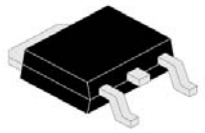
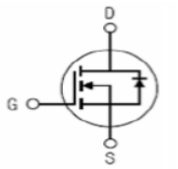
N-Channel Power MOSFET

CDD20N03



TO-252 (DPAK)

Inner Equivalent Principium Chart



TO-252 (DPAK)

SMD Plastic Package

Features

1. $R_{DS(ON)}$ <35mΩ @ VGS=10V
2. High density cell design for ultra low R_{dson}
3. Fully characterized avalanche voltage and current
4. Excellent package for good heat dissipation

Applications

1. Power switching application
2. Hard switched and high frequency circuits
3. Uninterruptible power supply

Description

The CDD20N03 uses advanced trench technology and design to provide excellent RDS(ON) with low gate charge. It can be used in a wide variety of applications. The package form is TO-252, which accords with the RoHS standard.

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

DESCRIPTION	SYMBOL	VALUE	UNIT
Drain-Source voltage	V_{DSS}	30	V
Gate-Source voltage	V_{GS}	±12	V
Drain Current-Continuous	I_D	20	A
Pulsed Drain Current [1]	I_{DM}	80	A
Maximum Power Dissipation	P_D	32.5	W
Operating Junction and Storage Temperature Range	T_J,T_{STG}	150, -55 to +150	°C

Thermal Characteristic

DESCRIPTION	SYMBOL	VALUE	UNIT
Thermal Resistance, Junction-to-Case [2]	$R_{\theta JC}$	3.846	°C/W

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

DESCRIPTION	SYMBOL	Test Conditions	VALUE			Unit
			Min	Typ	Max	
Off Characteristics						
Drain-Source Breakdown Voltage	V_{DSS}	V_{GS} = 0V, I_D = 250μA	30	-	-	V
Drain to Source Leakage Current (25°C)	I_{DSS}	V_{DS} = 30, V_{GS} = 0V			1.0	μA
Gate to Source Forward Leakage	$I_{GSS(F)}$	V_{GS} = +12V,			0.1	μA
Gate to Source Reverse Leakage	$I_{GSS(R)}$	V_{GS} = -12V,			-0.1	μA
On Characteristics 3)						
Gate-Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	0.7		2.5	V
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS} = 10V, I_D = 10A			35	mΩ
Forward Trans conductance	g_{fs}	V_{DS} = 15V, I_D = 2A		3		S
Pulse width tp≤380μs,δ≤2%						
Dynamic Characteristics 4)						
Input Capacitance	C_{iss}	V_{GS} = 0V V_{DS} = 50V, f=1.0 MHz		247		pF
Output Capacitance	C_{oss}			34		
Reverse Transfer Capacitance	C_{rss}			19.5		
Rssistive Switching Characteristics 4)						
Turn-On Delay Time	td(on)	V_{DD} = 15V, I_D = 3A V_{GS} = 10V, R_G = 1Ω,		6		ns
Rise Time	tr			15		
Turn-Off Delay Time	td(off)			15		
Fall Time	tf			10		
Total Gate Charge	Qg	V_{GS} = 4.5V, I_D = 3A, V_{DD}= 15V		6		nC
Gate-Source Charge	Qgs			1		
Gate to Drain (“Miller”)Charge	Qgd			1.3		
Drain-Source Diode Characteristics						
Diode Forward Voltage [3]	V_{SD}	I_S = 20A,V_{GS} = 0V			1.5	V
Continuous Source Current [2](Body Diode)	I_s				20	A

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production

Test Circuit and Electrical Characteristics

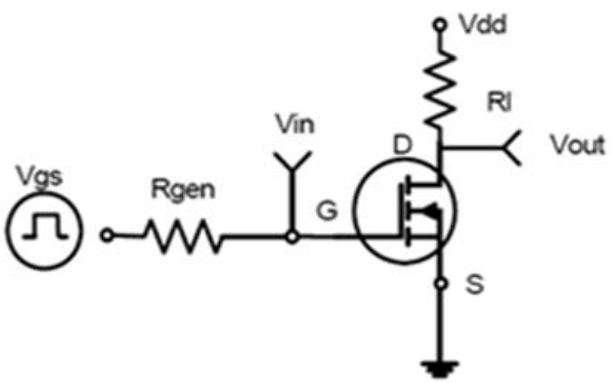


Figure 1:Switching Test Circuit

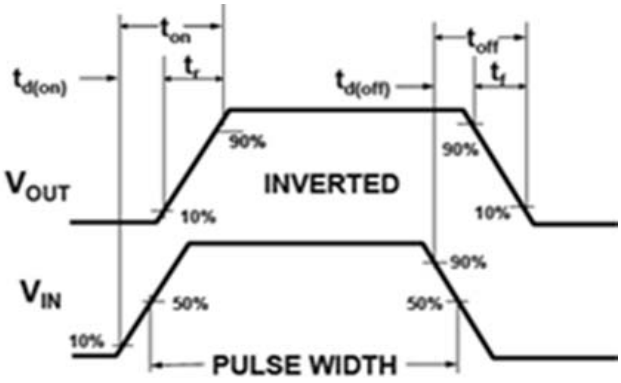


Figure 2:Switching Waveforms

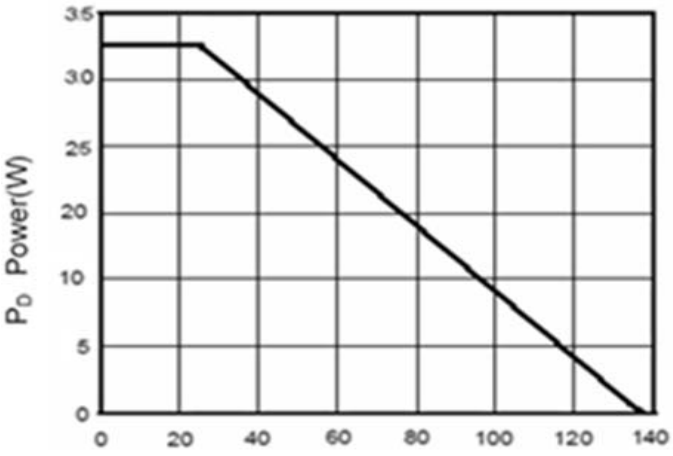


Figure 3 Power Dissipation

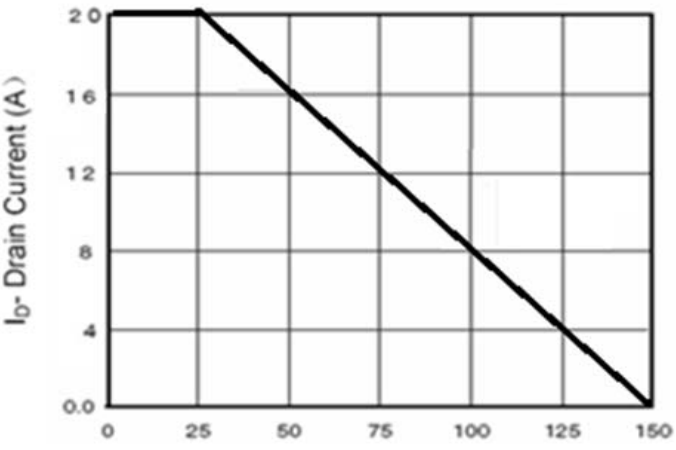


Figure 4 Drain Current

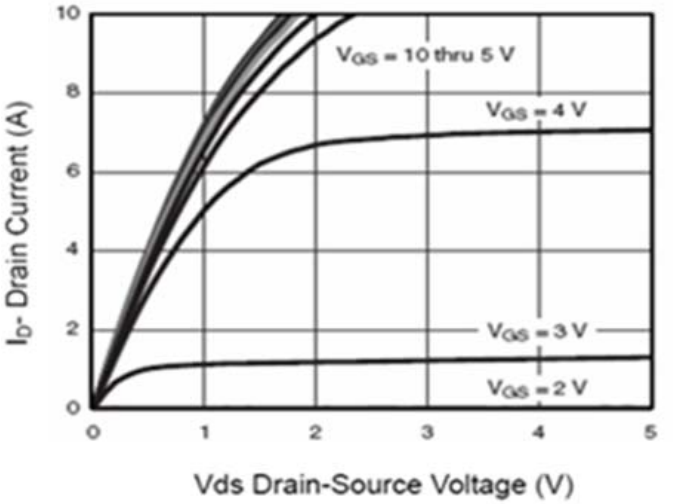


Figure 5 Output Characteristics

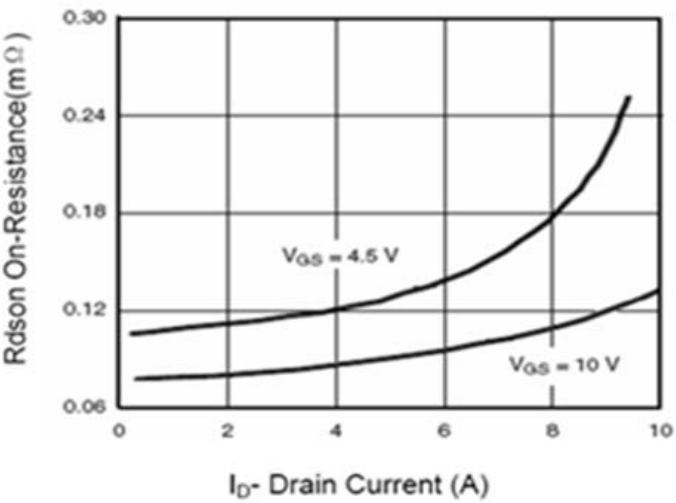


Figure 6 Drain-Source On-Resistance

Typical Electrical And Thermal Characteristics

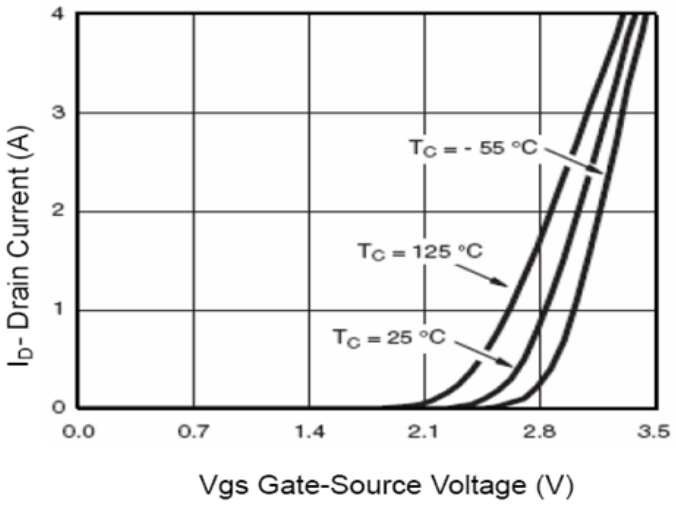


Figure 7 Transfer Characteristics

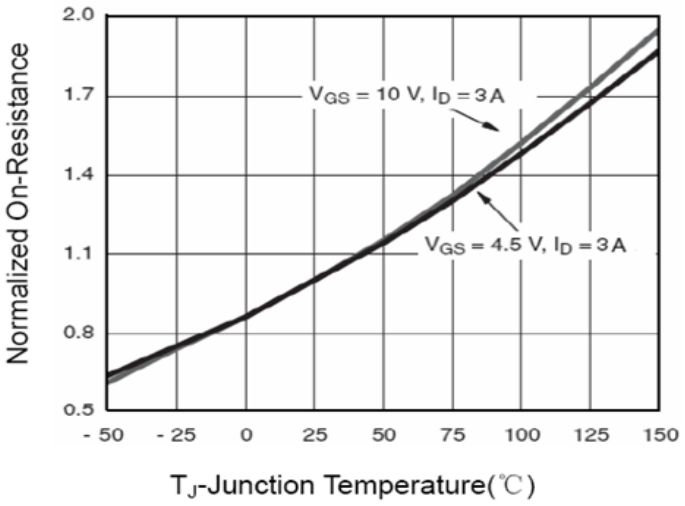


Figure 8 Drain-Source On-Resistance

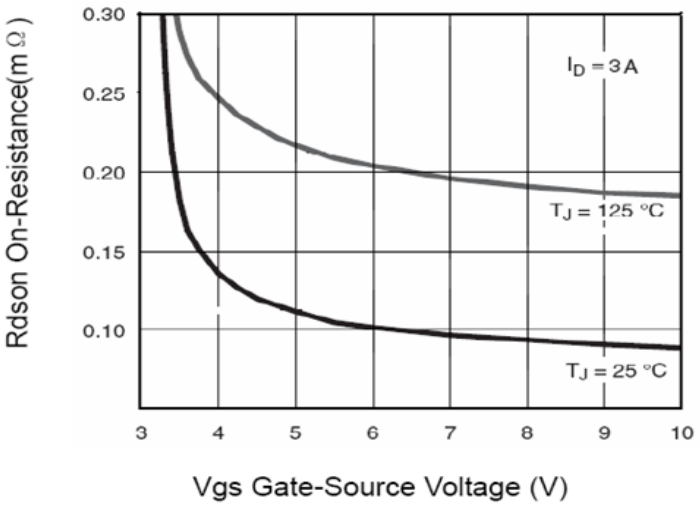


Figure 9 Rdson vs Vgs

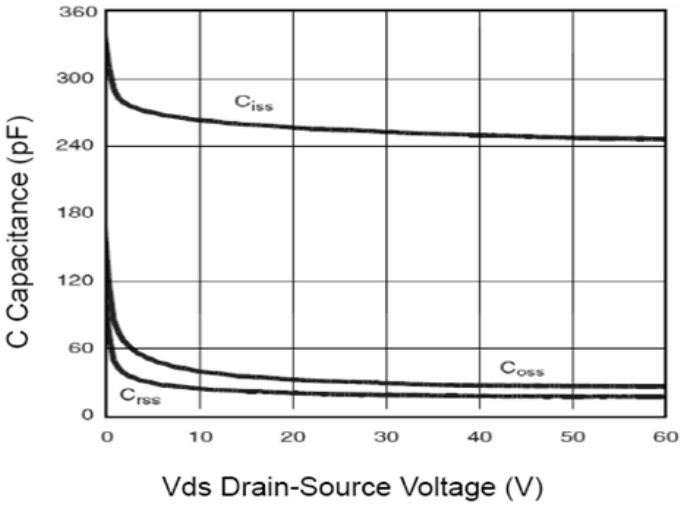


Figure 10 Capacitance vs Vds

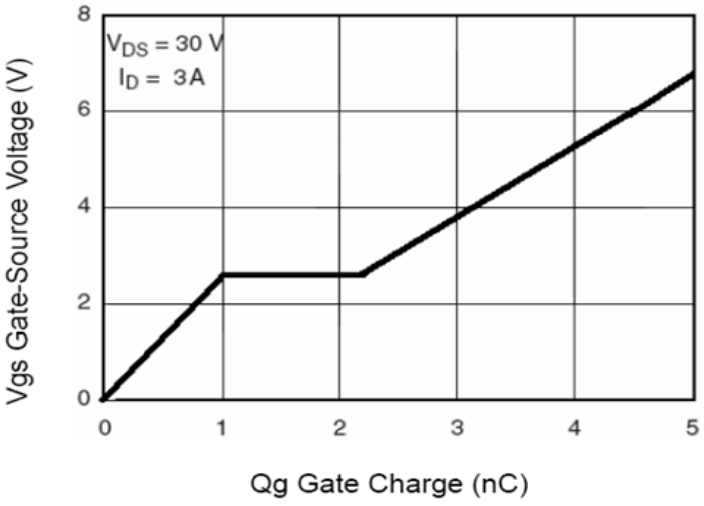


Figure 11 Gate Charge

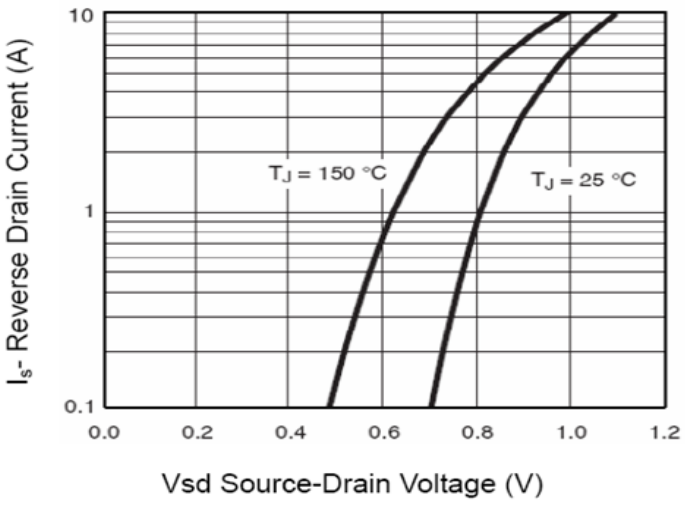
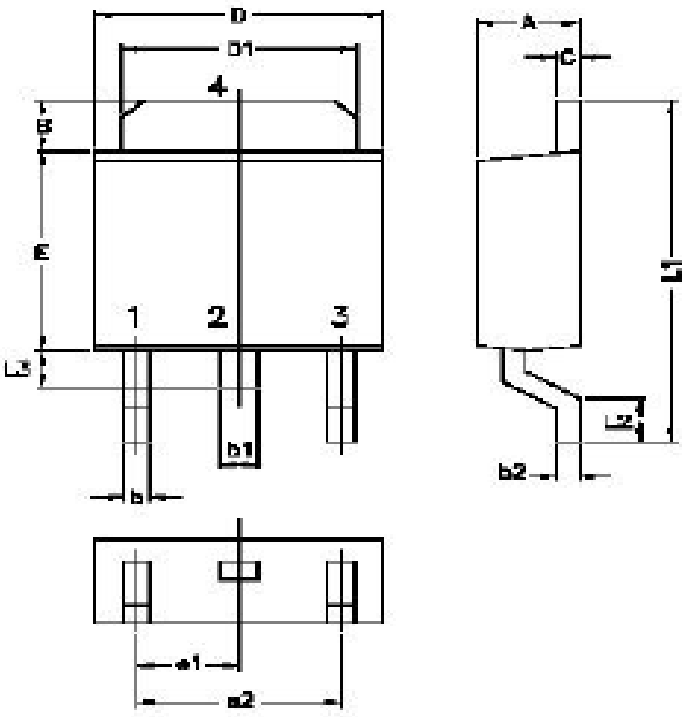
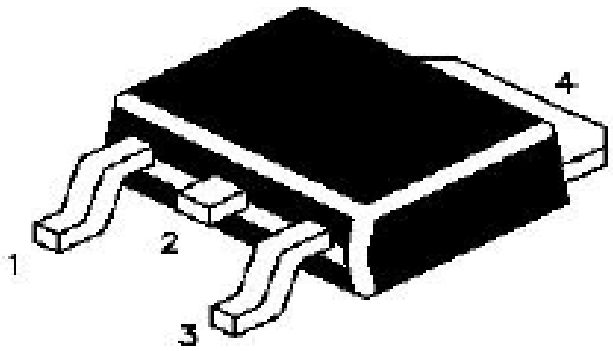


Figure 12 Source- Drain Diode Forward

Package Details



DIM	MIN.	MAX.
A	2.20	2.40
B	1.30	1.50
b	0.55	0.65
b1	0.75	0.85
b2	0.46	0.58
C	0.46	0.58
D	6.40	6.60
D1	5.20	5.40
E	5.40	5.60
e1	2.25	2.35
e2	4.50	4.70
L1	9.25	9.75
L2	0.5	—
L3	0.90	1.10



PIN CONFIGURATION
1. T1 MAIN TERMINAL 1
2. T2 MAIN TERMINAL 2
3. G GATE
4. FIN (T2)

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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