

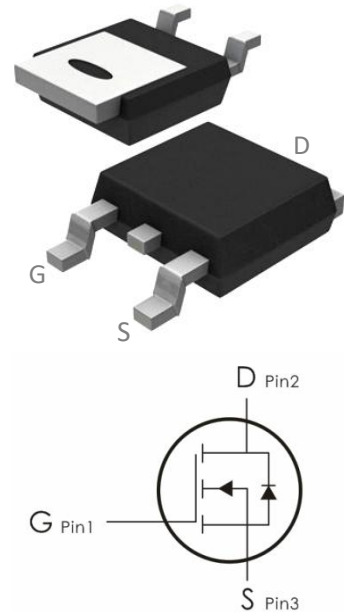
Description:

This N-Channel MOSFET uses advanced trench 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) $V_{DS}=30V, I_D=30A, R_{DS(on)} < 12m\Omega @ V_{GS}=10V$
- 2) Low gate charge.
- 3) Green device available.
- 4) Advanced high cell density trench technology for ultra low $R_{DS(on)}$.
- 5) Excellent package for good heat dissipation.



Absolute Maximum Ratings: ($T_A=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Continuous Drain Current- $T_C=25^\circ\text{C}$	30	A
I_{DM}	Pulse Drain Current Tested①	120	A
P_D	Power Dissipation- $T_C=25^\circ\text{C}$	52	W
E_{AS}	Single pulse avalanche energy ②	43	mJ
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +175	$^\circ\text{C}$

Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case	2.4	$^\circ\text{C/W}$

Package Marking and Ordering Information:

Part NO.	Marking	Package
DC010NG-S	C010N-S	TO-252

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

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV _{DSS}	Drain-Sourtce Breakdown Voltage	V _{GS} =0V, I _D =250 μ A	30	---	---	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =30V, V _{GS} =0V, T _A =25℃	---	---	1	μ A
		V _{DS} =24V, V _{GS} =0V, T _A =125℃	---	---	100	nA
I _{GSS}	Gate-Source Leakage Current	V _{GS} =± 20V, V _{DS} =0A	---	---	± 100	nA
On Characteristics						
V _{GS(th)}	GATE-Source Threshold Voltage	V _{GS} =V _{DS} , I _D =250 μ A	1	1.6	2.5	V
R _{DS(ON)}	Drain-Source On Resistance③	V _{GS} =10V, I _D =20A	---	8.8	12	m Ω
		V _{GS} =7V, I _D =20A	---	10	15	m Ω
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =15V, V _{GS} =0V, f=1MHz	---	1050	---	pF
C _{oss}	Output Capacitance		---	120	---	
C _{rss}	Reverse Transfer Capacitance		---	90	---	
R _G	Gate Resistance	f=1MHz	---	9	---	Ω
Switching Characteristics						
t _{d(on)}	Turn-On Delay Time	V _{DD} =15V, I _D =15A R _{GEN} =3.3Ω, V _{GS} =10V	---	3.4	---	ns
t _r	Rise Time		---	5.8	---	ns
t _{d(off)}	Turn-Off Delay Time		---	21	---	ns
t _f	Fall Time		---	4.6	---	ns
Q _g	Total Gate Charge	V _{GS} =10V, V _{DS} =15V, I _D =20A	---	6.9	---	nC
Q _{gs}	Gate-Source Charge		---	0.9	---	nC
Q _{gd}	Gate-Drain “Miller” Charge		---	1.8	---	nC
Drain-Source Diode Characteristics						

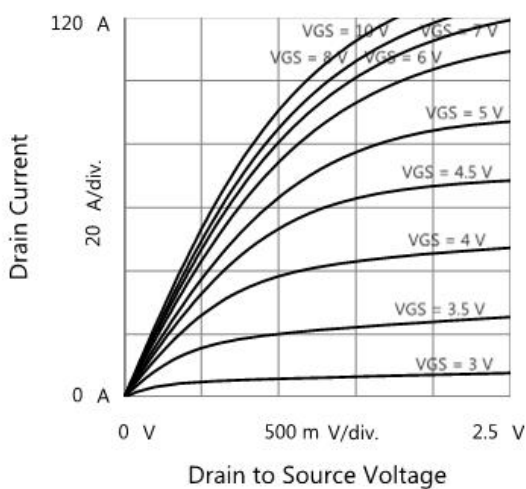
I_S	Continuous Source Current	---	---	---	2	A
V_{SD}	Diode Forward Voltage③	V _{GS} =0V, I _S =2A, T _J =25°C	---	0.85	1.2	V

Notes:

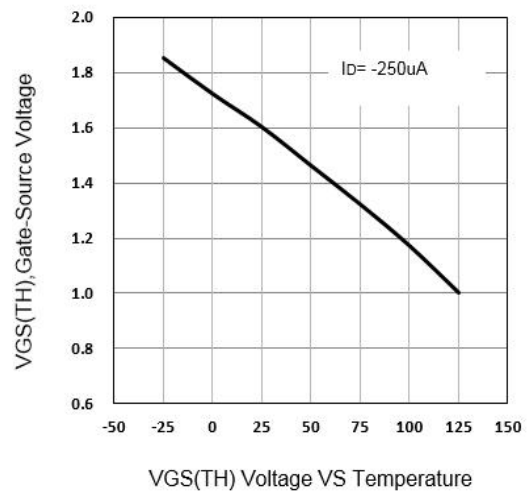
- ① Pulse width limited by maximum allowable junction temperature
- ② Limited by T_{Jmax}, starting T_J = 25°C, L = 0.3mH, R_G = 25Ω, I_{AS} = 8A, V_{GS} = 10V. Part not recommended for use above this value
- ③ Pulse width ≤ 300μs; duty cycle ≤ 2%

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

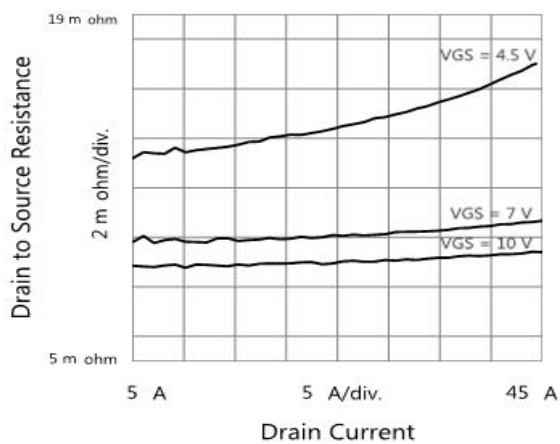
Output Characteristics



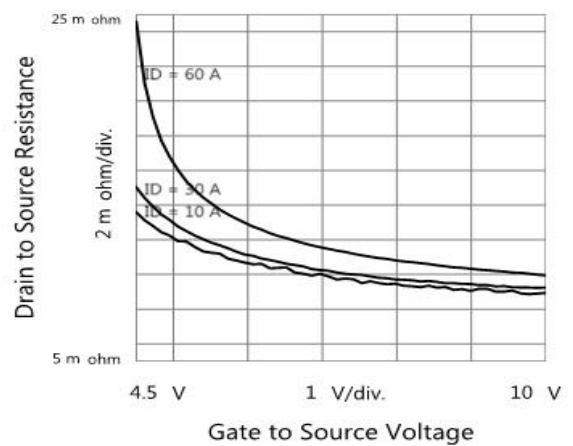
T_J-Junction Temperature



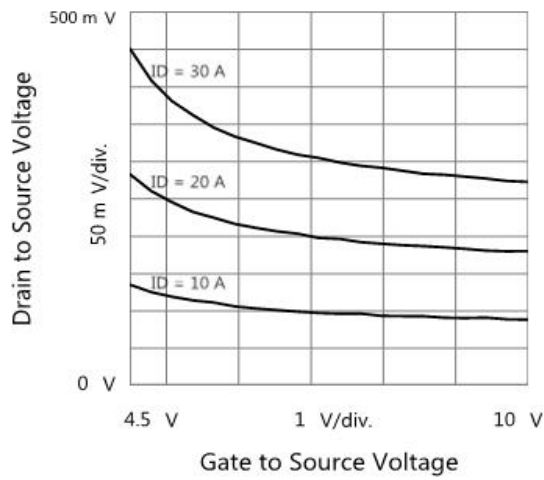
Drain to Source Resistance vs. Drain Current



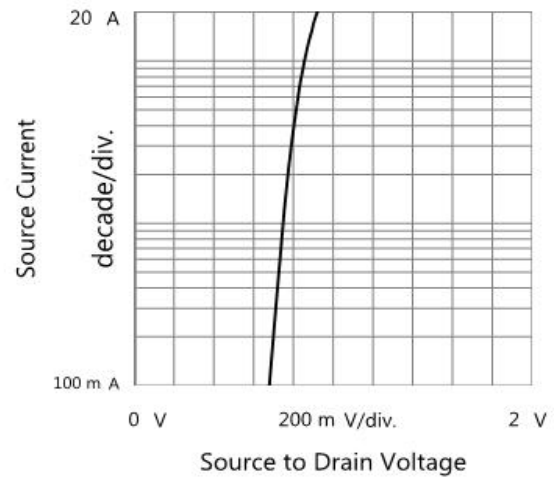
Drain to Source Resistance vs. Gate to Source Voltage



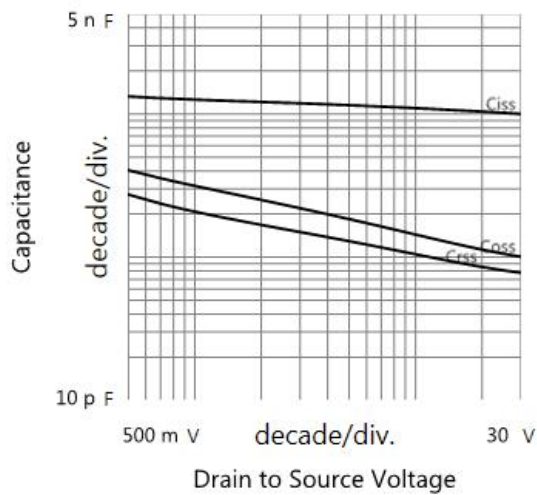
Drain to Source Voltage vs. Gate to Source Voltage



Body Diode Forward Characteristics



Capacitances



Gate Charge

