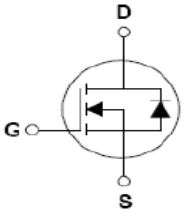
Silicon N-Channel Power MOSFET

CDA20N60

TO-3P(N)
Plastic Package

PIN CONFIGURATION
1. GATE
2. DRAIN
3. SOURCE



DESCRIPTION	VALUE	UNIT
V_{DSS}	600	V
I_D	20	A
$P_D(T_C=25°C)$	250	W

Features

1) Fast Switching
2) Low ON Resistance(R_{dson}≤0.34Ω)
3) Low Gate Charge (Typical Data: 54nC)
4) Low Reverse transfer capacitances(Typical: 14.5pF)
5) 100% Single Pulse avalanche energy Test

Applications

Power switch circuit of adaptor and charger

Description

CDA20N60, the silicon N-channel Enhanced VDMOSFET, is obtained by the self-aligned planar Technology which reduce the conduction loss, improve switching performance and enhance the avalanche energy. The transistor can be used in various power switching circuit for system miniaturization and higher efficiency The package form is TO-3P(N), which accords with the RoHS standard

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

DESCRIPTION	SYMBOL	VALUE	UNIT
Drain-to-Source Voltage	V_{DSS}	600	V
Continuous Drain Current	I_D	20	A
Continuous Drain Current T_C=100 °C		14	A
Pulsed Drain Current	I_{DM} [a1]	80	A
Gate-to-Source Voltage	V_{GS}	±30	V
Single Pulse Avalanche Energy	E_{As} [a2]	550	mJ
Avalanche Energy ,Repetitive	E_{Ar} [a1]	50	mJ
Avalanche Current	I_{AR} [a1]	4.5	A
Peak Diode Recovery dv/dt	dv/dt [a3]	5.0	V/ns
Power Dissipation	P_D	250	W
Derating Factor above 25°C		2.0	W/°C
Operating Junction and Storage Temperature Ran	T_J, T_{stg}	150°C , –55 to 150	°C
MaximumTemperature for Soldering	T_L	300	°C

Caution: Stresses greater than those in the “Absolute Maximum Ratings” may cause permanent damage to the device

Thermal Characteristic

DESCRIPTION	SYMBOL	VALUE	UNIT
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.5	°C/W
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	40	°C/W

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

DESCRIPTION	SYMBOL	Test Conditions	VALUE			Unit
			Min	Typ	Max	
Off Characteristics						
Drain to Source Breakdown Voltage	V_{DSS}	V_{GS}=0V,I_D=250μA	600	--	--	V
Bvdss Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	I_D=250uA,Reference25°C	--	0.65	--	V/°C
Drain to Source Leakage Current	I_{DSS}	V_{DS}=600V, V_{GS}=0V,T_a=25°C	--	--	1	μA
		V_{DS}=480V, V_{GS}=0V,T_a=125°C	--	--	100	
Gate to Source Forward Leakage	$I_{GSS(F)}$	V_{GS}=+30V	--	--	100	nA
Gate to Source Reverse Leakage	$I_{GSS(R)}$	V_{GS}=-30V	--	--	-100	nA
ON Characteristics						
Drain-to-Source On-Resistance	$R_{DS(ON}$	V_{GS}=10V,I_D=10A	--	0.3	0.34	Ω
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}=V_{GS},I_D=250μA	2	--	4	V
Forward Trans conductance	g_{fs}	V_{DS}=15V,I_D=10A	--	17	--	S
Note: Pulse width<380μs; duty cycle<2%.						
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{GS}=0V V_{DS}=25V, f=1.0MHz	--	2800	--	pF
Output Capacitance	C_{oss}		--	233	--	
Reverse Transfer Capacitance	C_{rss}		--	14.5	--	
Resistive Switching Characteristics						
Turn-on Delay Time	$t_{d(ON)}$	I_D=20A,V_{DD}=300V, Rg=25Ω	--	36	--	ns
Rise Time	t_r		--	73	--	
Turn-Off Delay Time	$t_{d(OFF)}$		--	166	--	
Fall Time	t_f		--	73	--	
Total Gate Charge	Q_g	I_D=20A,V_{DD}=300V, VGS=10V	--	54	--	nC
Gate to Source Charge	Q_{gs}		--	16	--	
Gate to Drain (“Miller”)Charge	Q_{gd}		--	10	--	
Source-Drain Diode Characteristics						
Continuous Source Current (Body Diode)	I_{SD}		--	--	20	A
Maximum Pulsed Current (Body Diode)	I_{SM}		--	--	80	A
Diode Forward Voltage	V_{SD}	I_S=12A,V_{GS}=0V	--	--	1.5	V
Reverse Recovery Time	t_{rr}	I_S=12A,T_j=25°C	--	595	--	ns
Reverse Recovery Charge	Q_{rr}	dI_F/dt=100A/μs,V_{GS}=0V	--	2.9	--	uC

Notes:

a1. Repetitive rating; pulse width limited by maximum junction temperature

a2. L=10mH, I_D=15.5A, Start T_J=25°C

a3. I_{SD}=20A,di/dt ≤100A/us,V_{DD}≤BV_{DS}, Start T_J=25°C

Characteristics Curves

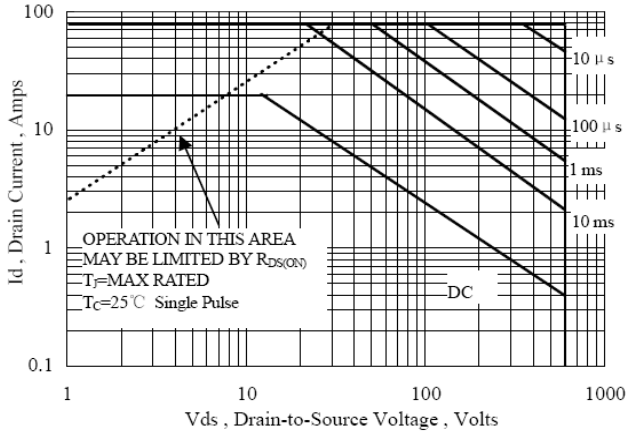


Figure 1 Maximum Forward Bias Safe Operating Area

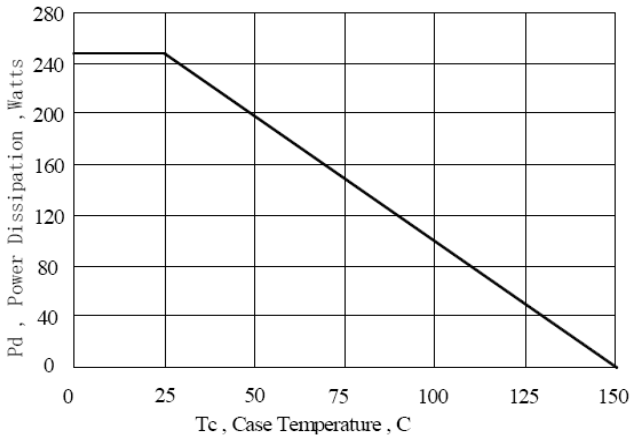


Figure 2 Maximum Power Dissipation vs Case Temperature

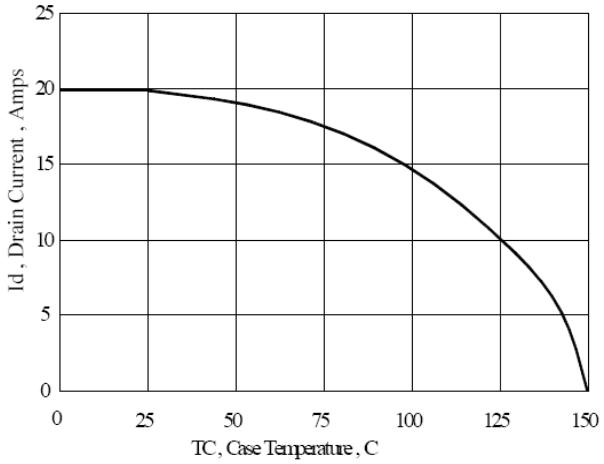


Figure 3 Maximum Continuous Drain Current vs Case Temperature

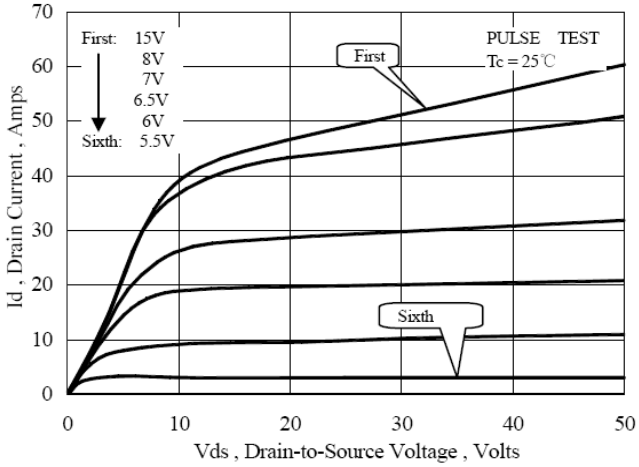


Figure 4 Typical Output Characteristics

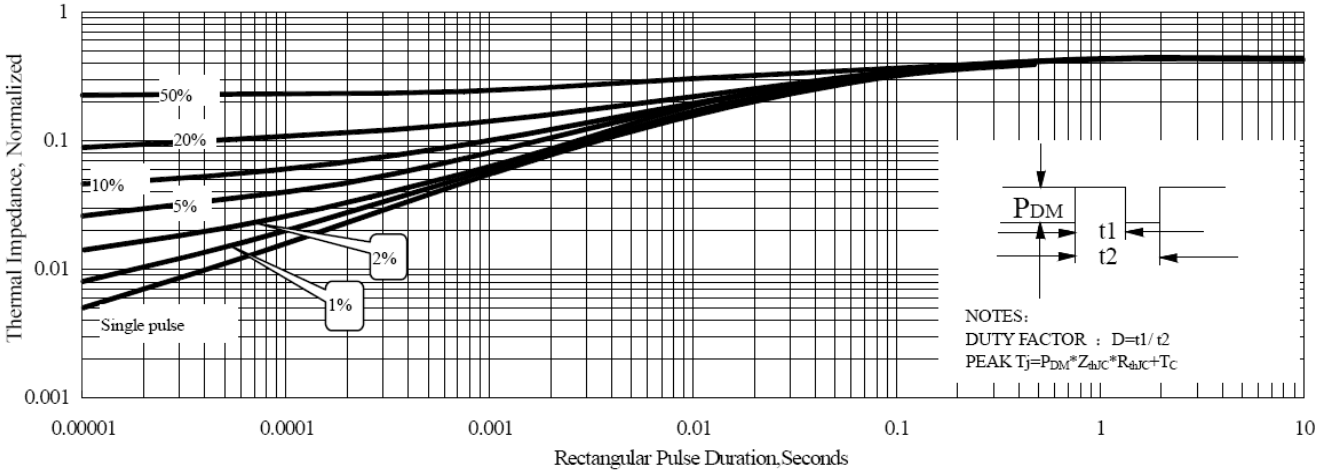


Figure 5 Maximum Effective Thermal Impendance , Junction to Case

Characteristics Curves (cont…..)

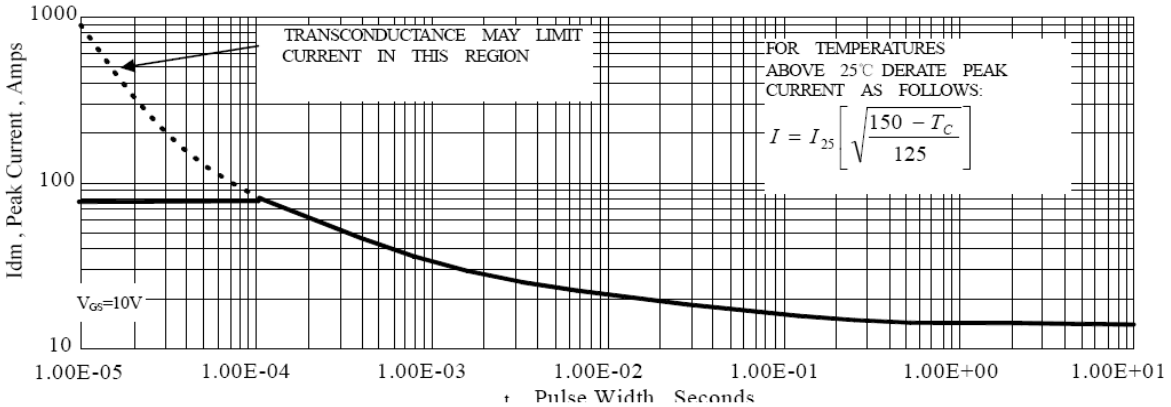


Figure 6 Maximum Peak Current Capability

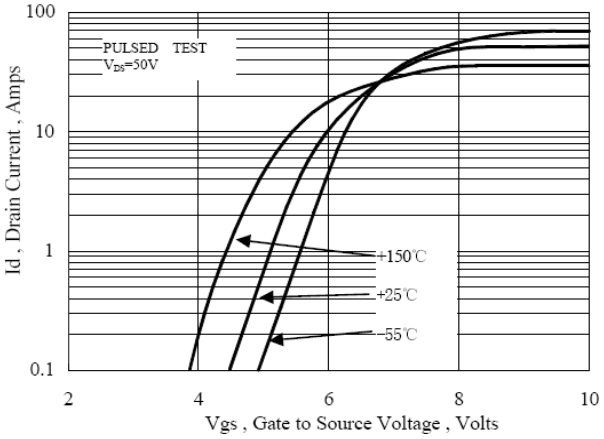


Figure 7 Typical Transfer Characteristics

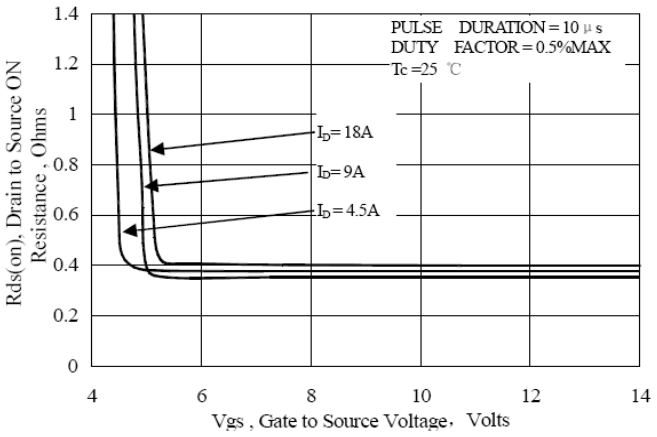


Figure 8 Typical Drain to Source ON Resistance vs Gate Voltage and Drain Current

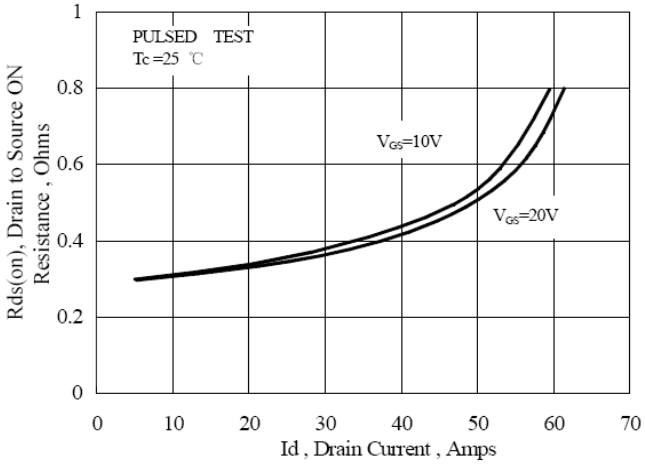


Figure 9 Typical Drain to Source ON Resistance vs Drain Current

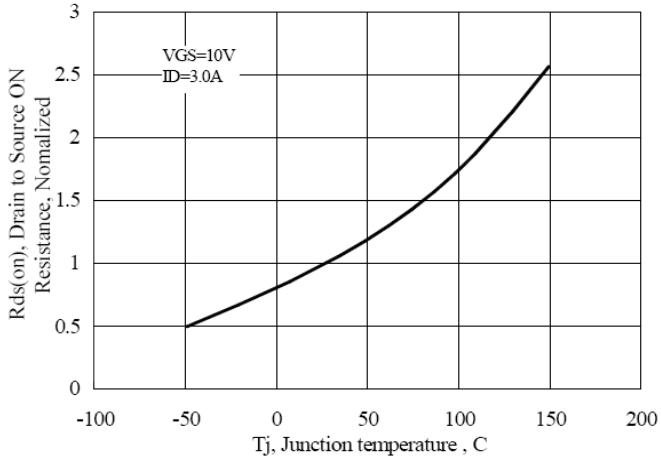


Figure 10 Typical Drian to Source on Resistance vs Junction Temperature

Characteristics Curves (cont…..)

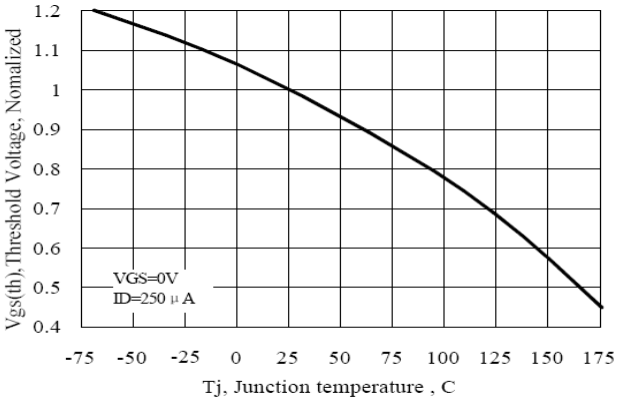


Figure 11 Typical Theshold Voltage vs Junction Temperature

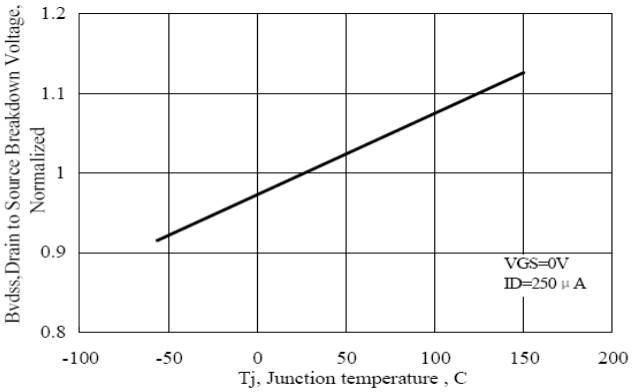


Figure 12 Typical Breakdown Voltage vs Junction Temperature

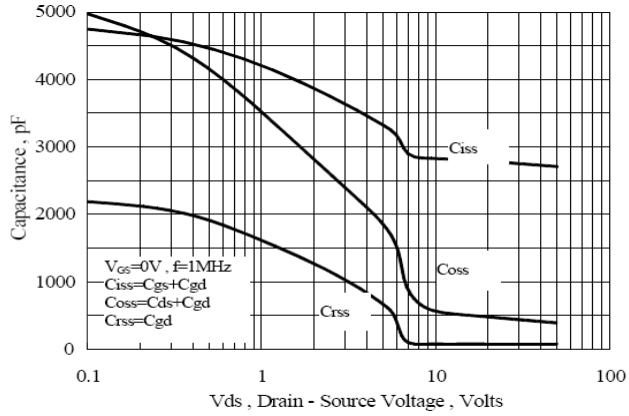


Figure 13 Typical Capacitance vs Drain to Source Voltage

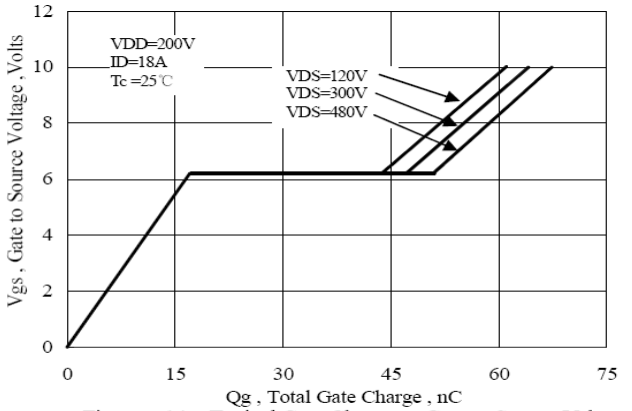


Figure 14 Typical Gate Charge vs Gate to Source Voltage

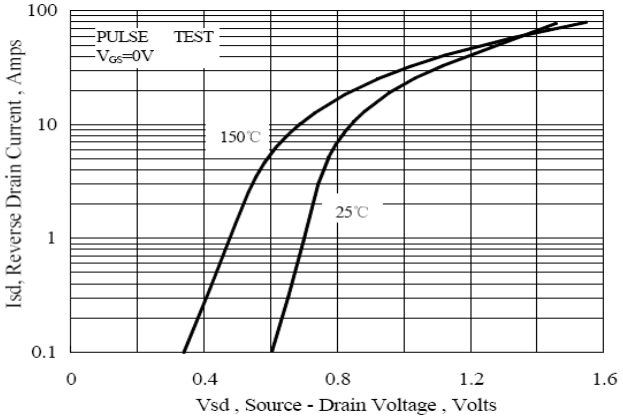


Figure 15 Typical Body Diode Transfer Characteristics

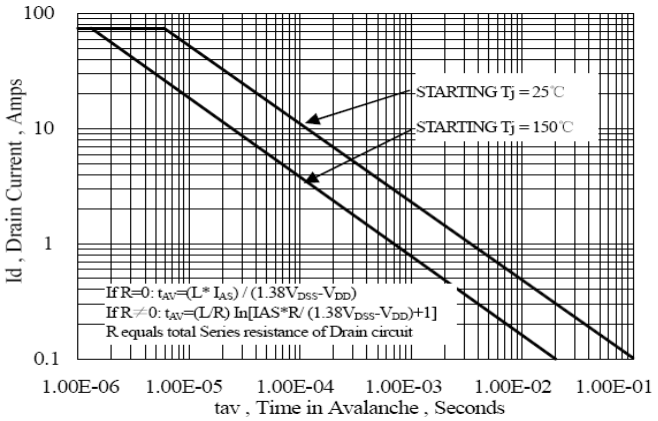


Figure 16 Unclamped Inductive Switching Capability

Customer Notes

Component Disposal Instructions

1. CDIL Semiconductor Devices are RoHS compliant, customers are requested to please dispose as per prevailing Environmental Legislation of their Country.

2. In Europe, please dispose as per EU Directive 2002/96/EC on Waste Electrical and Electronic Equipment (WEEE).

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