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N-Channel Enhancement Mode Field Effect Transistor

Features

20V/6A

$R_{DS(ON)}$ = 21mΩ @ V_{GS} = 4.5V

$R_{DS(ON)}$ = 34mΩ @ V_{GS} = 2.5V

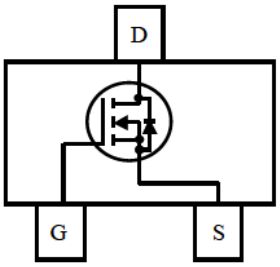
SOT23 Package

General Description

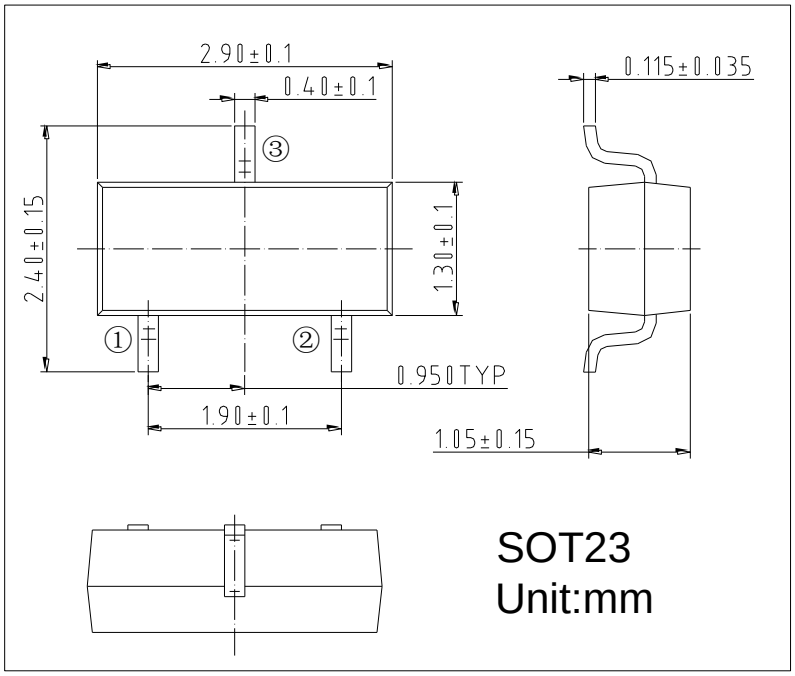
The CE2300 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 1.8V. This device is suitable for use as a load switch or in PWM applications.

Pin Configurations

See Diagram below (top view)



Package Information



Absolute Maximum Ratings @T_A=25℃ unless otherwise noted

Parameter		Symbol	Ratings	Unit
Drain-Source Voltage		V_{DSS}	20	V
Gate-Source Voltage		V_{GSS}	±12	V
Drain Current (Continuous)	T_A=25°C	I_D	6	A
	T_A=70°C		5	

Drain Current (Pulse)		I_{DM}	20	A
Power Dissipation	T_A=25°C	P_D	1	W
Operating Temperature/ Storage Temperature		T_J/T_{STG}	-55~150	℃

- **Electrical Characteristics** @T_A=25℃ unless otherwise noted

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D=250μA	20	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 20 V, V_{GS} = 0V	--	--	1	μA
Gate Threshold Voltage	$V_{GS(TH)}$	V_{GS} =V_{DS} , I_{DS}=250μA	0.4	0.9	1.2	V
Gate Leakage Current	I_{GSS}	V_{GS}= ± 12V, V_{DS}=0V	--	--	100	nA
Drain-Source On-state Resistance	$R_{DS(on)}$	V_{GS} = 4.5V, I_D = 6A	--	21	28	mΩ
		V_{GS} =2.5V, I_D = 5.2A	--	34	45	mΩ
Forward Transconductance	g_{FS}	V_{DS}=10V, I_D=6A	--	5	--	S
Diode Forward Voltage	V_{SD}	I_{SD}=1.7A, V_{GS}=0V	--	0.8	1.2	V
Maximum Body-Diode Continuous Current	I_S		--	--	1.7	A
Switching						
Total Gate Charge	Q_g	V_{GS}=4.5V, V_{DS}=10V, I_D=6A	--	7.7	--	nC
Gate-Source Charge	Q_{gs}		--	3.2	--	nC
Gate-Drain Charge	Q_{gd}		--	2.1	--	nC
Turn-on Delay Time	$t_{d(on)}$	V_{DS} = 10V, I_D = 1A, V_{GS} = 4.5V, R_G = 6Ω	--	78.7	--	ns
Turn-on Rise Time	tr		--	128	--	ns
Turn-off Delay Time	$t_{d(off)}$		--	453	--	ns
Turn-off Fall Time	tf		--	80.9	--	ns
Dynamic						
Input Capacitance	C_{iss}	V_{DS} = 15V, V_{GS} = 0V,f = 1.0MHz	--	574	--	pF
Output Capacitance	C_{oss}		--	70	--	pF
Reverse Transfer Capacitance	C_{rss}		--	60	--	pF

A: The value of $R_{\theta JA}$ is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with T_A=25°C. The value in any given application depends on the user's specific board design.

B: Repetitive rating, pulse width limited by junction temperature.

C: The current rating is based on the t≤ 10s junction to ambient thermal resistance rating.

- **Typical Performance Characteristics**

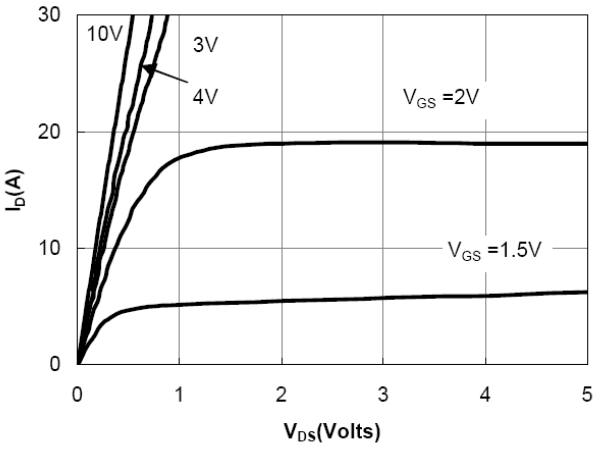


Figure 1: On-Regions Characteristics

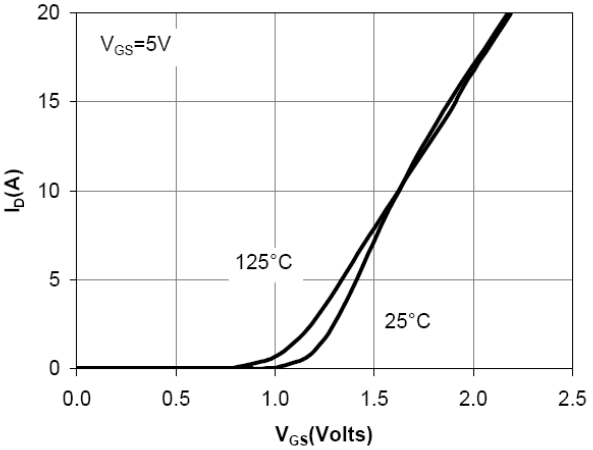


Figure 2: Transfer Characteristics

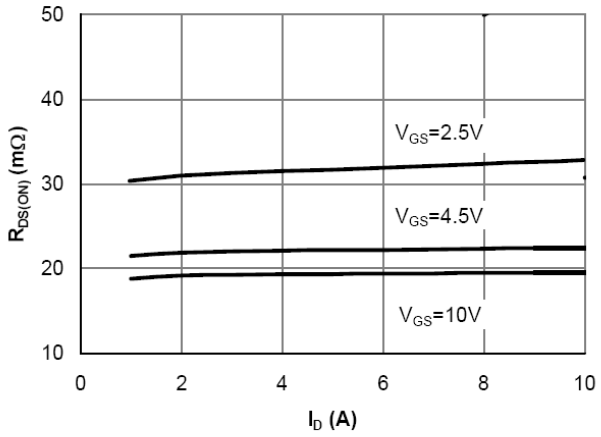


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

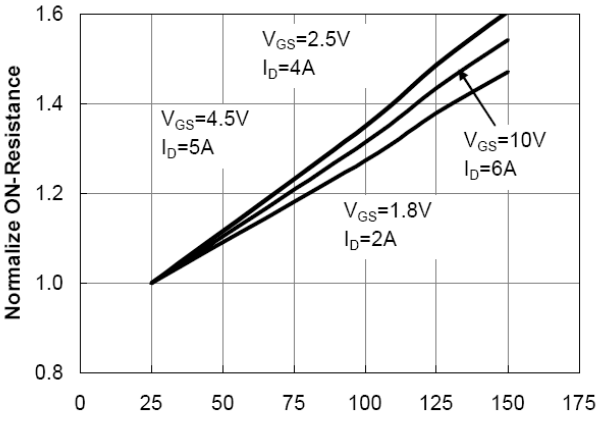


Figure 4: On-Resistance vs. Junction Temperature

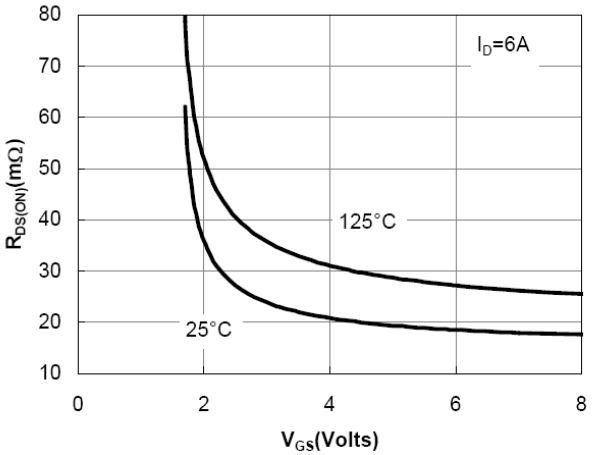


Figure 5: On-Resistance vs. Gate-Source Voltage

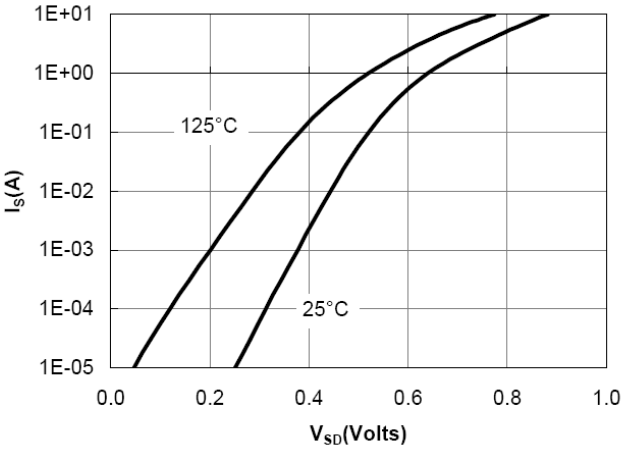


Figure 6: Body-Diode Characteristics

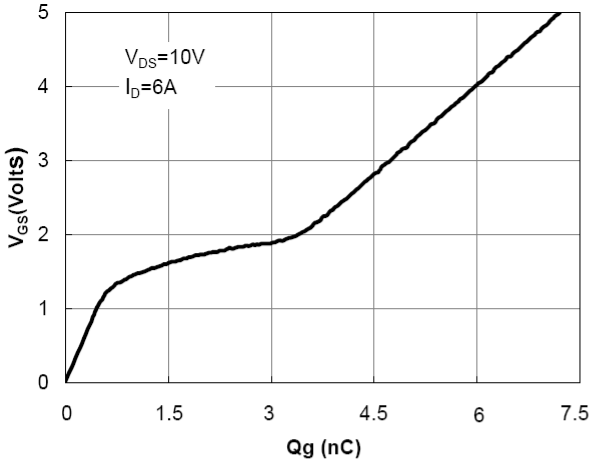


Figure 7: Gate-Charge Characteristics

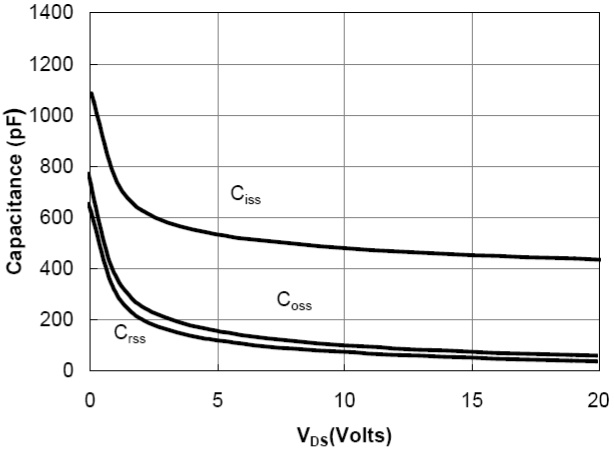


Figure 8: Capacitance Characteristics

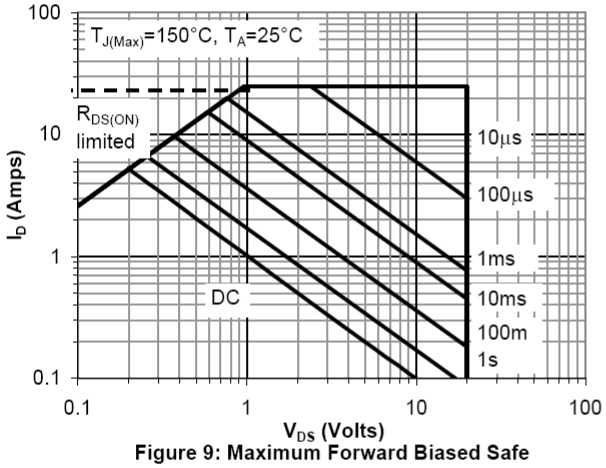


Figure 9: Maximum Forward Biased Safe Operating Area

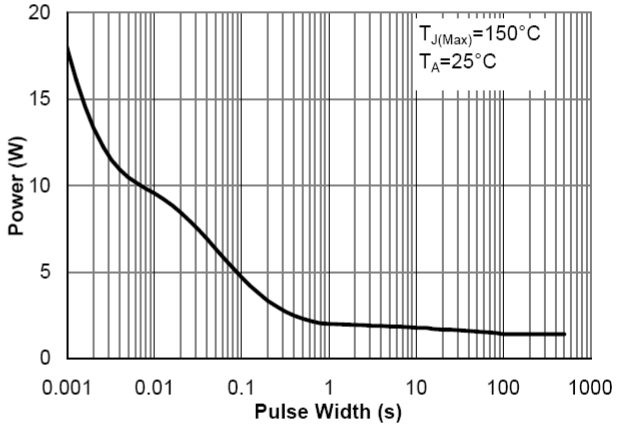


Figure 10: Single Pulse Power Rating Junction-to-Ambient

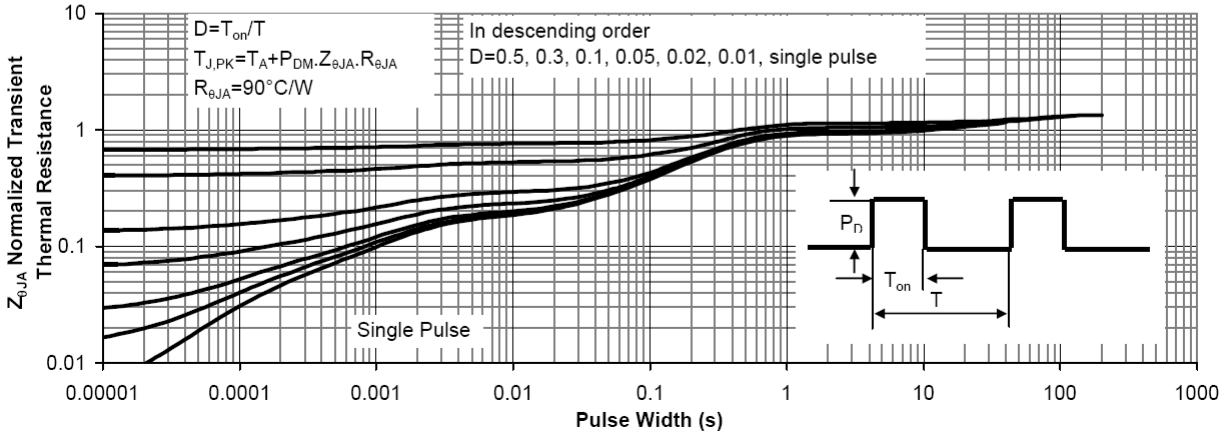


Figure 11: Normalized Maximum Transient Thermal Impedance