20VDS/ ±10VGS/2.9A(ID)	Part No	CM2302

Description

The NCE2302 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as a Battery protection or in other Switching application.

Application

- ●Battery protection
- ●Load switch
- ●Power management

Product Summary

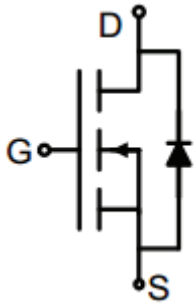
VDS= 20V,ID= 2.9A

RDS(ON)< 59mΩ@ VGS=2.5V

RDS(ON)< 45mΩ@ VGS=4.5V

lead-free

SOT-23 Package



Absolute Maximum Ratings (TA=25℃unless otherwise noted)

Parameter	Symbol	Maximum	Units
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	±10	V
Continuous Current Drain	I_D	2.9	A
Pulsed Drain Current	I_{DM}	10	A
Power Description	P_D	1	W
Operating Junction and Storage Temperature Range	Tj， TSTG	-55°C to 150°	℃
Thermal Resistance Junction to Ambient (PCB mounted)[b]	$R_{\theta JA}$	125	℃/w

Electrical Characteristics (TA=25℃unless otherwise noted)

Parameter	symbol	Test Conditions	Min	Type	Max	Units
Off Characteristics						
Drain-Source Breakdown Voltage	B_{VDSS}	VGS = 0V, ID=250μA	20	22	-	V
Zero Gate Voltage Drain Current	I_{DSS}	VDS=20V,VGS=0V	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	VGS=±10V,VDS=0V	-	-	±100	nA
On Characteristics (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	VDS=VGS, ID=250uA	0.5	0.85	1.2	V
Drain-Source On-State Resistance	RDS(ON)	VGS=2.5V, ID=2.5A	-	37	59	mΩ
		VGS=4.5V, ID=2.9A		30	45	
Forward Trans conductance	g_{FS}	VDS=5V,ID=2.9A	-	8	-	S
Dynamic Characteristics (Note4)						
Input Capacitance	Clss	VDS=10V VGS=0V, f=1.0MHz	-	300	-	PF
Output Capacitance	Coss		-	120	-	PF
Reverse Transfer Capacitance	Crss		-	80	-	PF
Switching Characteristics (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	VDD=10V,ID=2.9A VGS=4.5V,RGEN=6Ω	-	10	15	nS
Turn-on Rise Time	t_r		-	50	85	nS
Turn-Off Delay Time	$t_{d(off)}$		-	17	45	nS
Turn-Off Fall Time	$t_{d(off)}$		-	10	20	nS
Total Gate Charge	Qg	VDS=10V,ID=2.9A, VGS=4.5V		4.0	10	nC
Gate-Source Charge	Qgs			0.65	-	nC
Gate-Drain Charge	Q_{gd}		-	1.2	-	nC
Drain-Source Diode Characteristics						
Diode Forward Current (Note 2)	IS		-	-	2.9	A
Diode Forward Voltage (Note 3)	V_{SD}	VGS=0V,IS=2.9A	-	-	1.2	V

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

Typical Electrical and Thermal Characteristics

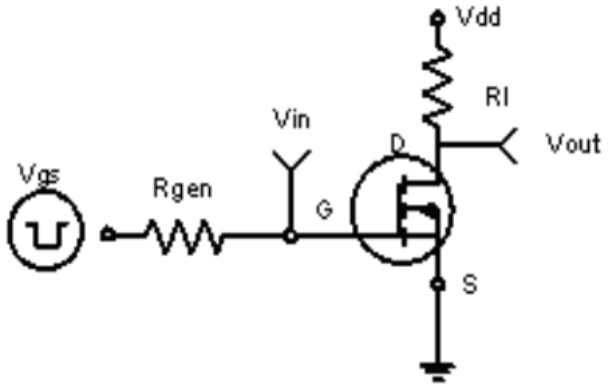


Figure 1: Switching Test Circuit

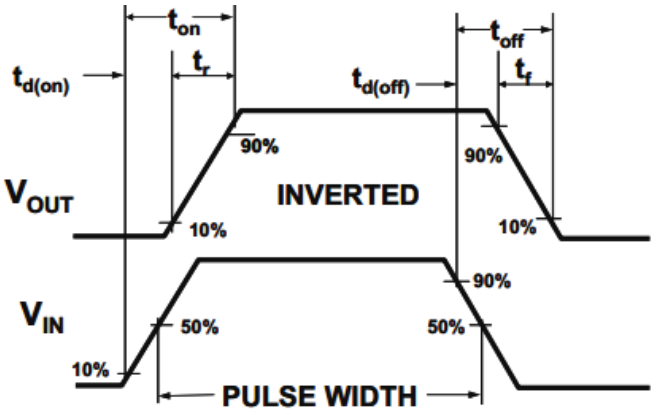
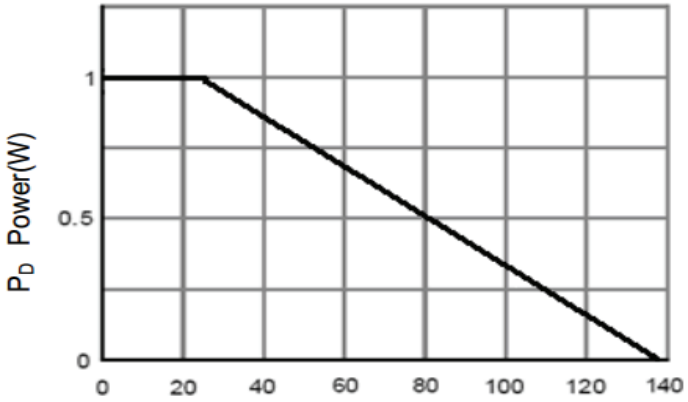
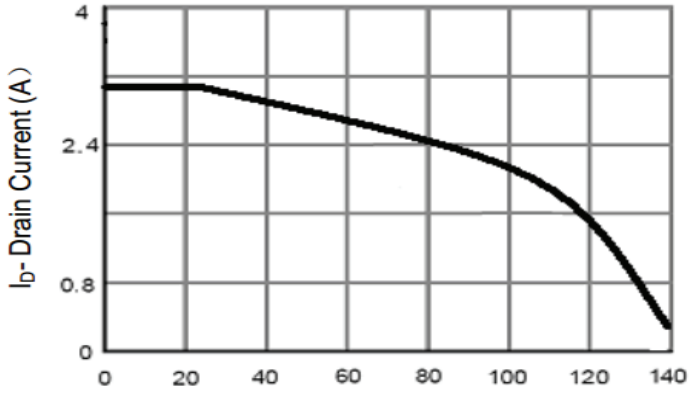


Figure 2: Switching Waveforms



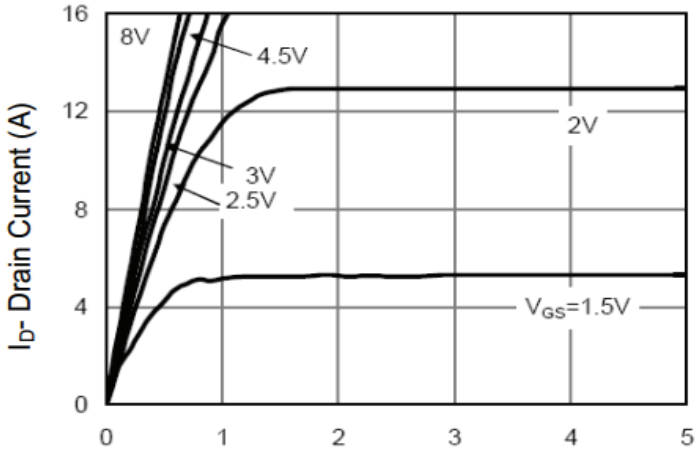
TJ-Junction Temperature(℃)

Figure 3 Power Dissipation



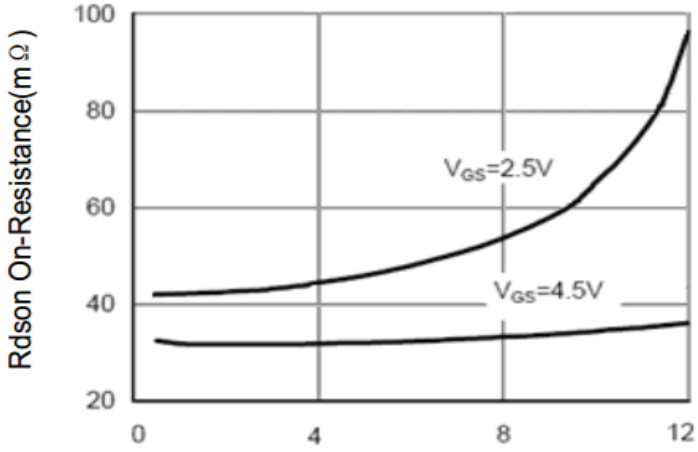
TJ-Junction Temperature(℃)

Figure 4 Drain Current



Vds Drain-Source Voltage (V)

Figure 5 Output CHARACTERISTICS



ID- Drain Current (A)

Figure 6 Drain-Source On-Resistance

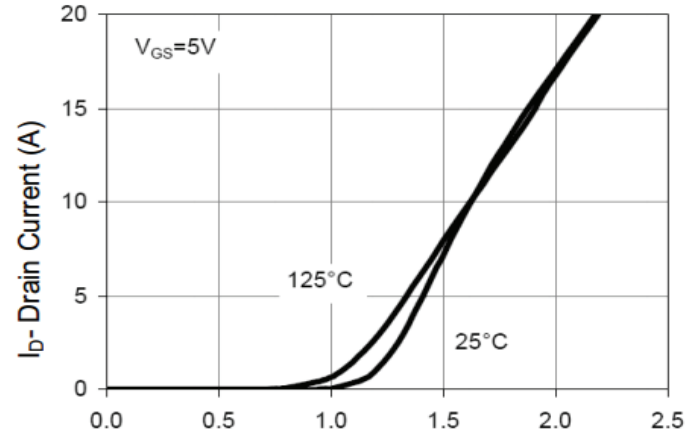


Figure 7 Transfer Characteristics

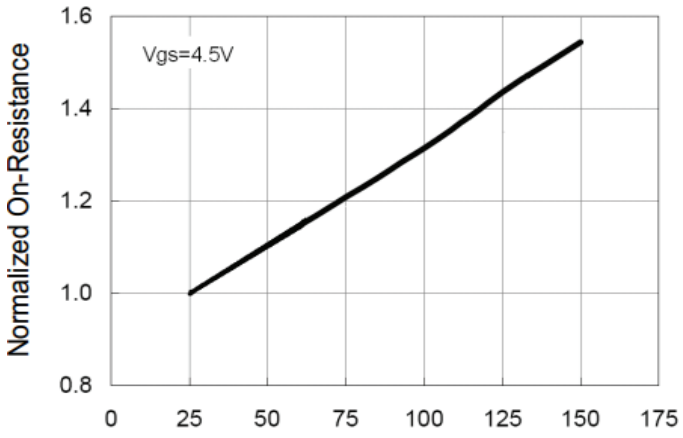


Figure 8 Drain-Source On-Resistance

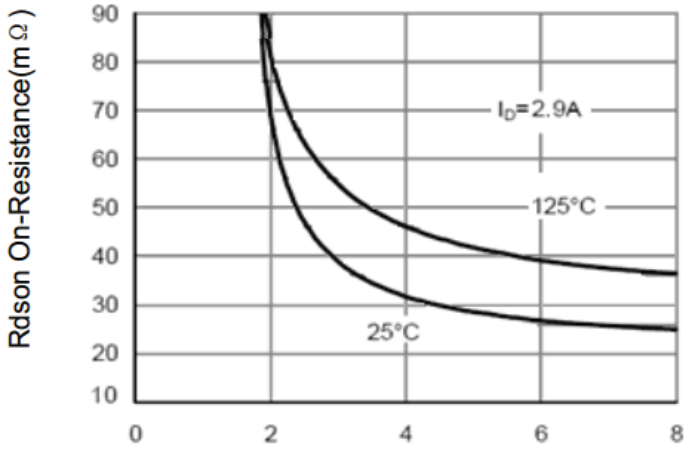


Figure 9 Rdson vs Vgs

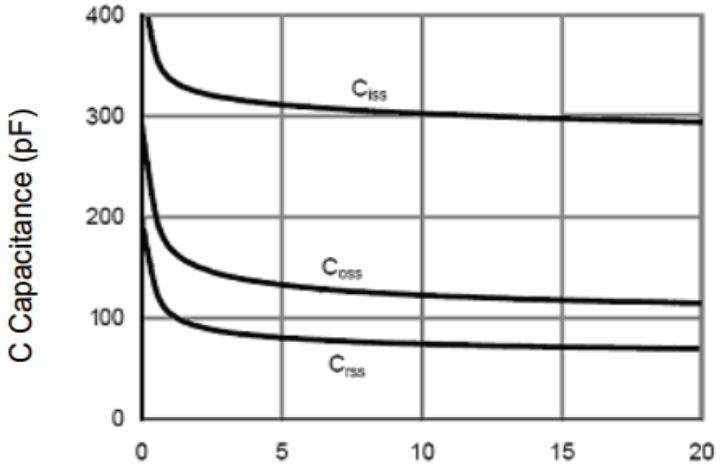


Figure 10 Capacitance vs Vds

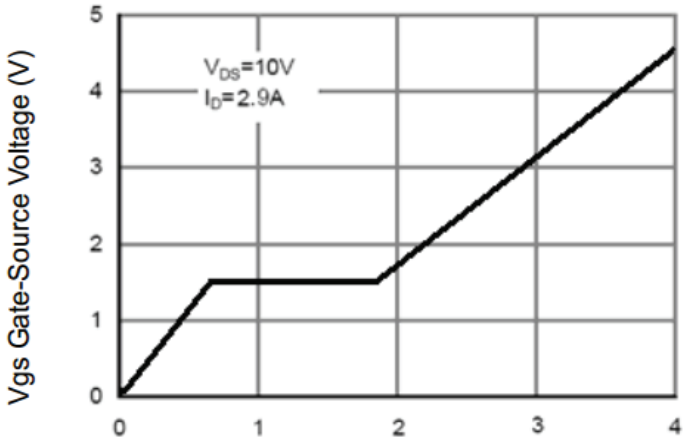


Figure 11 Gate Charge

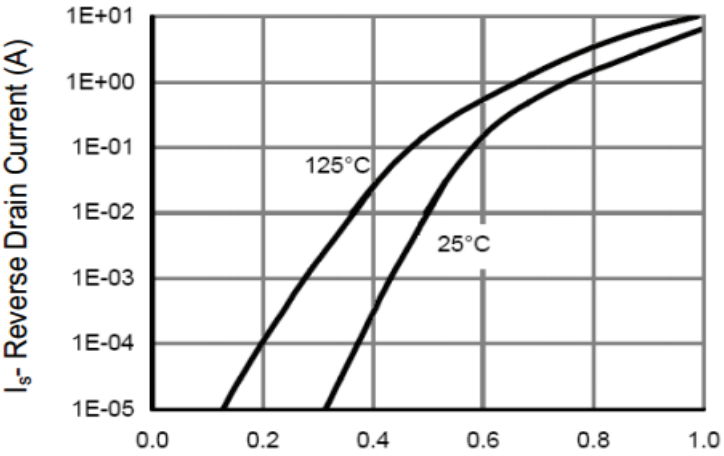


Figure 12 Source- Drain Diode Forward

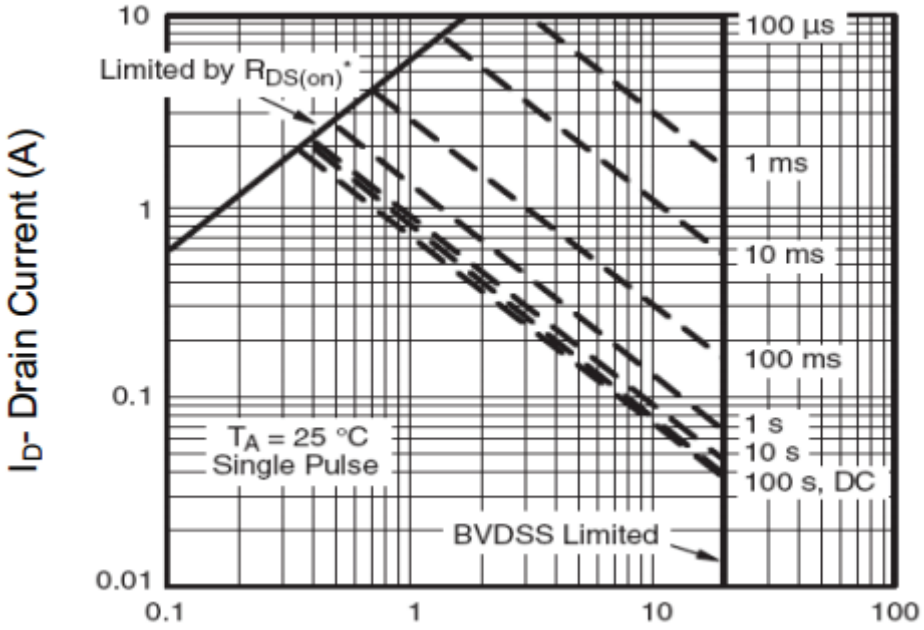


Figure 13 Safe Operation Area

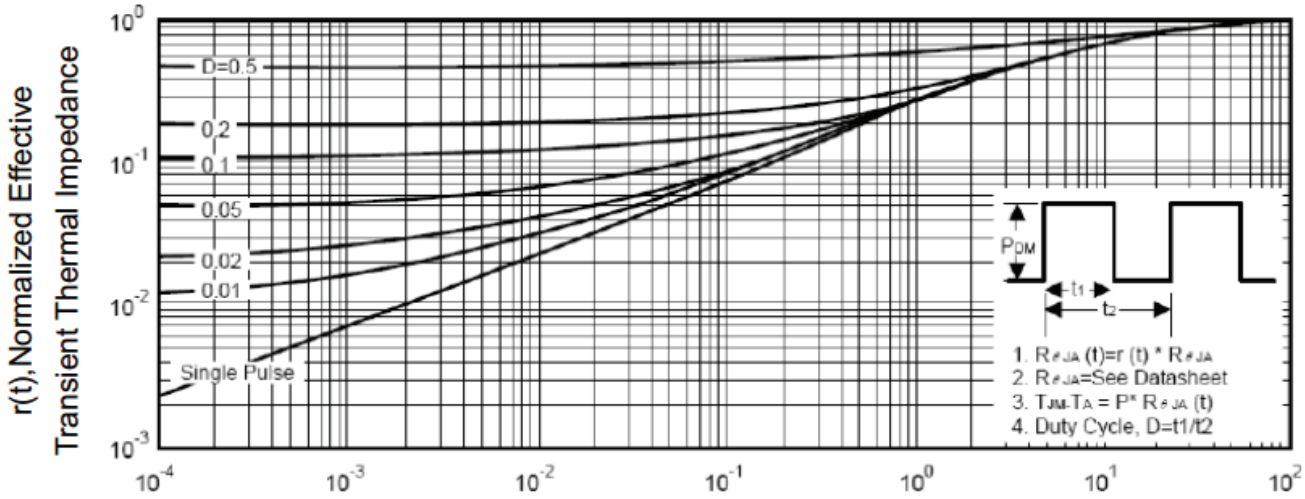


Figure 14 Normalized Maximum Transient Thermal Impedance