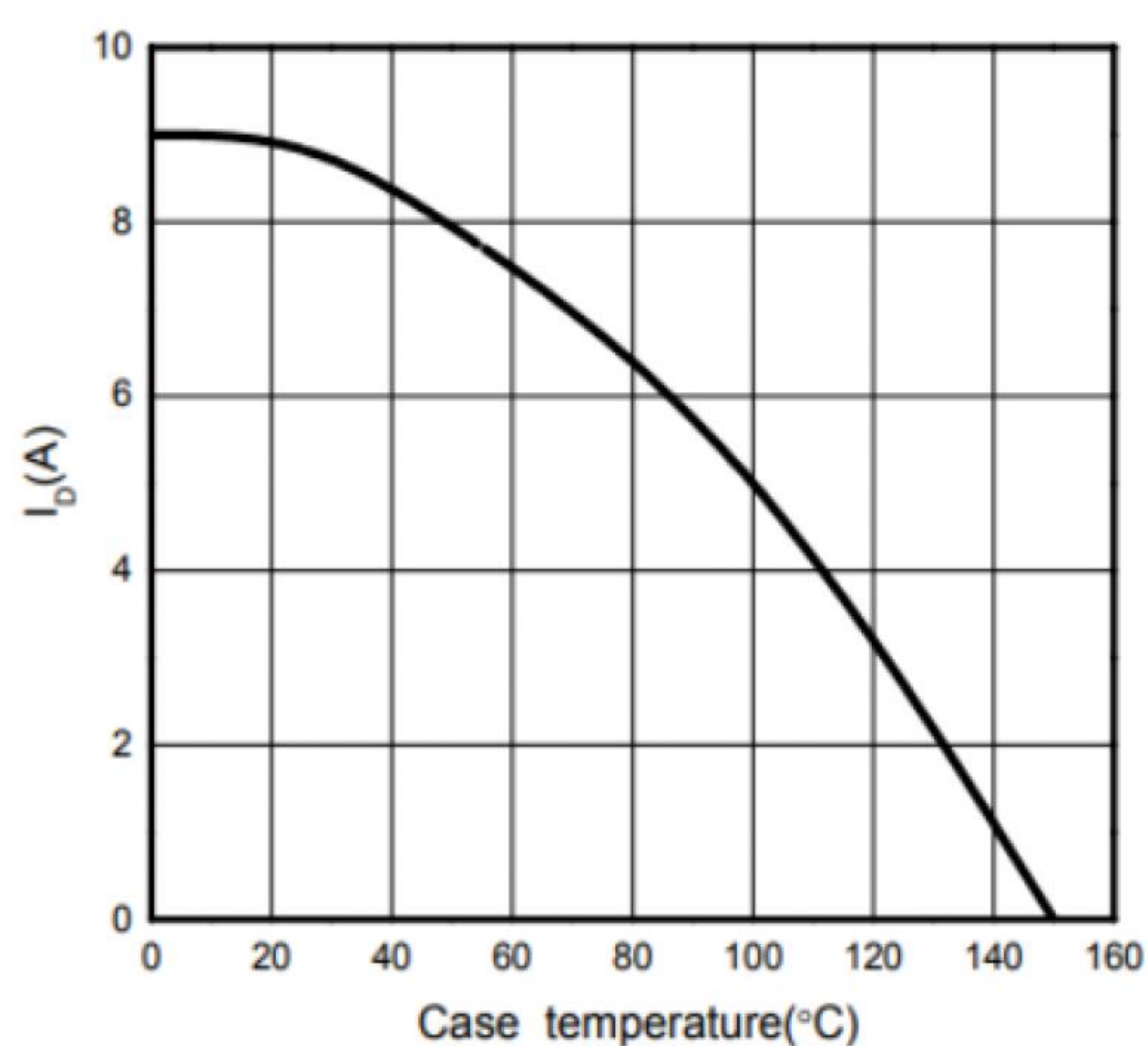
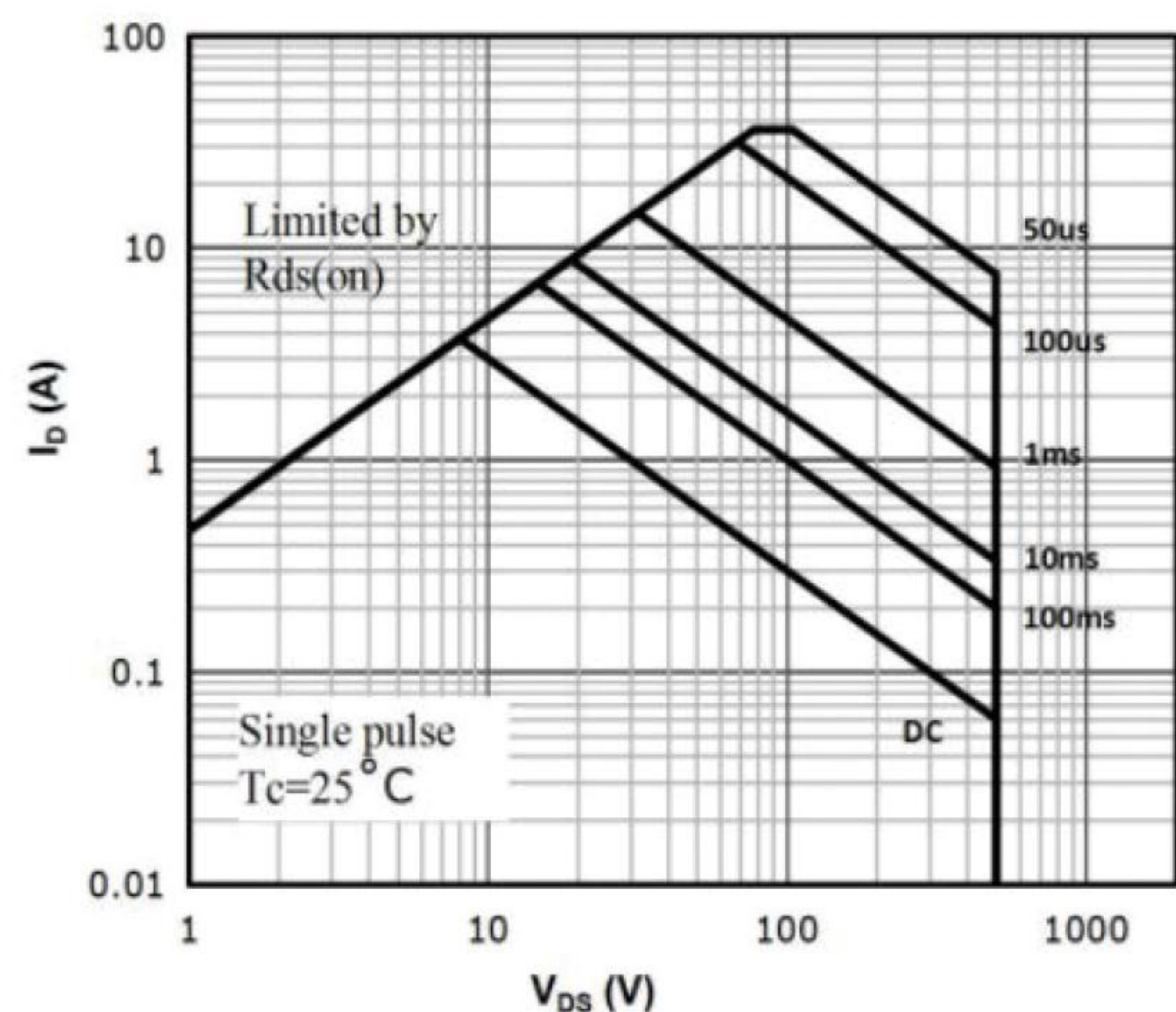
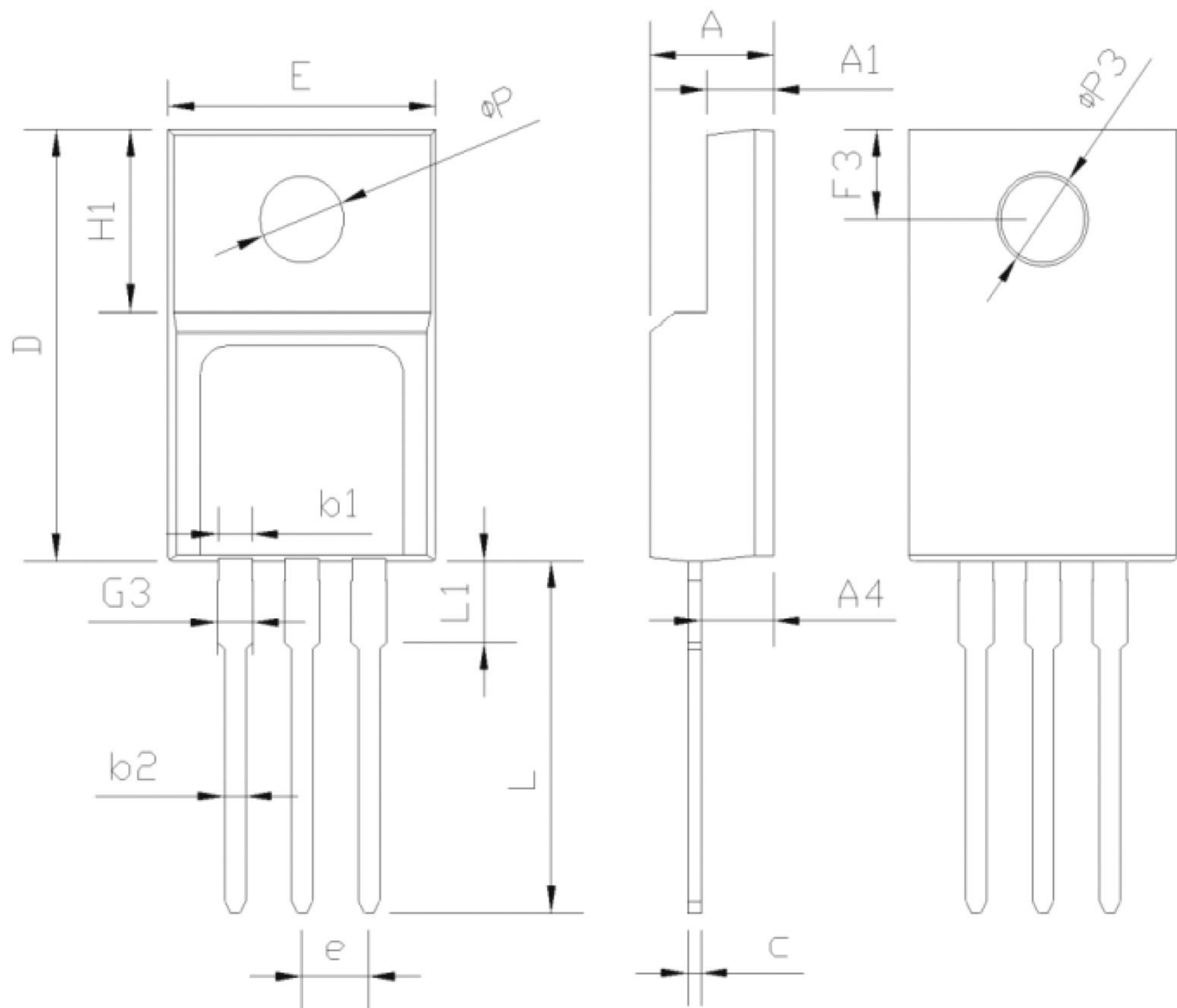


Figure.6 Safe Operating Area

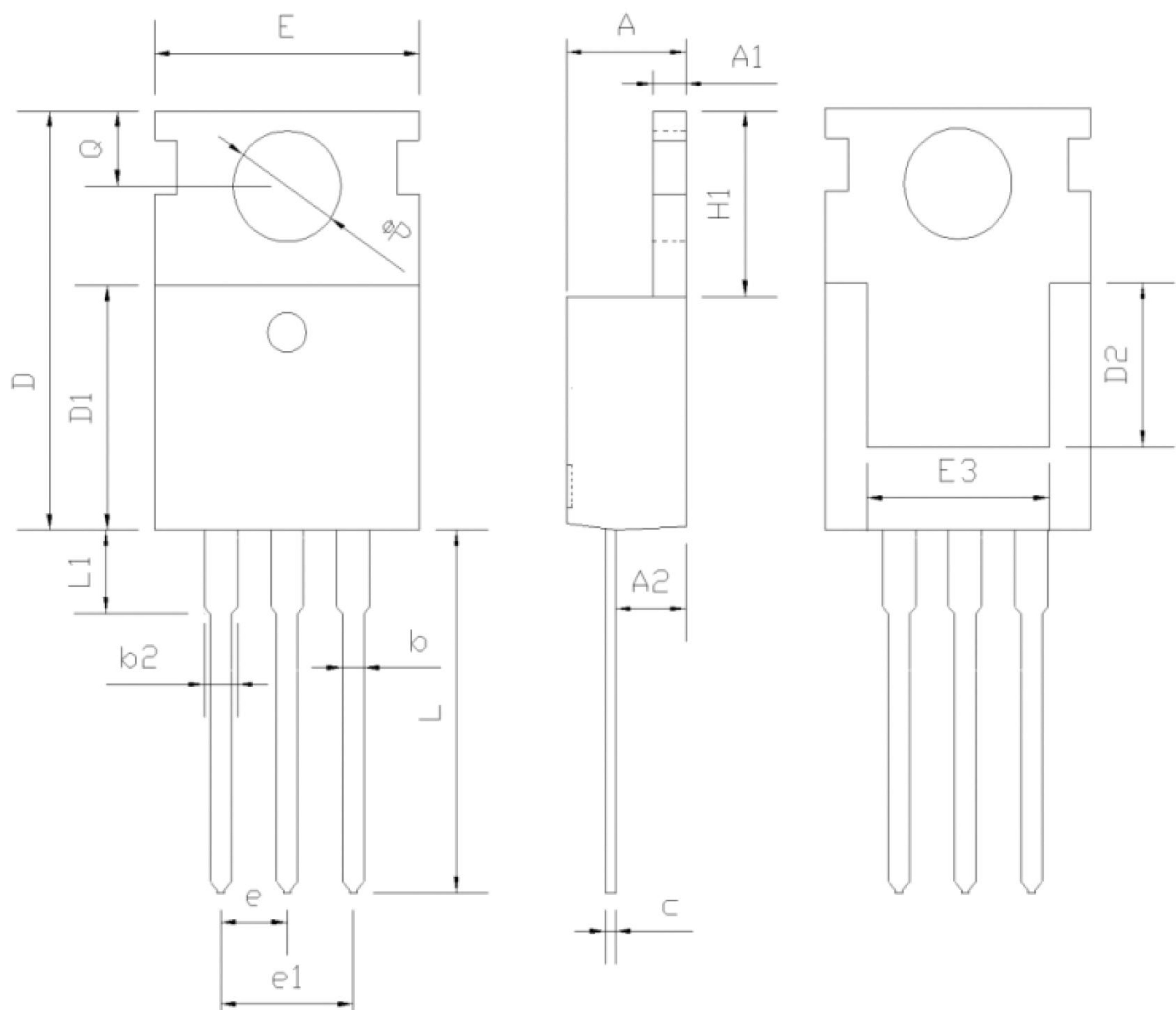


Mechanical Dimensions for TO-220F-3L



SYMBOL	mm		
	MIN.	NOM.	MAX.
E	9.96	10.16	10.36
A	4.50	4.70	4.90
A1	2.34	2.54	2.74
A4	2.56	2.76	2.96
c	0.40	0.50	0.65
D	15.57	15.87	16.17
H1	6.70REF		
e	2.54BSC		
L	12.68	12.98	13.28
L1	2.88	3.03	3.18
ϕP	3.03	3.18	3.38
$\phi P3$	3.15	3.45	3.65
F3	3.15	3.30	3.45
G3	1.25	1.35	1.55
b1	1.18	1.28	1.45
b2	0.70	0.80	0.95

Mechanical Dimensions for TO-220



SYMBOL	mm		
	MIN.	NOM.	MAX.
A	4.37	4.57	4.70
A1	1.25	1.30	1.40
A2	2.20	2.40	2.60
b	0.70	0.80	0.95
b2	1.17	1.27	1.47
c	0.45	0.50	0.60
D	15.10	15.60	16.10
D1	8.80	9.10	9.40
D2	5.50	-	-
E	9.70	10.00	10.30
E3	7.00	-	-
e	2.54BSC		
e1	5.08BSC		
H1	6.25	6.50	6.85
L	12.75	13.50	13.80
L1	-	3.10	3.40
ΦP	3.40	3.60	3.80
Q	2.60	2.80	3.00