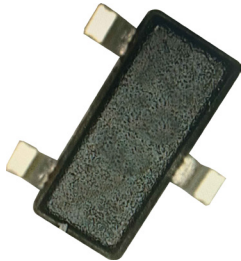


RoHS  
Compliant



## Feature

- Trench FET Power MOSFET

## Absolute Maximum Ratings (TA = 25°C Unless otherwise specified)

Parameter			Symbol	Value	Unit
Drain-Source Voltage			V <sub>DS</sub>	40	V
Gate-Source Voltage			V <sub>GS</sub>	±20	
Continuous Drain Current	Steady State	TA = 25°C	I <sub>D</sub>	2.3	A
		TA = 70°C		1.85	
Maximum Power Dissipation <sup>1</sup>	Steady State	TA = 25°C	P <sub>D</sub>	0.75	W
		TA = 70°C		0.48	
Pulsed Drain Current <sup>2</sup>			I <sub>DM</sub>	12	A
Source Current (Body Diode) <sup>1</sup>			I <sub>S</sub>	0.62	
Junction Temperature			T <sub>J</sub>	150	°C
Storage Temperature			T <sub>STG</sub>	-55 to +150	

## Thermal Resistance

Parameter		Symbol	Typ.	Max.	Unit
Maximum Junction-to-Ambient <sup>1</sup>		R <sub>thJA</sub>	75	100	°C/W
Maximum Junction-to-Ambient <sup>3</sup>	(Steady State)		120	166	
Maximum Junction-to-Foot (Drain)	(Steady State)		40	50	

## Electrical Characteristics at (TA = 25 °C Unless otherwise specified)

Parameter	Symbol	Test Conditions	Value			Unit
			Min.	Typ.	Max.	
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA	40	-	-	V
Gate-Threshold Voltage <sup>4</sup>	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA	1	-	3	
Gate-body Leakage current	I <sub>less</sub>	V <sub>DS</sub> = 0V, V <sub>GS</sub> = ±20V	-	-	±100	nA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = 40V, V <sub>GS</sub> = 0V	-	-	1	μA
		V <sub>DS</sub> = 40V, V <sub>GS</sub> = 0V, T <sub>J</sub> = 55°C	-	-	10	
On-State Drain Current	I <sub>D(on)</sub>	V <sub>DS</sub> ≤ 5V, V <sub>GS</sub> = 10V	6	-	-	A
Drain-Source On-Resistance <sup>4</sup>	R <sub>DS(on)</sub>	V <sub>GS</sub> = 10V, I <sub>D</sub> = 3A	-	70	82	mΩ
		V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 2.4A	-	95	130	

Parameter	Symbol	Test Conditions	Value			Unit
			Min.	Typ.	Max.	
Forward Trans conductance <sup>4</sup>	$g_{fs}$	$V_{DS} = 5V, I_D = 3A$	-	7	-	S
Input Capacitance	$C_{iss}$	$V_{GS} = 0V$ $V_{DS} = -20V$ $f = 1MHz$	-	470	-	pF
Output Capacitance	$C_{oss}$		-	85	-	
Reverse Transfer Capacitance	$C_{rss}$		-	65	-	
Total gate charge	$Q_G$	$V_{GS} = 10V,$ $I_D = 3A,$ $V_{DS} = 20V$	-	11.3	17	nC
Gate-source charge	$Q_{GS}$		-	1.7	-	
Gate-drain charge	$Q_{GD}$		-	3.3	-	
Turn-on delay time	$t_{d(on)}$	$V_{DD} = 20V, I_D = 1A,$ $R_G = 6\Omega, V_{GEN} = 4.5V$ $R_L = 20\Omega$	-	7	15	ns
Rise time	$t_r$		-	15	25	
Turn-off delay time	$t_{d(off)}$		-	25	40	
Fall time	$t_f$		-	25	40	
Diode Forward Voltage <sup>4</sup>	$V_{SD}$	$I_S = 1.25A, V_{GS} = 0V$	-	0.8	1.2	V

### Notes:

- 1 Surface Mounted on FR4 Board.  $t \leq 5s$ .
- 2 Pulse width limited by maximum junction temperature.
- 3 Surface Mounted on FR4 Board.
- 4 Pulse test:  $PW \leq 300 \mu s$ , duty cycle  $\leq 2\%$ .
- 5 For PNP device voltage and current values will be negative (-).

### Recommended Reflow Solder Profiles

The recommended reflow solder profiles for Pb and Pb-free devices are shown below.

Figure 1 shows the recommended solder profile for devices that have Pb-free terminal plating, and where a Pb free solder is used.

Figure 2 shows the recommended solder profile for devices with Pb-free terminal plating used with leaded solder, or for devices with leaded terminal plating used with a leaded solder.

Figure 1

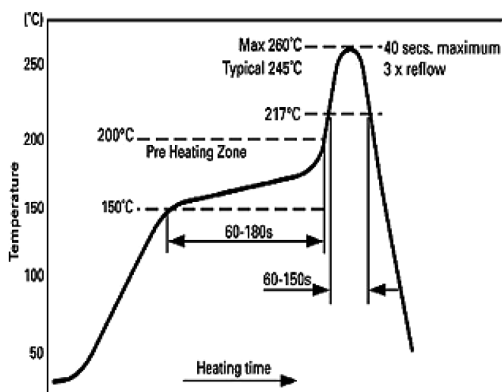
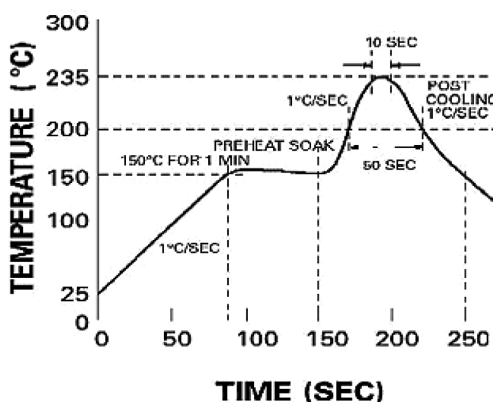


Figure 2

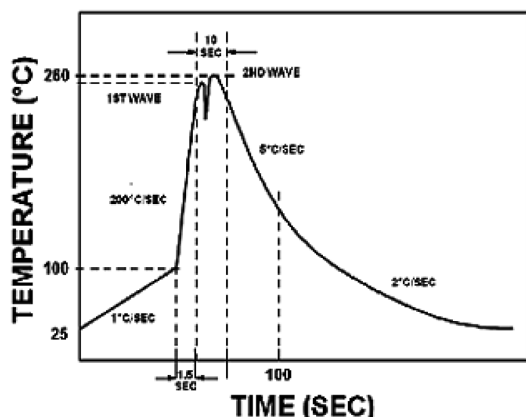


## Reflow Profiles in Tabular Form

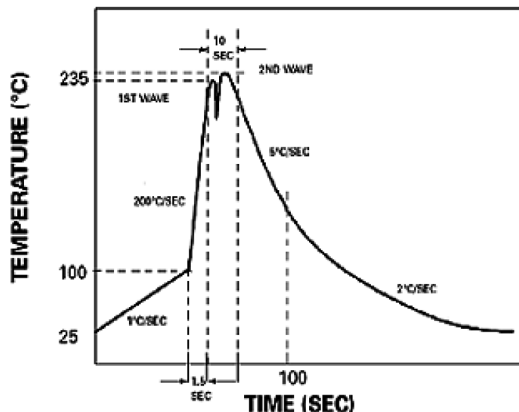
Profile Feature	Sn-Pb System	Pb-Free System
Average Ramp-Up Rate	~3°C/second	~3°C/second
<b>Preheat</b> Temperature Range Time	150-170°C 60-180 seconds	150-200°C 60-180 seconds
<b>Time maintained above:</b> Temperature Time	200°C 30-50 seconds	217°C 60-150 seconds
Peak Temperature	235°C	260°C max.
Time within +0 -5°C of actual Peak	10 seconds	40 seconds
Ramp-Down Rate	3°C/second max.	6°C/second max.

## Recommended Wave Solder Profiles

The Recommended solder Profile For Devices with Pb-free terminal plating where a Pb-free solder is used



The Recommended solder Profile For Devices with Pb-free terminal plating used with leaded solder, or for devices with leaded terminal plating used with leaded solder



## Wave Profiles in Tabular Form

Profile Feature	Sn-Pb System	Pb-Free System
Average Ramp-Up Rate	~200°C/second	~200°C/second
Heating rate during preheat	Typical 1-2, Max 4°C/sec	Typical 1-2, Max 4°C/Sec
Final preheat Temperature	Within 125°C of Solder Temp.	Within 125°C of Solder Temp.
Peak Temperature	235°C	260°C max.
Time within +0 -5°C of actual Peak	10 seconds	10 seconds
Ramp-Down Rate	5°C/second max.	5°C/second max.

## Typical Characteristics Curves

Fig 1: Output Characteristics

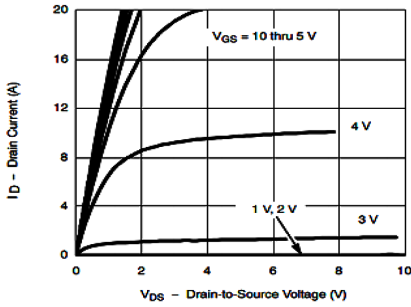


Fig 2: On-Resistance vs Drain Current

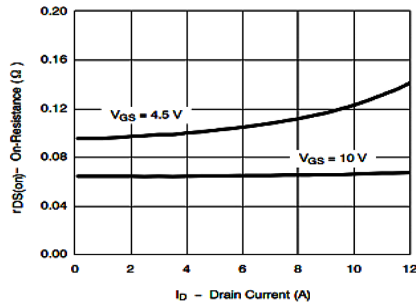


Fig 3: Gate Charge

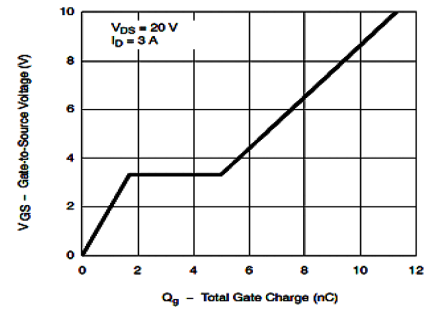


Fig 4: Transfer Characteristics

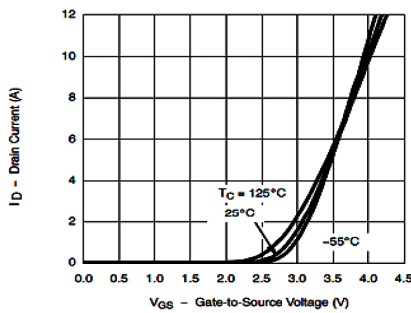


Fig 5: Capacitance

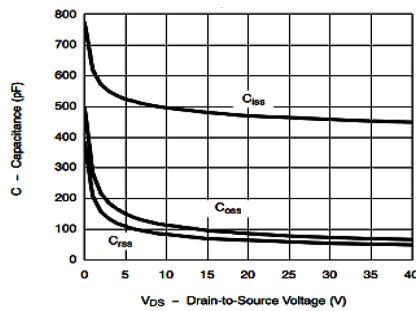


Fig 6: On-Resistance vs Junction Temperature

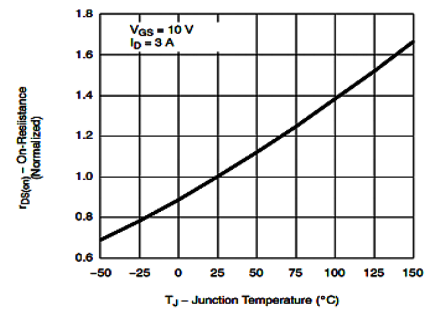


Fig 7: Source-Drain Diode Forward Voltage

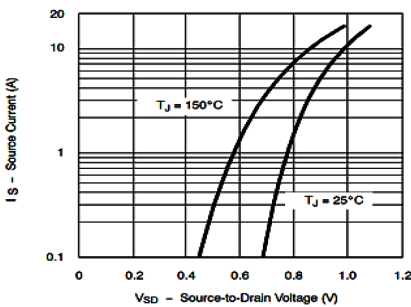


Fig 8: Threshold Voltage

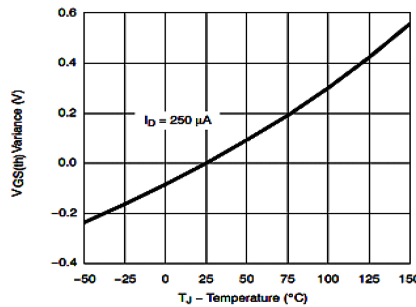


Fig 9: On-Resistance vs Gate-to-Source Voltage

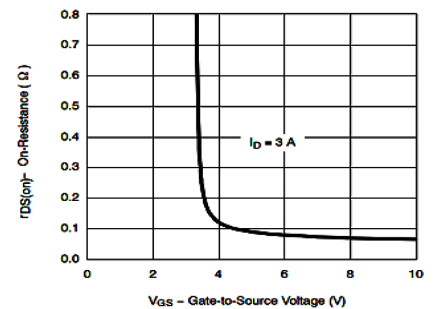


Fig 10: Single Pulse Power

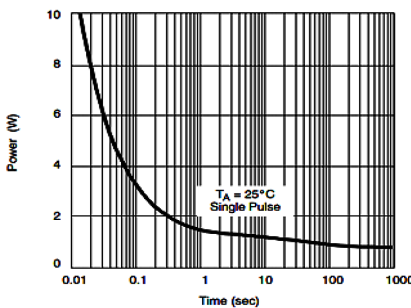


Fig 11: Safe Operating Area, Junction-to-Case

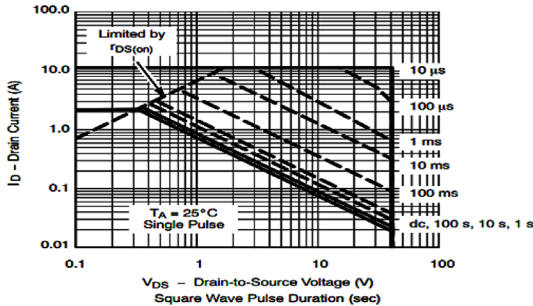
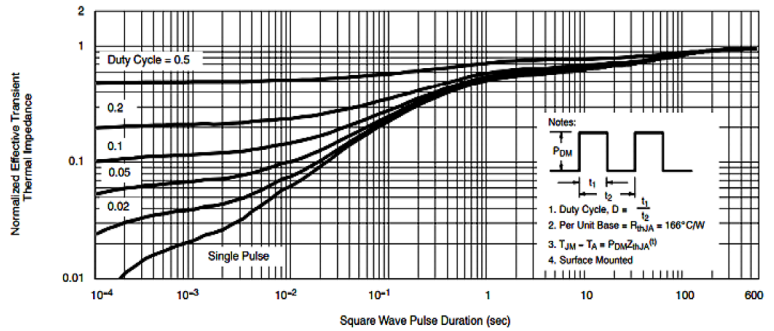
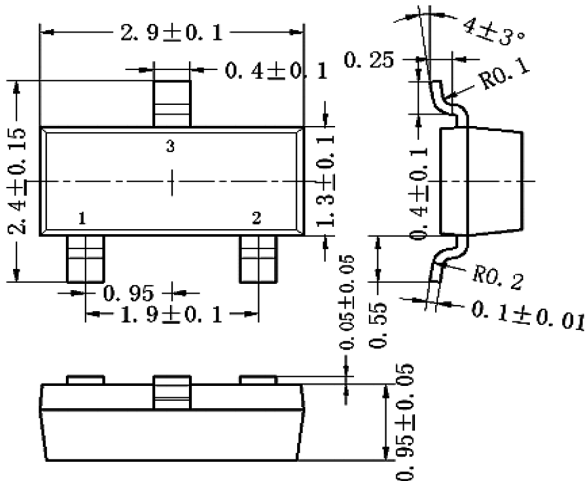


Fig 12: Normalized Thermal Transient Impedance, Junction-to-Ambient

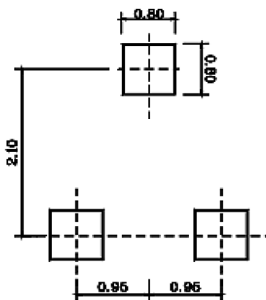


## Diagram

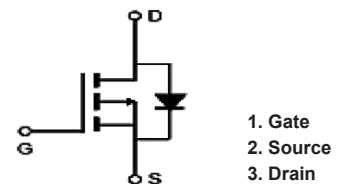
### SOT-23 SMD Package



### Suggested Pad Layout



### Pin configuration



## Part Number Table

Description	Part Number
P Channel Plastic Encapsulate MOSFET, SOT 23	CDM2319DS

Dimensions : Millimetres

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