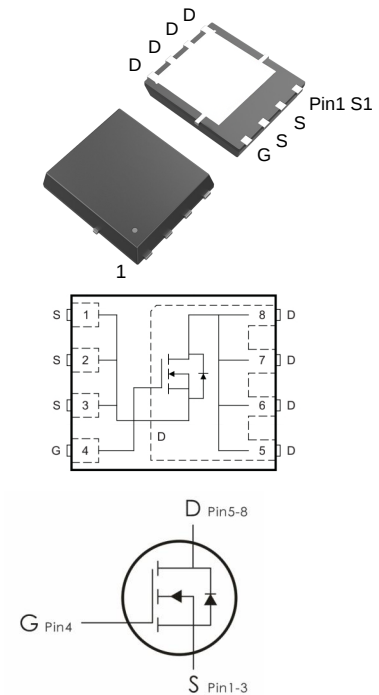


Description:

This N-Channel SiC uses advanced Planar technology and design to provide excellent $R_{DS(on)}$ with low gate charge. It can be used in a wide variety of applications.

Features:

- 1) $V_{DS}=650V, I_D=9A, R_{DS(on)} < 400m\ \Omega @ V_{GS}=18V$ (Typ: $300m\ \Omega$)
- 2) Low gate charge.
- 3) Green device available.
- 4) Advanced high cell density Planar technology for ultra low $R_{DS(on)}$.
- 5) Excellent package for good heat dissipation.



Package Marking and Ordering Information:

Part NO.	Marking	Package	Packing
N0C400N65G3A	C400N65G3A	DFN5*6-8	5000 pcs/Reel

Absolute Maximum Ratings: ($T_C=25\ ^\circ C$ unless otherwise noted)

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	650	V
V_{GS}	Gate-Source Voltage	-10/+22	V
V_{GSOP}	Recommended Operation Value	0/+15	
I_D	Continuous Drain Current ¹	9	A
	Continuous Drain Current- $T_C=100\ ^\circ C$ ¹	6.3	
I_{DM}	Pulsed Drain Current ²	18	
E_{AS}	Single pulse avalanche energy ³	13.3	mJ
P_D	Power Dissipation	56	W
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55-+175	$^\circ C$

Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case	2.2	$^\circ C/W$

Electrical Characteristics: ($T_C=25^{\circ}\text{C}$ unless otherwise noted)

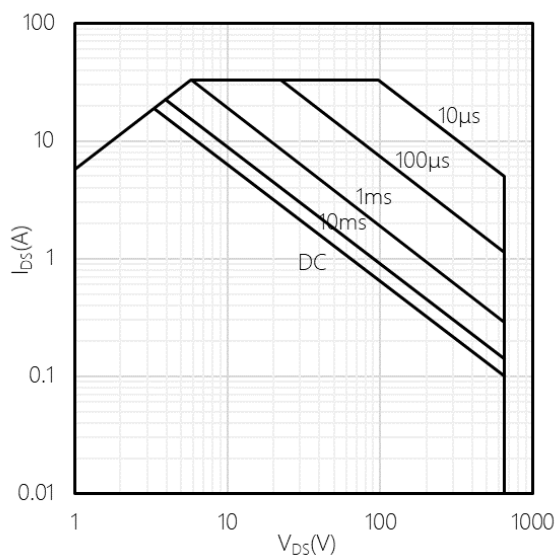
Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =100 μA	650	---	---	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{GS} =0V, V _{DS} =650V	---	---	20	μA
I _{GSS}	Gate-Source Leakage Current	V _{GS} =-10/+22V, V _{DS} =0A	---	---	±250	nA
On Characteristics						
V _{GS(th)}	Gate-Source Threshold Voltage	V _{GS} =V _{DS} , I _D =250 μA	3	3.8	4.5	V
R _{DS(on)}	Drain-Source On Resistance ⁴	V _{GS} =18V, I _D =4.5A	---	300	400	mΩ
		V _{GS} =15V, I _D =4.5A	---	400	520	mΩ
g _{fs}	Transconductance	V _{DS} =20V, I _D =4.5A	---	2.9	---	S
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =400V, V _{GS} =0V, f=1MHz	---	170	---	pF
C _{oss}	Output Capacitance		---	13.6	--	
C _{rss}	Reverse Transfer Capacitance		---	1.3	---	
Switching Characteristics						
t _{d(on)}	Turn-On Delay Time	V _{DS} =400V, I _D =4.5A, R _{ENG} =9.1Ω, V _{GS} =0/15V	---	17.3	---	ns
t _r	Rise Time		---	12.8	---	ns
t _{d(off)}	Turn-Off Delay Time		---	15.2	---	ns
t _f	Fall Time		---	13.7	---	ns
E _{on}	Turn-on Switching Energy		---	47.6	---	μJ
E _{off}	Turn-off Switching Energy		---	3.9	---	μJ
E _{tot}	Total Switching Energy		---	51.6	---	μJ
Q _g	Total Gate Charge	V _{GS} =0/15V, V _{DS} =400V, I _D =4.5A	---	9	---	nC
Q _{gs}	Gate-Source Charge		---	3.4	---	nC
Q _{gd}	Gate-Drain “Miller” Charge		---	1.3	---	nC
R _G	Internal Gate Resistance	f=1MHz, V _{AC} =25mV	---	25	---	Ω

Drain-Source Diode Characteristics						
V_{SD}	Diode Forward Voltage	V _{GS} =0V, I _{SD} =2.5A	---	3.8	---	V
I_S	Continuous Drain Current	V _D =V _G =0V	---	---	6.3	A
I_{SM}	Pulsed Drain Current		---	---	12.6	A
T_{rr}	Reverse Recovery Time	I _{SD} =4.5A, V _{DD} =400A	---	9.4	---	ns
Q_{rr}	Reverse Recovery Charge	dI/dt=1100A/us, Includes	---	23	---	nC
T_{rmm}	Peak Reverse Recovery Current	Q _{loss}	---	4.1	---	A

Notes:

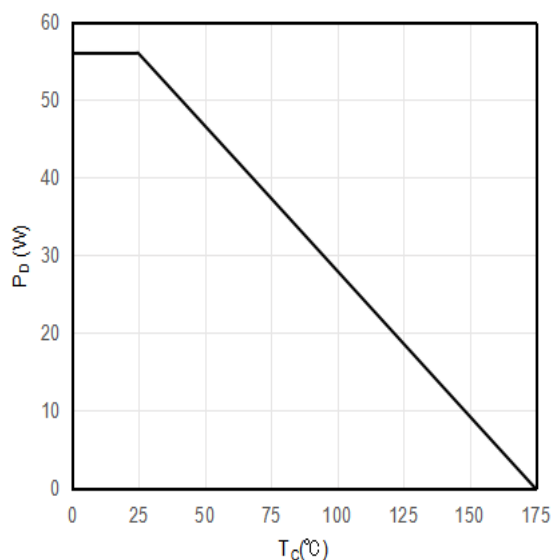
1. Computed continuous current assumes the condition of T_{j,Max} while the actual continuous current depends on the thermal & electro-mechanical application board design
2. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
3. EAS condition : T_J=25°C, V_{DD}=325V, V_G=18V, L=0.5mH
4. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

Typical Characteristics: (T_C=25 °C unless otherwise noted)



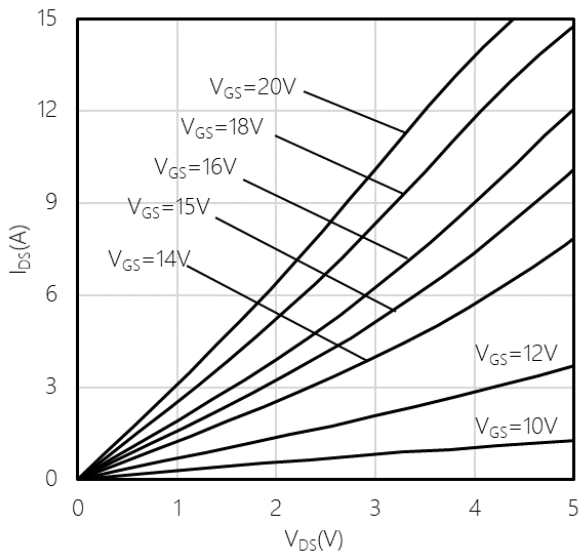
Safe operating area (SOA)

$R_{th(j-c)} = 3.97 \text{ }^{\circ}\text{C/W}$, Single Pulse, T_{vj} = 25°C



Power dissipation as a function of case temperature limited by bond wire

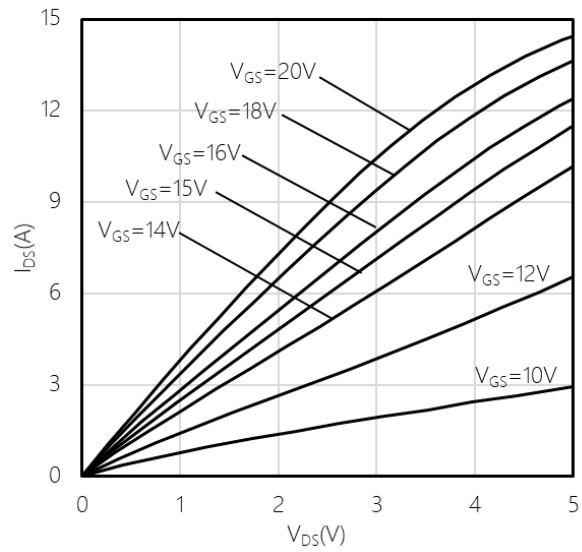
$P_D = f(T_C)$



Typical output characteristic, V_{GS} as parameter

$$I_{DS} = f(V_{DS})$$

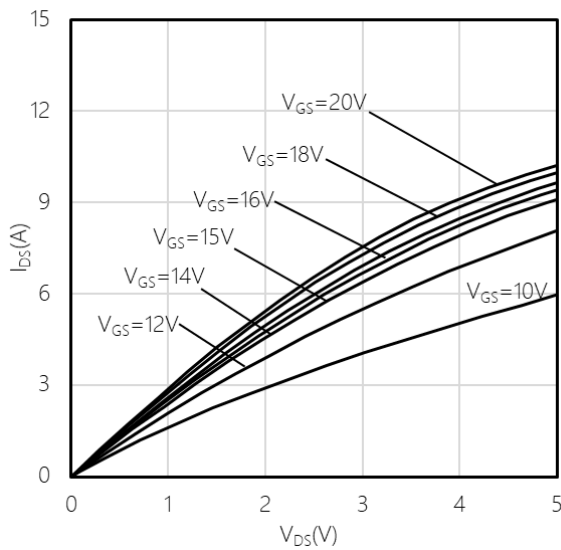
$T_{VJ} = -55\text{ }^{\circ}\text{C}$



Typical output characteristic, V_{GS} as parameter

$$I_{DS} = f(V_{DS})$$

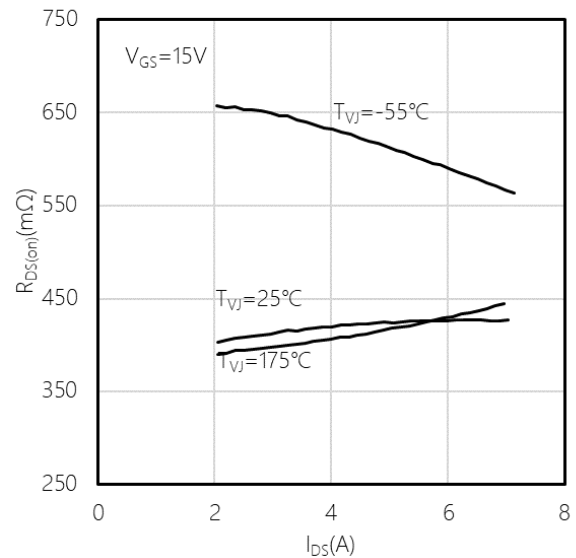
$T_{VJ} = 25\text{ }^{\circ}\text{C}$



Typical output characteristic, V_{GS} as parameter

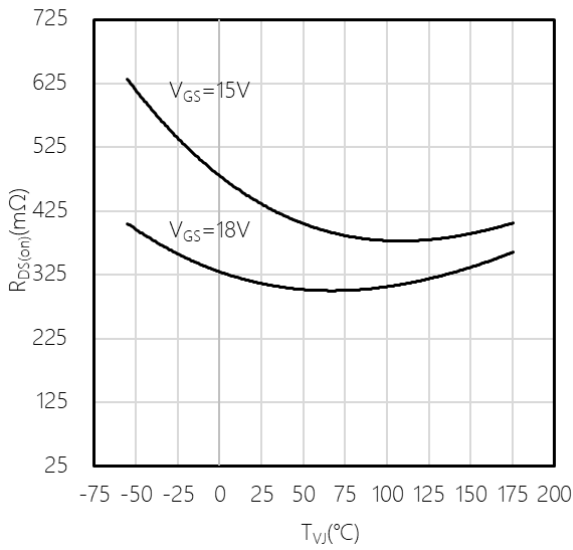
$$I_{DS} = f(V_{DS})$$

$T_{VJ} = 175\text{ }^{\circ}\text{C}$



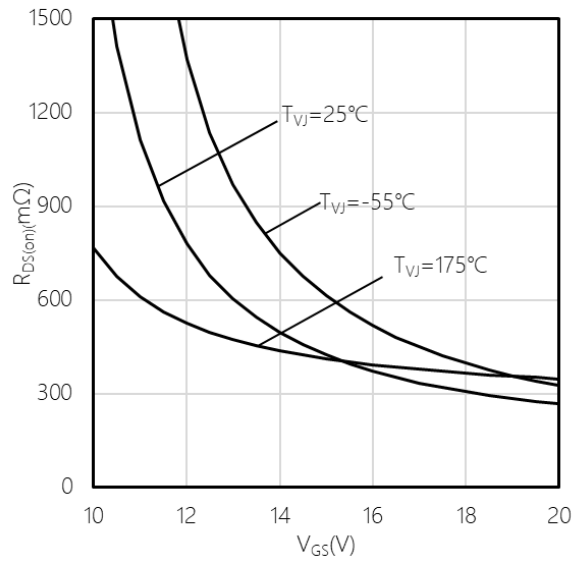
Typical on-state resistance as a function of drain current

$$R_{DS(on)} = f(I_{DS}), V_{GS} = 15V$$



Typical on-state resistance as a function of temperature

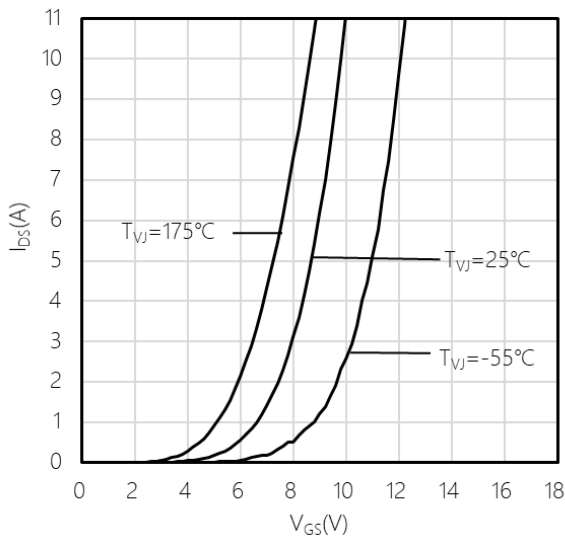
$$R_{DS(on)} = f(T_{VJ}), I_{DS} = 4.5 \text{ A}$$



Typical on-state resistance as a function of V_{GS}

$$R_{DS(on)} = f(V_{GS})$$

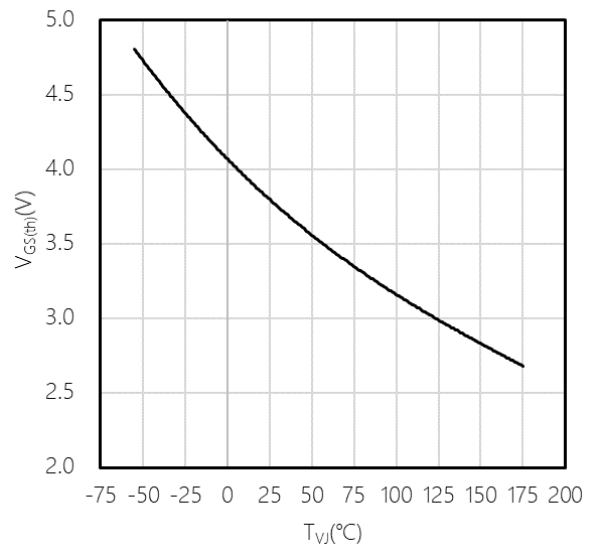
$$I_{DS} = 4.5 \text{ A}$$



Typical transfer characteristic

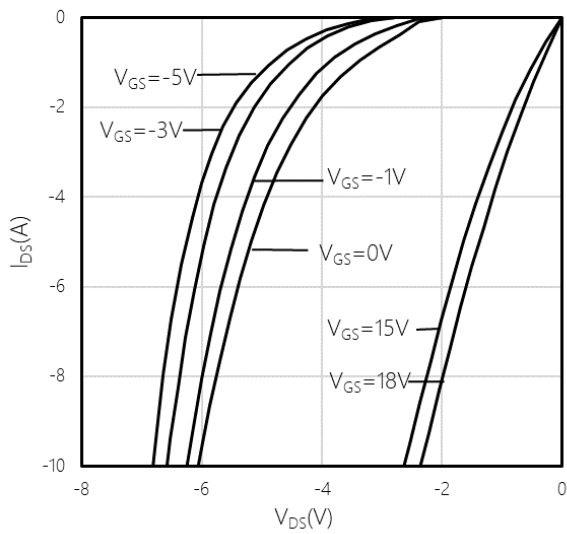
$$I_{DS} = f(V_{GS})$$

$$V_{DS} = 20 \text{ V}$$



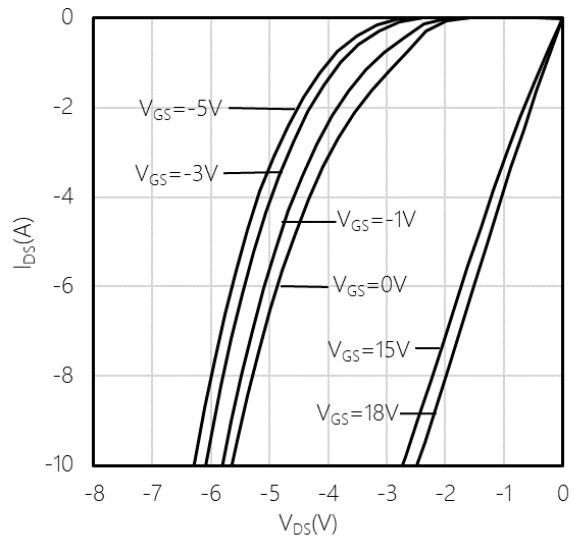
Typical gate-source threshold voltage as a function of junction temperature

$$V_{GS(th)} = f(T_{VJ}), I_{DS} = 3.5 \text{ mA}$$



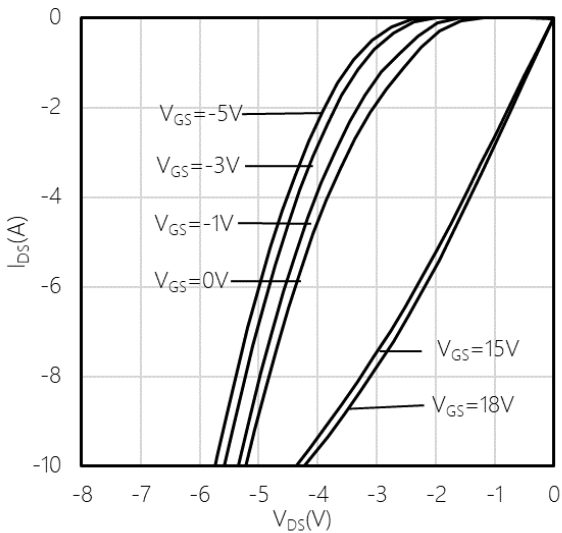
Typical reverse drain current as function of reverse drain voltage, V_{GS} as parameter

$$I_{DS} = f(V_{DS}), T_{VJ} = -55\text{ }^{\circ}\text{C}$$



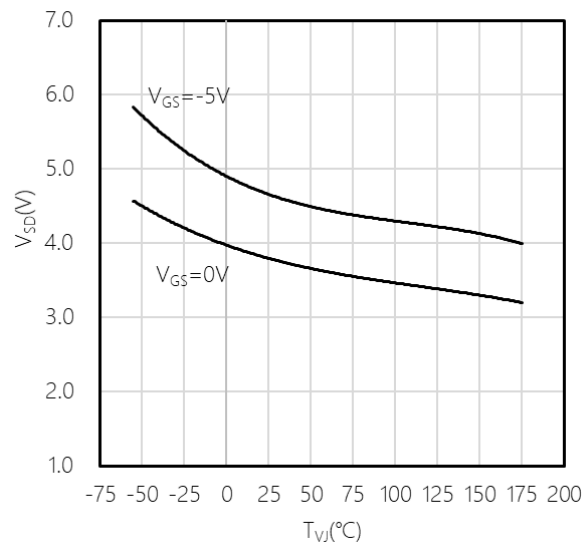
Typical reverse drain current as function of reverse drain voltage, V_{GS} as parameter

$$I_{DS} = f(V_{DS}), T_{VJ} = 25\text{ }^{\circ}\text{C}$$



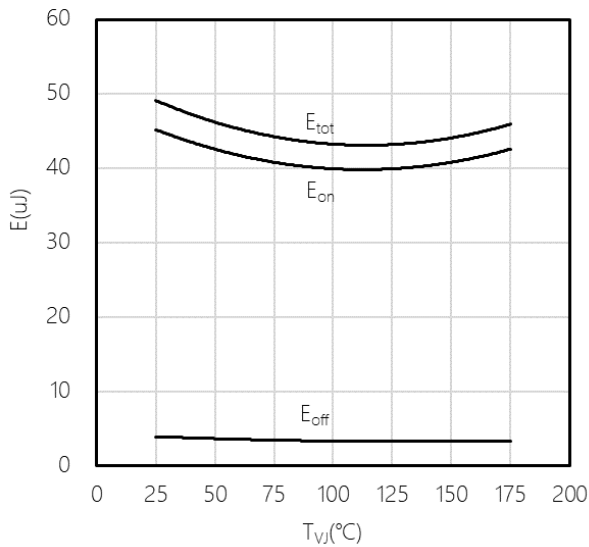
Typical reverse drain current as function of reverse drain voltage, V_{GS} as parameter

$$I_{DS} = f(V_{DS}), T_{VJ} = 175\text{ }^{\circ}\text{C}$$



Typical reverse drain voltage as function of junction temperature

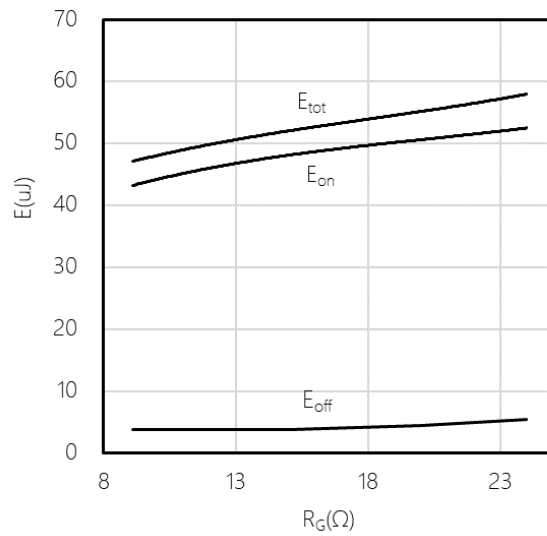
$$V_{SD} = f(T_{VJ}), I_{SD} = 2.5\text{ A}$$



Typical switching energy as a function of junction temperature, 2nd device own body diode: $V_{GS} = 0\text{ V}$

$$E = f(T_{vj})$$

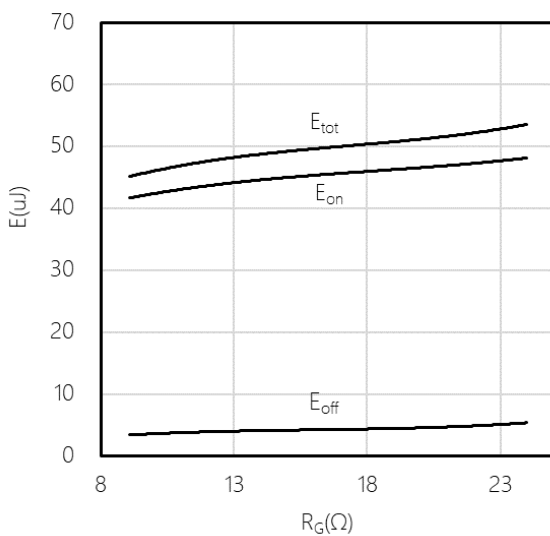
$V_{DS} = 400\text{ V}$, $R_{G(ext)} = 9.1\ \Omega$, $V_{GS} = 0\text{ V} / 15\text{ V}$, $I_{DS} = 4.5\text{ A}$



Typical switching energy losses as a function of gate resistance, 2nd device own body diode: $V_{GS} = 0\text{ V}$

$$E = f(R_{G(ext)})$$

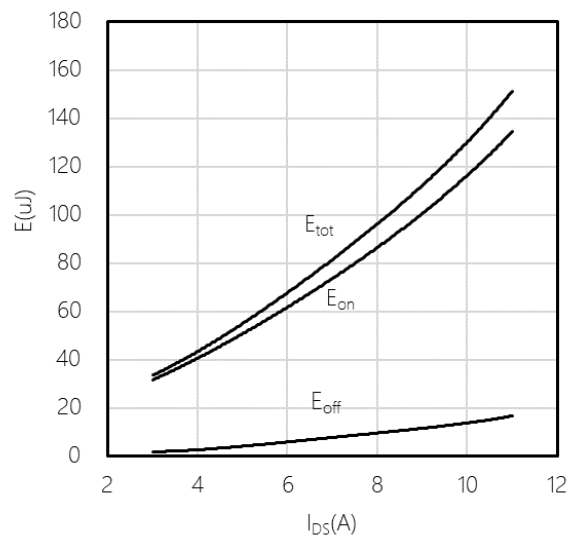
$V_{GS} = 0/15\text{ V}$, $I_{DS} = 4.5\text{ A}$, $T_{vj} = 25\text{ °C}$, $V_{DS} = 400\text{ V}$



Typical switching energy losses as a function of gate resistance, 2nd device own body diode: $V_{GS} = 0\text{ V}$

$$E = f(R_{G(ext)})$$

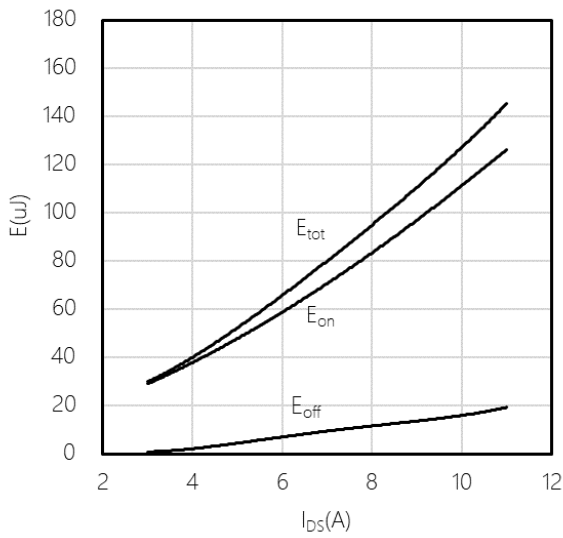
$V_{GS} = 0/15\text{ V}$, $I_{DS} = 4.5\text{ A}$, $T_{vj} = 175\text{ °C}$, $V_{DS} = 400\text{ V}$



Typical switching energy losses as a function of I_{DS} , 2nd device own body diode: $V_{GS} = 0\text{ V}$

$$E = f(I_{DS})$$

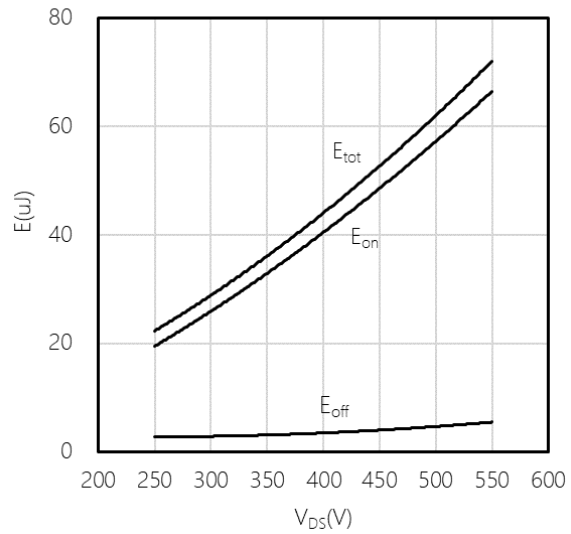
$V_{GS} = 0/15\text{ V}$, $R_{G(ext)} = 9.1\ \Omega$, $T_{vj} = 25\text{ °C}$, $V_{DS} = 400\text{ V}$



Typical switching energy losses as a function of I_{DS} , 2nd device own body diode: $V_{GS} = 0\text{ V}$

$$E = f(I_{DS})$$

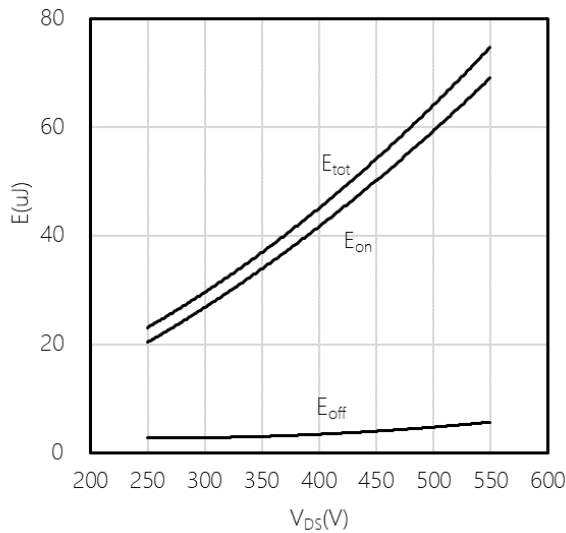
$V_{GS} = 0/15\text{ V}$, $R_{G(ext)} = 9.1\ \Omega$, $T_{VJ} = 175\ ^\circ\text{C}$, $V_{DS} = 400\text{ V}$



Typical switching energy losses as a function of V_{DS} , 2nd device own body diode: $V_{GS} = 0\text{ V}$

$$E = f(V_{DS})$$

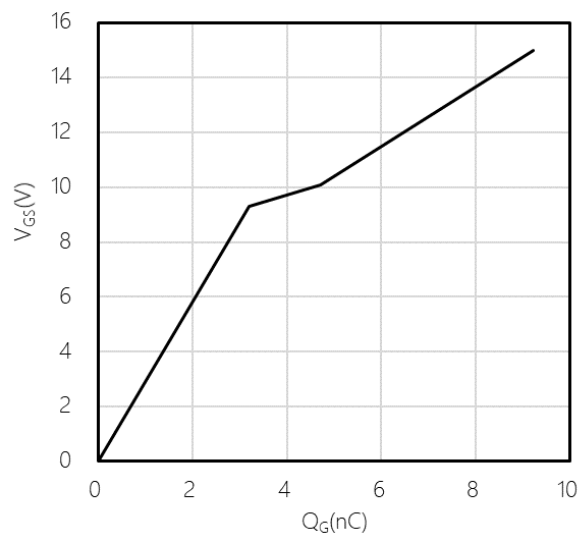
$V_{GS} = 0/15\text{ V}$, $R_{G(ext)} = 9.1\ \Omega$, $T_{VJ} = 25\ ^\circ\text{C}$, $I_{DS} = 4.5\text{ A}$



Typical switching energy losses as a function of V_{DS} , 2nd device own body diode: $V_{GS} = 0\text{ V}$

$$E = f(V_{DS})$$

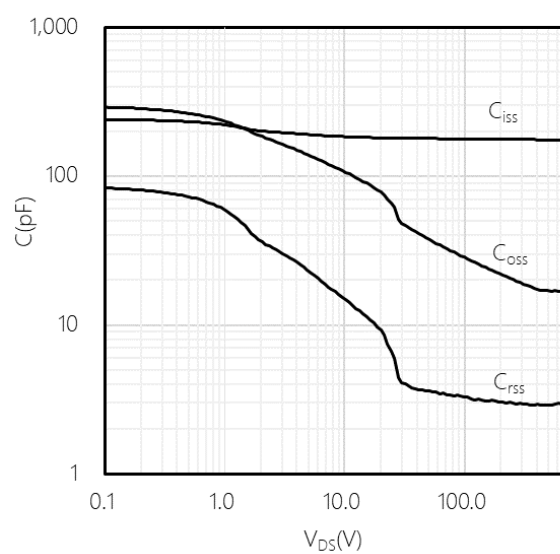
$V_{GS} = 0/15\text{ V}$, $R_{G(ext)} = 9.1\ \Omega$, $T_{VJ} = 175\ ^\circ\text{C}$, $I_{DS} = 4.5\text{ A}$



Typical gate charge

$V_{GS} = f(Q_G)$, $I_{DS} = 4.5\text{ A}$, $V_{DS} = 400\text{ V}$

turn-on pulse

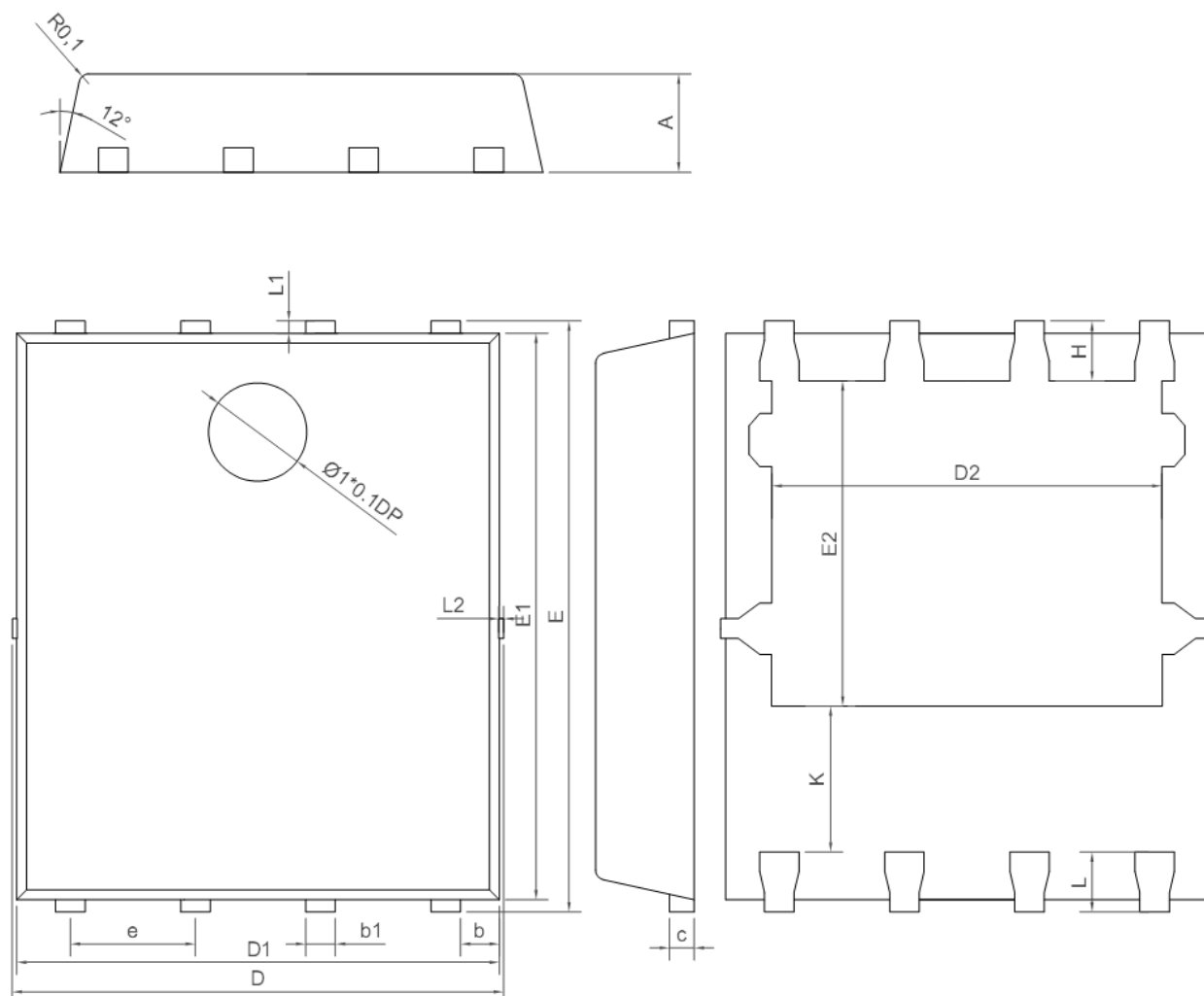


Typical capacitance as a function of drain-source voltage

$C = f(V_{DS}), V_{GS} = 0V, f = 1MHz$

DFN5X6-8 Package Information:

UNIT: mm

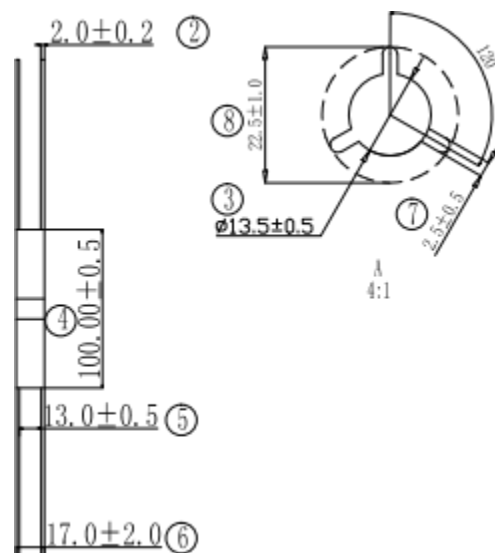
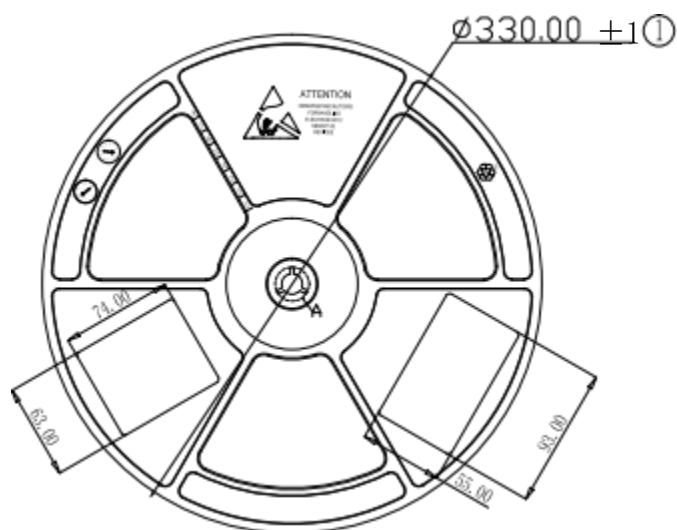


Dimensions

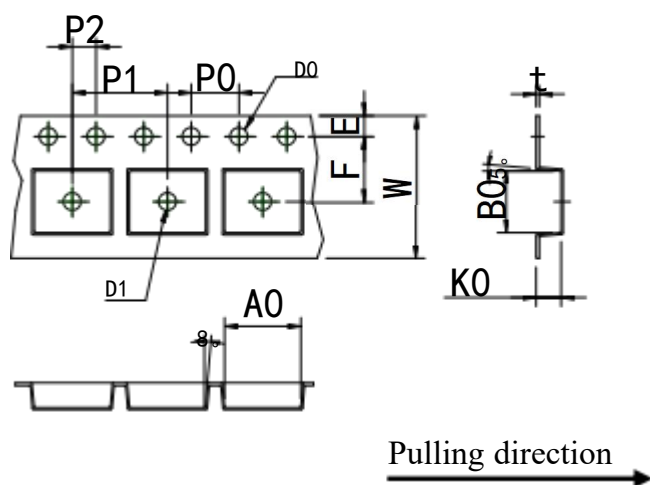
Unit	A	b	b1	c	D	D1	D2	e	E	E1	E2	H	K	L	L1	L2
mm	0.90 (1.00) 1.10	0.35 (0.40) 0.45	0.25 (0.30) 0.35	0.21 (0.25) 0.34	4.90 (5.00) 5.10	4.80 (4.90) 5.00	3.82 (3.96) 4.11	1.17 (1.27) 1.37	5.90 (6.00) 6.10	5.70 (5.75) 5.80	3.18 (3.30) 3.54	0.51 (0.61) 0.71	1.10 -- --	0.51 (0.61) 0.71	0.07 (0.12) 0.20	-- -- 0.10

Tape & Reel Information

Dimensions in mm



Symbol	A0	B0	K0	D0	D1	P0	P1	10*P0
Spec	6.15 ± 0.10	5.40 ± 0.10	1.30 ± 0.10	1.55 ± 0.10	1.55 ± 0.10	4.00 ± 0.10	8.00 ± 0.10	40.00 ± 0.10
Symbol	W	E	F	P2	t			
Spec	12.00 ± 0.10	1.75 ± 0.10	5.50 ± 0.10	2.00 ± 0.10	0.20 ± 0.05			



Marking Information:

①. Doingter LOGO

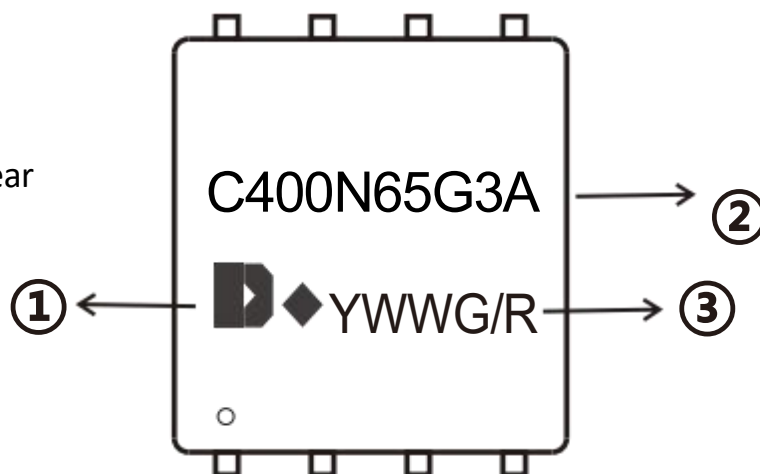
②. Part NO.

③. Date Code(YWWG / R)

Y : Year Code , last digit of the year

WW : Week Code(01-53)

G/R : G(Green) /R(Lead Free)



Previous Version

Version	Date	Subjects (major changes since last revision)
1.0	2026-04-19	Release of final version

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