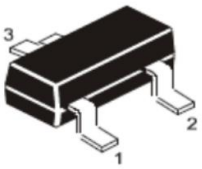
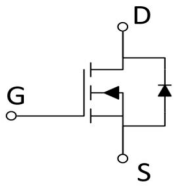
N CHANNEL STANDARD LEVEL FET

CDM213SN
SOT-23
Surface Mounted
Plastic Package



1. GATE
2. SOURCE
3. DRAIN



FEATURES

■ Low on-state resistance in a small surface mount package.

APPLICATIONS

■ DC-to-DC primary side switching.

MARKING CODE : 213

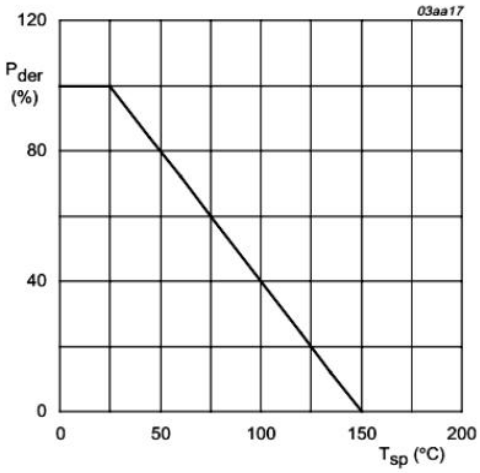
MAXIMUM RATINGS (T_a =25°C unless otherwise specified)

PARAMETER			SYMBOL	VALUE	UNIT
Drain-Source voltage			V_{DS}	100	V
Drain-Gate Voltage			V_{DGR}	100	
Gate-Source voltage			V_{GS}	±30	
Drain Current	V_{GS} at 10 V	T_{sp} = 25 °C	I_D	1.9	A
		T_{sp} = 100 °C		1.2	
Pulsed Drain Current			I_{DM}	7.6	
Total Power Dissipation			P_{tot}	2	W
junction temperature			T_J	-55 to 150	°C
storage temperature			T_{STG}	-55 to 150	°C
SOURCE-DRAIN DIODE					
Source (Diode Forward) Current (DC)			I_S	1.7	A
Peak Source (Diode Forward) Current			I_{SM}	6.9	A

ELECTRICAL CHARACTERISTICS (T_J =25°C unless otherwise specified)

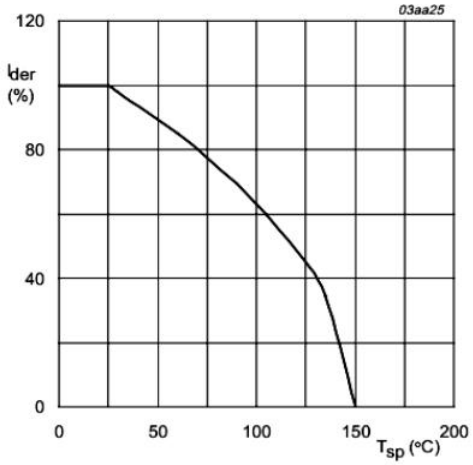
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNITS
STATIC CHARACTERISTICS						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V, I_D=250µA	100			V
		V_{GS}=0V, I_D=250µA, T_j=-55°C	90			
Gate-Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=1mA	1.3	1.8	2.5	V
		V_{DS}=V_{GS}, I_D=1mA, T_j=150°C	1.2			
		V_{DS}=V_{GS}, I_D=1mA, T_j=-55°C			4.4	
Gate-body Leakage current	I_{GSS}	V_{DS}=0V, V_{GS}=±20V		±10	±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=100V, V_{GS}=0V			1	µA
		V_{DS}=100V, V_{GS}=0V, T_J=150°C			100	
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS}=10V, I_D=0.5		213	250	mΩ
		V_{GS}=10V, I_D=0.5, T_J=150°C		490	575	
DYNAMIC CHARACTERISTICS						
Total Gate Charge	$Q_{g(tot)}$	V_{GS}=10V, I_D=1.2A, V_{DS}=80V		7		nC
Gate-Source Charge	Q_{gs}			1.4		
Gate-Drain Charge	Q_{gd}			2.5		
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=20V, f=1.0MHz		330		pF
Output Capacitance	C_{oss}			36		
Reverse Transfer Capacitance	C_{rss}			22		
Turn-On Delay Time	$t_{d(on)}$	V_{DD}= 50V; R_L=33 Ω; V_{GS}=10V; R_G = 6Ω		5.5		ns
Rise Time	t_r			5		
Turn-Off Delay Time	$t_{d(off)}$			9.5		
Fall Time	t_f			3		
SOURCE-DRAIN DIODE						
Diode Forward Voltage	V_{SD}	I_S = 1.5A, V_{GS} = 0V		0.83	1.2	V
Body Diode Reverse Recovery Time	t_{rr}	I_s=1.2A, dI/dt =-100A/µs, V_{GS}=0V		36		ns
Body Diode Reverse Recovery Charge	Q_{rr}			23		nC

CHARACTERISTIC CURVES



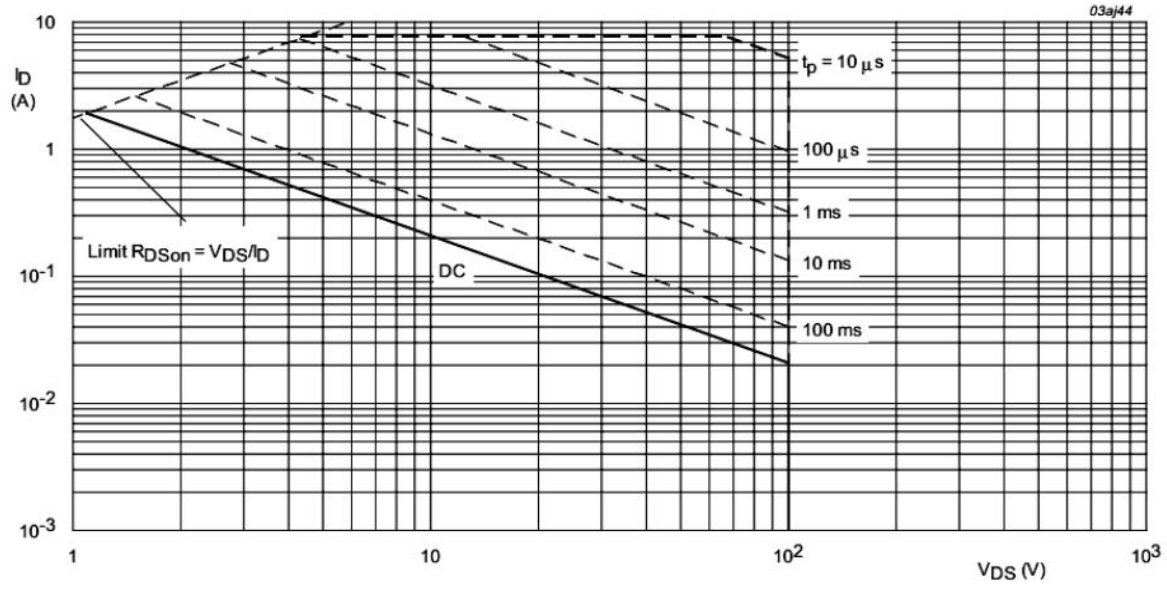
$$P_{der} = \frac{P_{tot}}{P_{tot(25^{\circ}C)}} \times 100\%$$

Fig 1. Normalized total power dissipation as a function of solder point temperature.



$$I_{der} = \frac{I_D}{I_{D(25^{\circ}C)}} \times 100\%$$

Fig 2. Normalized continuous drain current as a function of solder point temperature.



T_{sp} = 25 °C; I_{DM} is single pulse; V_{GS} = 10V

Fig 3. Safe operating area; continuous and peak drain currents as a function of drain-source voltage.

CHARACTERISTIC CURVES (Cont..)

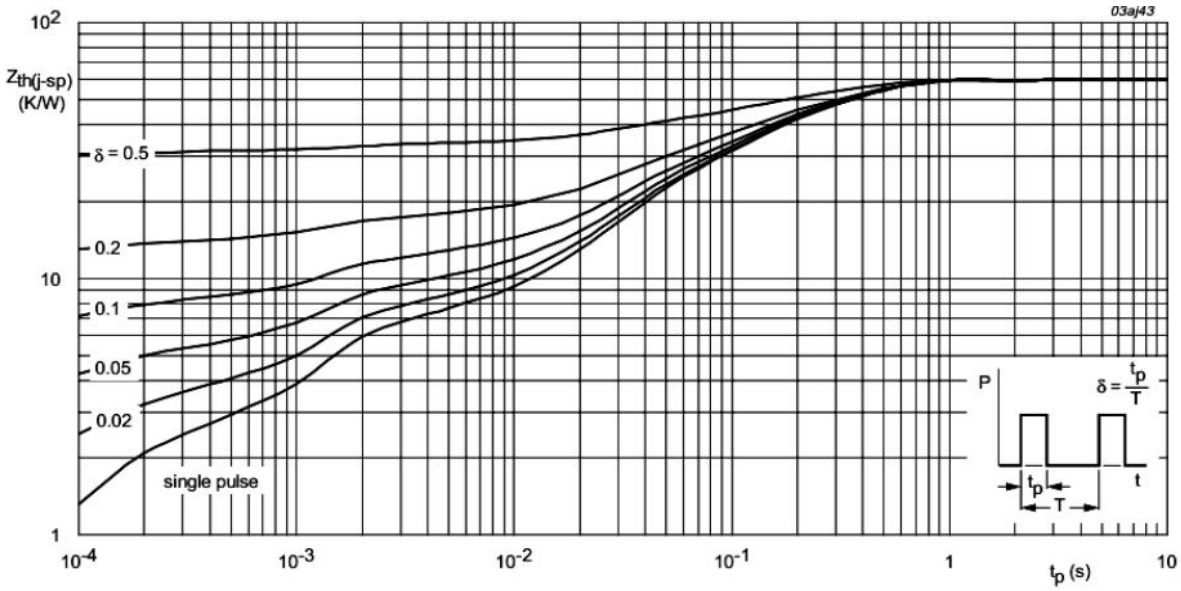
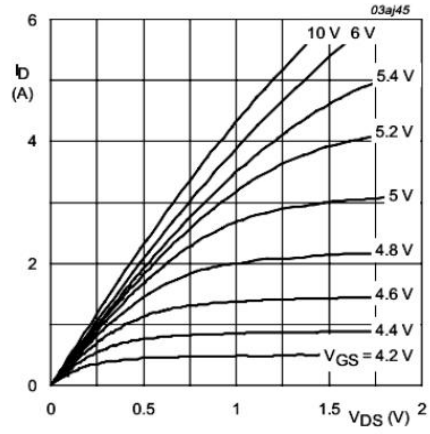
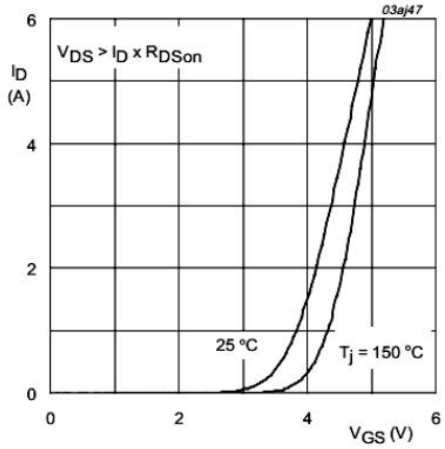


Fig 4. Transient thermal impedance from junction to solder point as a function of pulse duration.



T_j = 25 °C

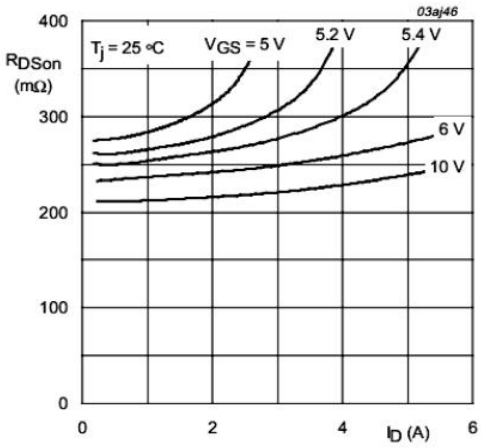
Fig 5. Output characteristics: drain current as a function of drain-source voltage; typical values.



T_j = 25 °C and 150 °C; $V_{DS} > I_D \times R_{DSon}$

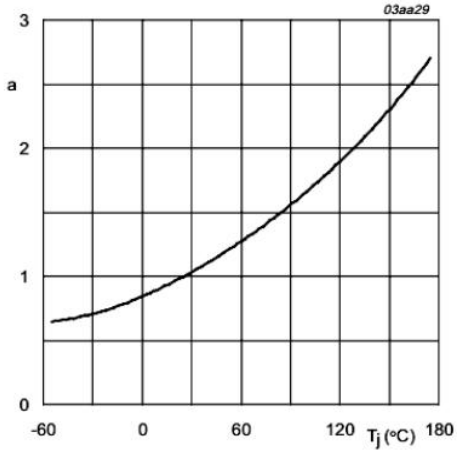
Fig 6. Transfer characteristics: drain current as a function of gate-source voltage; typical values.

CHARACTERISTIC CURVES (Cont..)



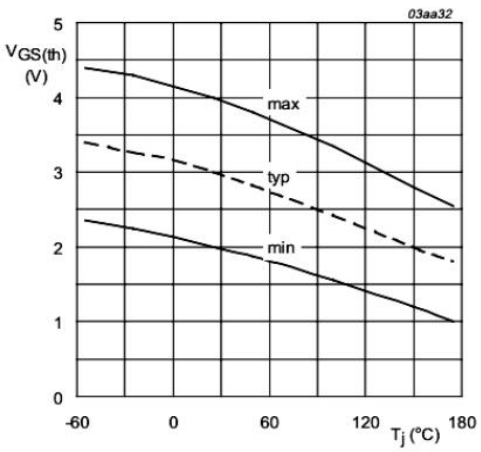
T_j = 25 °C

Fig 7. Drain-source on-state resistance as a function of drain current; typical values.



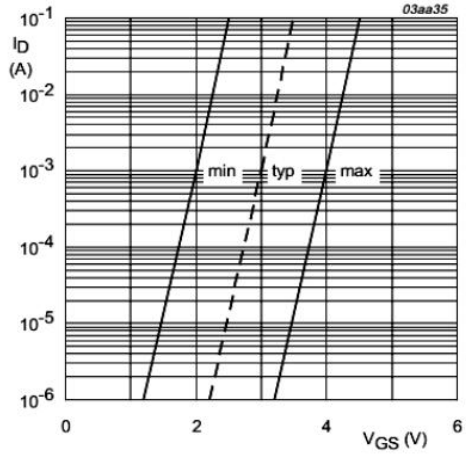
$$a = \frac{R_{DSon}}{R_{DSon(25°C)}}$$

Fig 8. Normalized drain-source on-state resistance factor as a function of junction temperature.



I_D = 1 mA; V_{DS} = V_{GS}

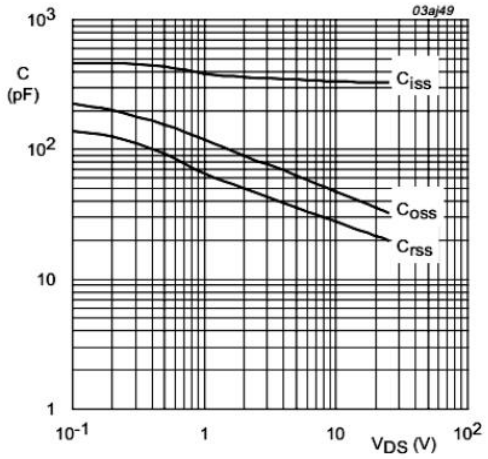
Fig 9. Gate-source threshold voltage as a function of junction temperature.



T_j = 25 °C

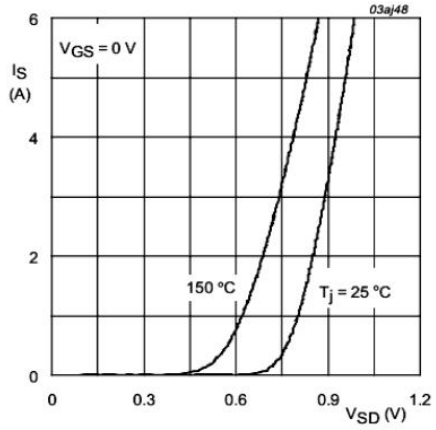
Fig 10. Sub-threshold drain current as a function of gate-source voltage.

CHARACTERISTIC CURVES (Cont..)



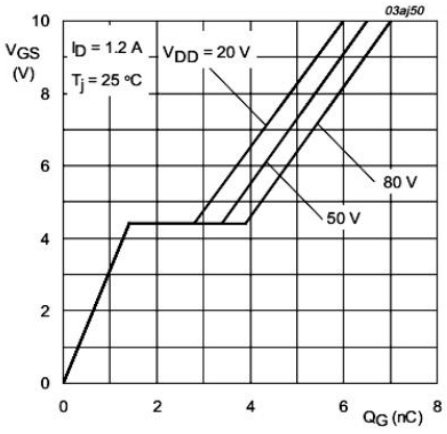
V_{GS} = 0 V; f = 1 MHz

Fig 11. Input, output and reverse transfer capacitances as a function of drain-source voltage; typical values.



T_j = 25 °C and 150 °C; V_{GS} = 0 V

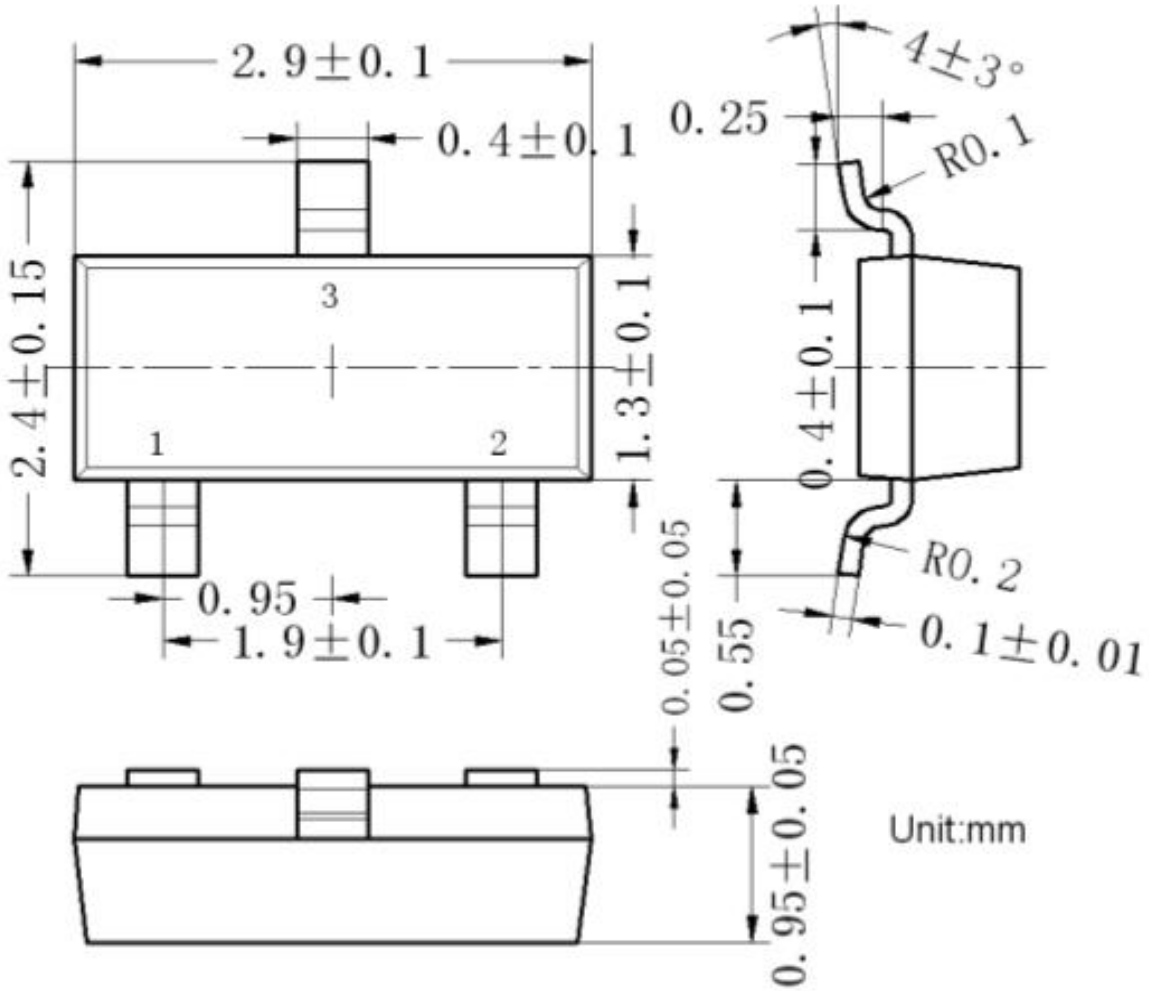
Fig 12. Source (diode forward) current as a function of source-drain (diode forward) voltage; typical values.



I_D = 1.2 A; V_{DD} = 20 V, 50 V, 80 V

Fig 13. Gate-source voltage as a function of gate charge; typical values.

SOT-23 PACKAGE DIMENSIONS AND OUTLINE



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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