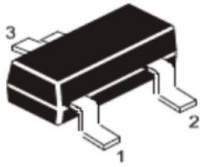
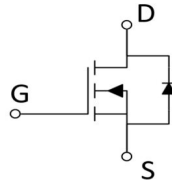


N CHANNEL STANDARD LEVEL FET

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

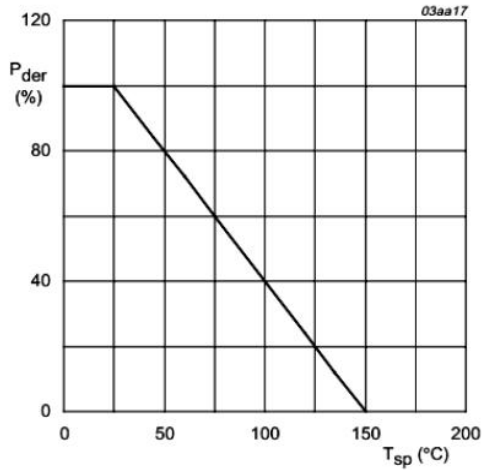
MAXIMUM RATINGS ($T_a = 25^\circ\text{C}$ unless otherwise specified)

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	$T_{sp} = 25^\circ\text{C}$	A
		$T_{sp} = 100^\circ\text{C}$	
Pulsed Drain Current	I_{DM}	7.6	
Total Power Dissipation	P_{tot}	2	W
junction temperature	T_J	-55 to 150	$^\circ\text{C}$
storage temperature	T_{STG}	-55 to 150	$^\circ\text{C}$
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 ($T_j = 25^\circ\text{C}$ unless otherwise specified)

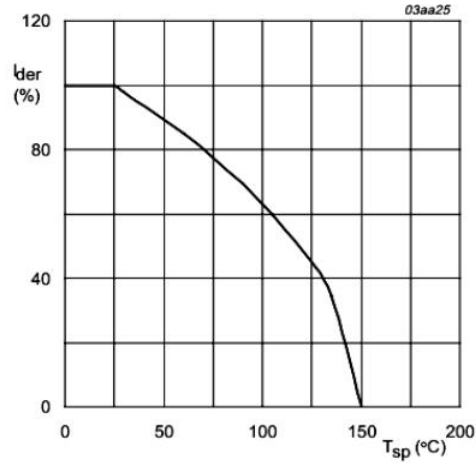
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNITS
STATIC CHARACTERISTICS						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	100			V
		$V_{GS}=0V, I_D=250\mu A, T_j=-55^\circ\text{C}$	90			
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=1mA$	1.3	1.8	2.5	V
		$V_{DS}=V_{GS}, I_D=1mA, T_j=150^\circ\text{C}$	1.2			
		$V_{DS}=V_{GS}, I_D=1mA, T_j=-55^\circ\text{C}$			4.4	
Gate-body Leakage current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 20V$		± 10	± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=100V, V_{GS}=0V$			1	μA
		$V_{DS}=100V, V_{GS}=0V, T_j=150^\circ\text{C}$			100	
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=0.5$		213	250	m Ω
		$V_{GS}=10V, I_D=0.5, T_j=150^\circ\text{C}$		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	$t_{d(on)}$	$V_{DD}=50V; R_L=33\Omega; V_{GS}=10V; R_G=6\Omega$		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}	$I_S=1.2A, dI/dt=-100A/\mu s, V_{GS}=0V$		36		ns
Body Diode Reverse Recovery Charge	Q_{rr}	$V_{GS}=0V$		23		nC

CHARACTERISTIC CURVES



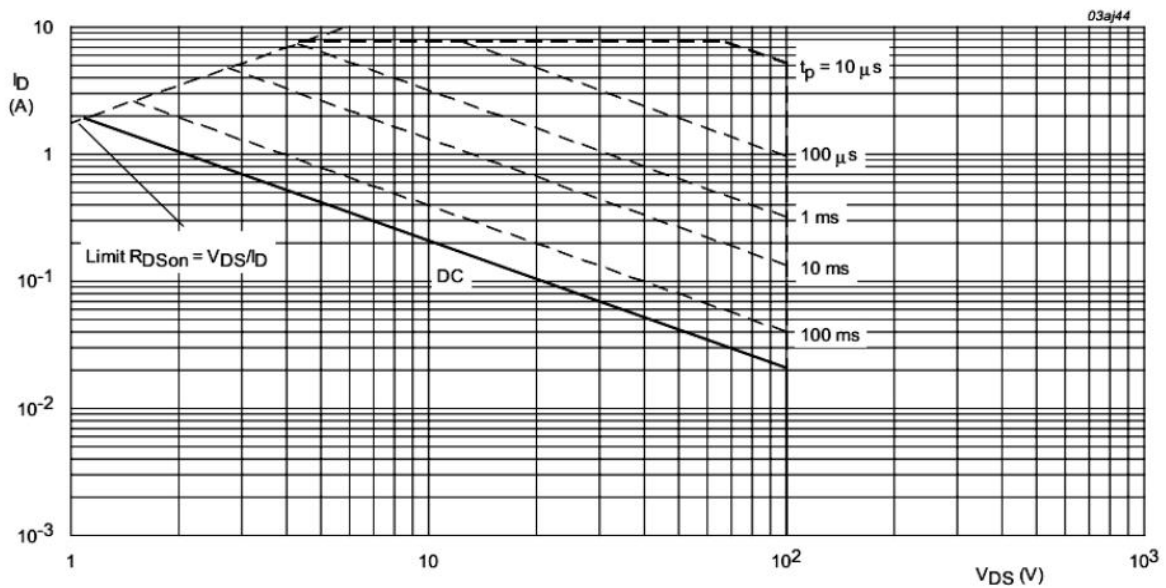
$$P_{der} = \frac{P_{tot}}{P_{tot(25^{\circ}C)}} \times 100\%$$

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..)

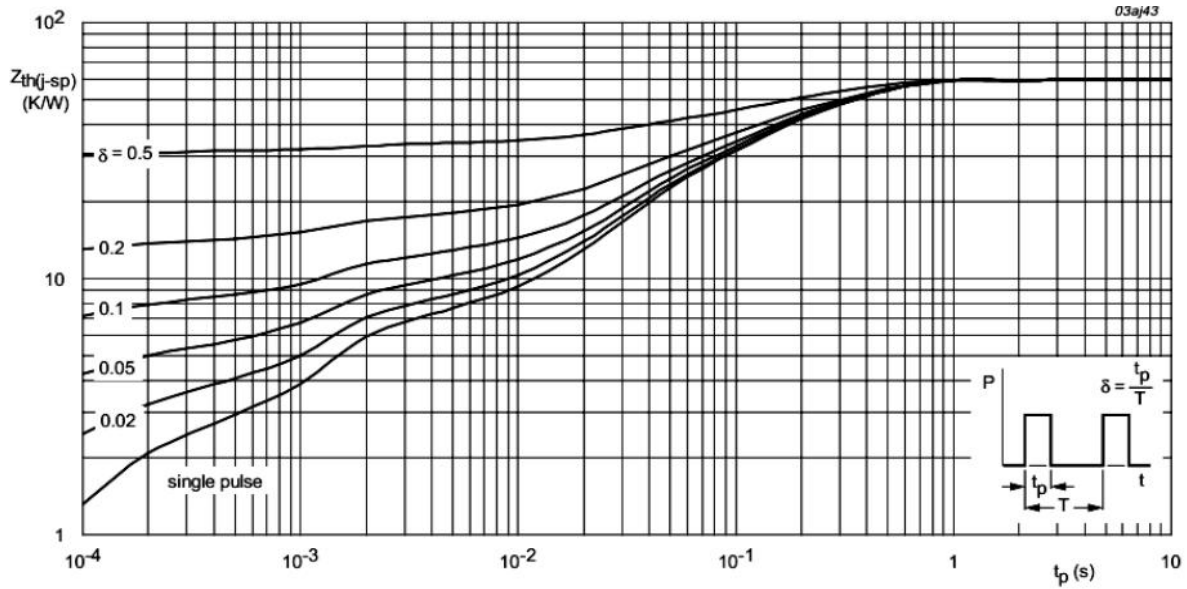
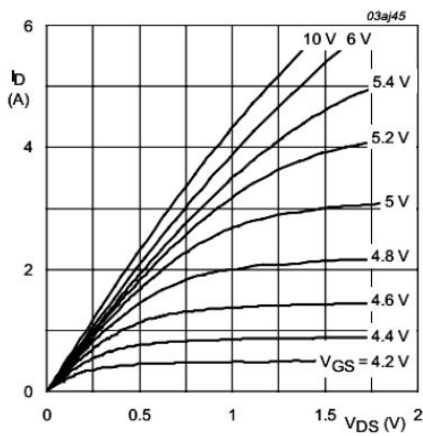
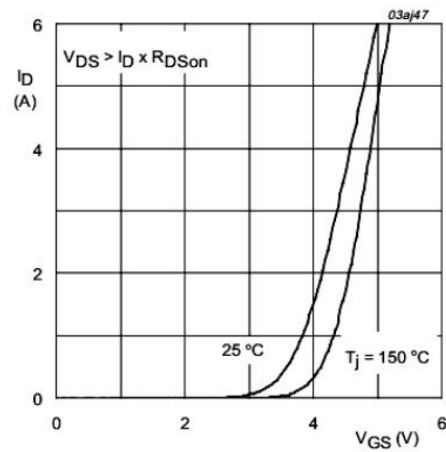


Fig 4. Transient thermal impedance from junction to solder point as a function of pulse duration.



$T_j = 25^\circ\text{C}$

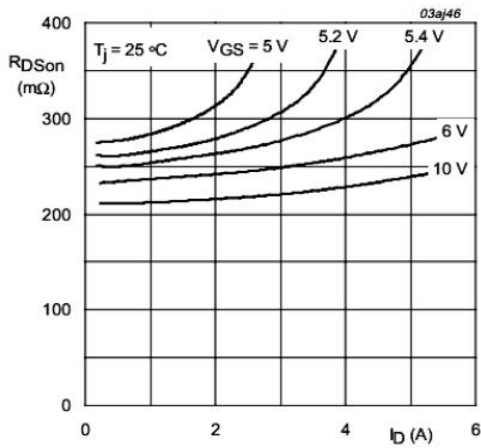
Fig 5. Output characteristics: drain current as a function of drain-source voltage; typical values.



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

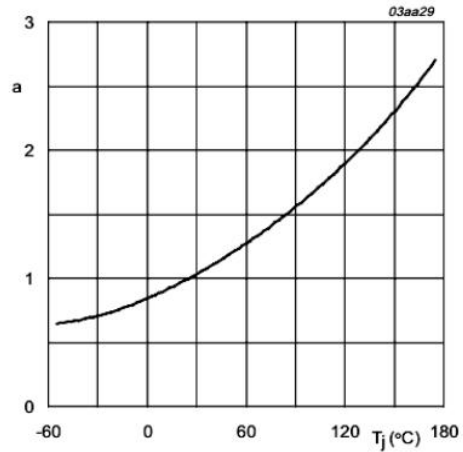
Fig 6. Transfer characteristics: drain current as a function of gate-source voltage; typical values.

CHARACTERISTIC CURVES (Cont..)



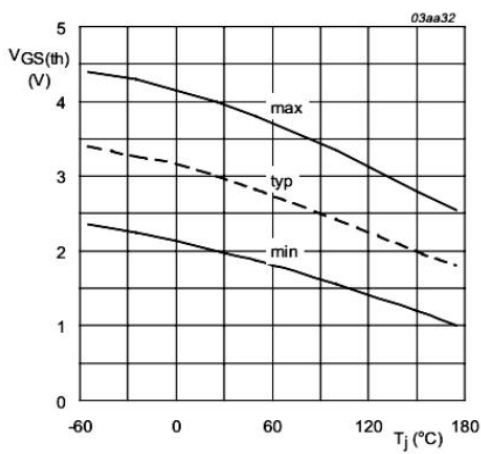
$T_j = 25^\circ\text{C}$

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



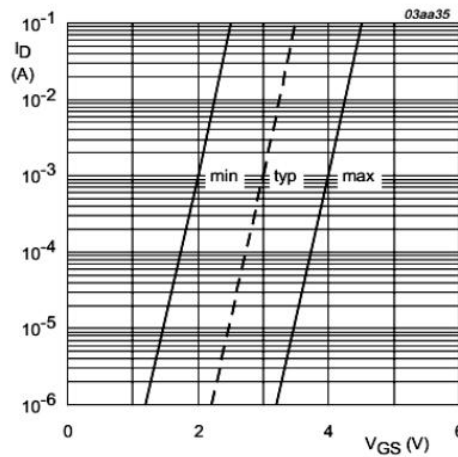
$$a = \frac{R_{DSon}}{R_{DSon(25^\circ\text{C})}}$$

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



$I_D = 1\text{ mA}; V_{DS} = V_{GS}$

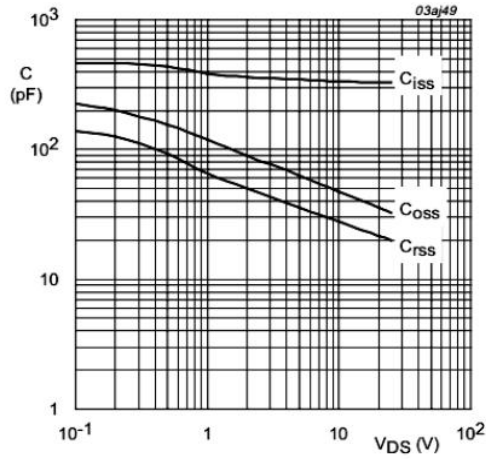
Fig 9. Gate-source threshold voltage as a function of junction temperature.



$T_j = 25^\circ\text{C}$

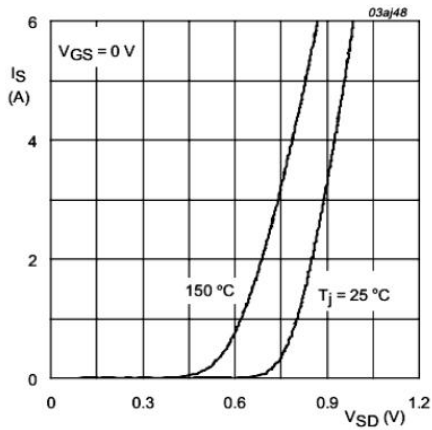
Fig 10. Sub-threshold drain current as a function of gate-source voltage.

CHARACTERISTIC CURVES (Cont..)



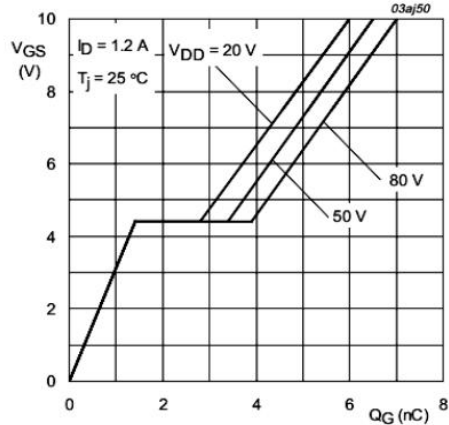
$V_{GS} = 0\text{ V}; f = 1\text{ MHz}$

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



$T_j = 25\text{ °C and }150\text{ °C}; V_{GS} = 0\text{ V}$

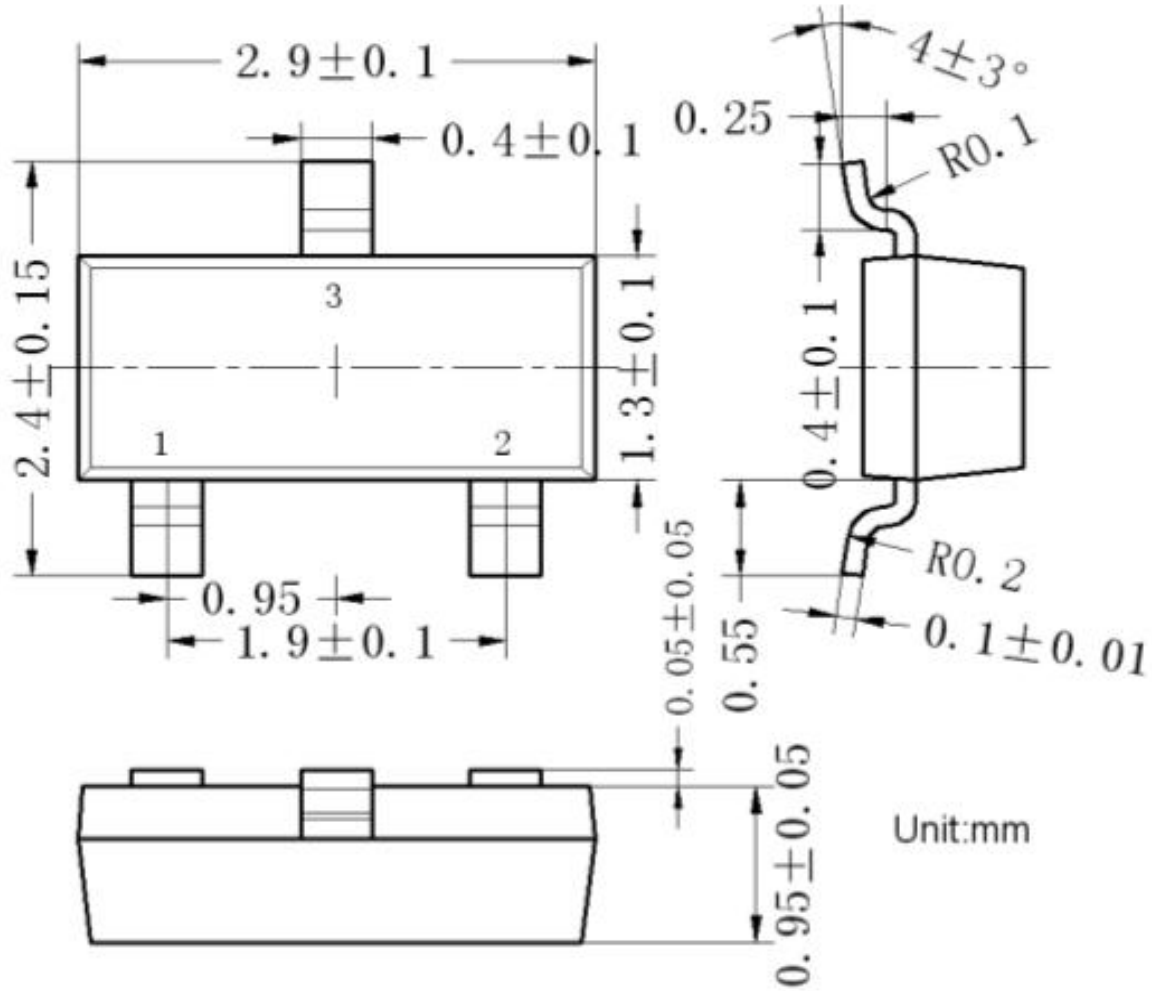
Fig 12. Source (diode forward) current as a function of source-drain (diode forward) voltage; typical values.



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

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

SOT-23 PACKAGE DIMENSIONS AND OUTLINE





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Customer Notes:

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

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