

CONSONANCE

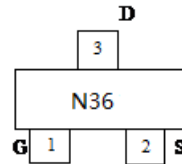
N-Channel Enhancement Mode Power MOSFET

CN30N06

General Description:

The CN30N06 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 0.9V. This device is suitable for use as a Battery protection or in other Switching application.

Pin Assignment



Applications:

- Battery protection
- Load switch
- Power management

Schematic diagram



Features:

- $V_{DS} = 30V, I_D = 5.8A$
 $R_{DS(ON)} = 32m\Omega @ V_{GS} = 2.5V$
 $R_{DS(ON)} = 26m\Omega @ V_{GS} = 4.5V$
 $R_{DS(ON)} = 18m\Omega @ V_{GS} = 10V$
- High power and current handling capability
- Available in SOT-23-3 Package
- Pb-free, rohs compliant and halogen free

Top view



Ordering Information

Part Number	Device Marking	Package	Operating Ambient Temperature
CN30N06	N36	SOT-23-3	-40°C to 85°C

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Absolute Maximum Ratings (T_A=25°C unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V _{DS}	30	V
Gate-Source Voltage	V _{GS}	±12	V
Drain Current-Continuous	I _D	5.8	A
Drain Current-Pulsed (Note 1)	I _{DM}	30	A
Maximum Power Dissipation	P _D	1.4	W
Operating Junction and Storage Temperature Range	T _J , T _{STG}	-55 to 150	°C

Thermal Characteristic

Thermal Resistance, Junction-to-Ambient (Note 2)	R _{θJA}	125	°C/W
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Electrical Characteristics (T_A=25°C unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	B _{VDS}	V _{GS} =0V, I _D =250μA	30	-	-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =30V, V _{GS} =0V	-	-	1	uA
Gate-Body Leakage Current	I _{GSS}	V _{GS} =±12V, V _{DS} =0V	-	-	±100	nA
On Characteristics (Note 3)						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	0.7	0.9	1.4	V
Drain-Source On-State Resistance	R _{DS(on)}	V _{GS} =10V, I _D =2.9A	-	18	25	mΩ
		V _{GS} =4.5V, I _D =2.9A	-	26	34	mΩ
		V _{GS} =2.5V, I _D =4A	-	32	40	mΩ
Forward Transconductance	g _{FS}	V _{DS} =5V, I _D =2.9A	10	-	-	A/V
Dynamic Characteristics (Note4)						
Input Capacitance	C _{ISS}	V _{DS} =15V, V _{GS} =0V, F=1.0MHz	-	623	-	PF
Output Capacitance	C _{OSS}		-	99	-	PF
Reverse Transfer Capacitance	C _{RSS}		-	77	-	PF
Switching Characteristics (Note 4)						
Turn-on Delay Time	td(on)	V _{DD} =15V, I _D =2.9A V _{GS} =10V, R _{GEN} =3Ω	-	3.3	-	nS
Turn-on Rise Time	tr		-	4.8	-	nS
Turn-Off Delay Time	td(off)		-	17	-	nS
Turn-Off Fall Time	tf		-	10	-	nS
Total Gate Charge	Q _g	V _{DS} =15V, I _D =5.8A, V _{GS} =4.5V	-	9.5	-	nC
Gate-Source Charge	Q _{gs}		-	1.5	-	nC
Gate-Drain Charge	Q _{gd}		-	3	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 3)	V _{SD}	V _{GS} =0V, I _S =2.9A	-	-	1.2	V
Diode Forward Current (Note 2)	I _S		-	-	5.8	A

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Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. $R_{\theta JA}$ is measured with the device mounted on 1 in² FR4 board with 2oz. copper, in a still air environment with $T_A=25^\circ\text{C}$, $t \leq 10$ sec. The value in any given application depends on the user's specific board design.
3. Pulse Test: Pulse Width $\leq 300 \mu\text{s}$, Duty Cycle $\leq 2\%$.
4. Guaranteed by design, not subject to production

Typical Electrical and Thermal Characteristics

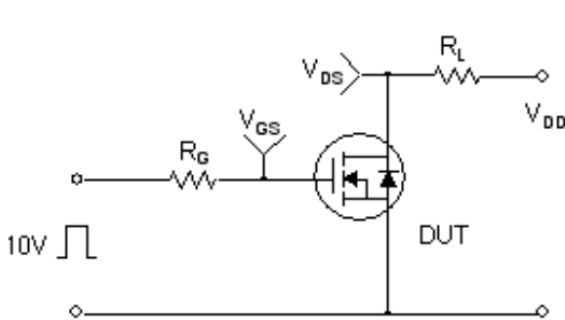


Figure 1 Switching Test Circuit

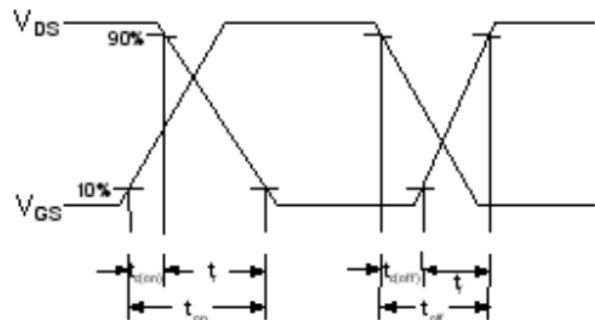


Figure 2 Switching Waveforms

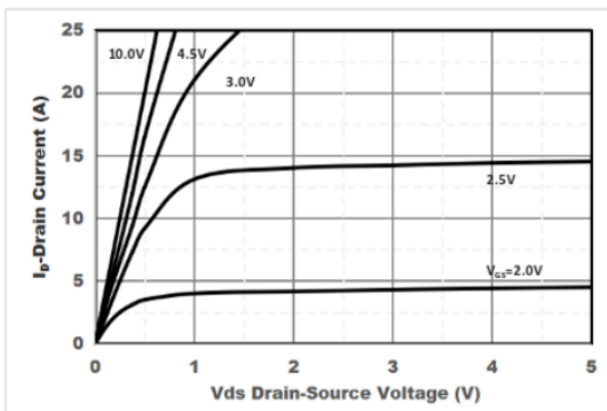


Figure 3 Output Characteristics

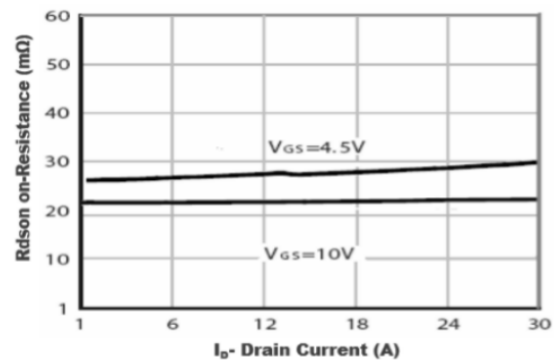


Figure 4 Drain-Source On-Resistance

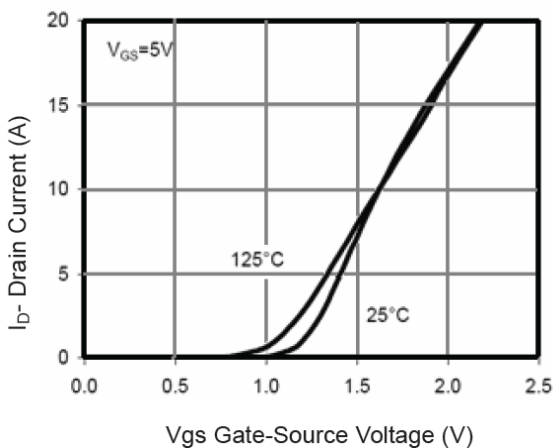


Figure 5 Transfer Characteristics

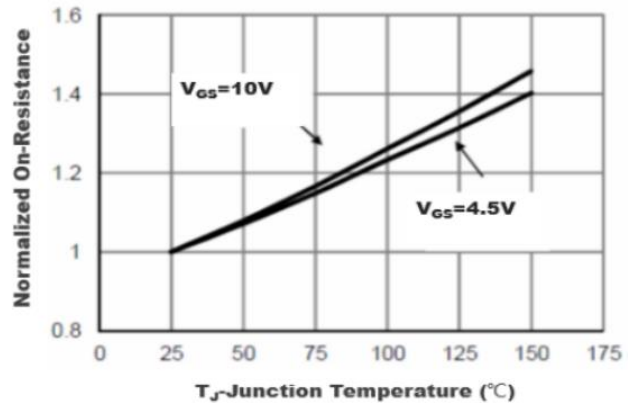


Figure 6 Drain-Source On-Resistance

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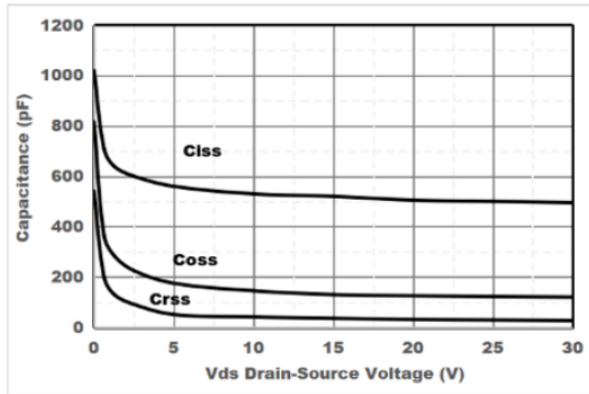


Figure 7 Capacitance vs Vds

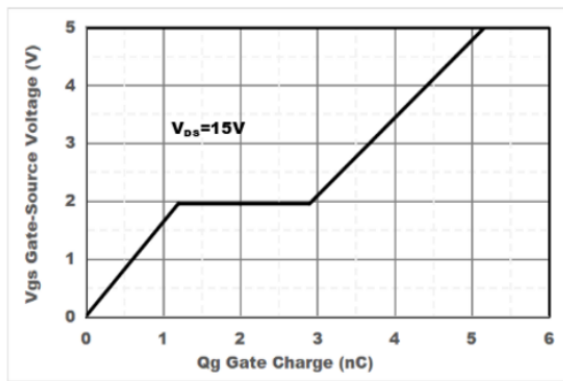


Figure 8 Gate Charge

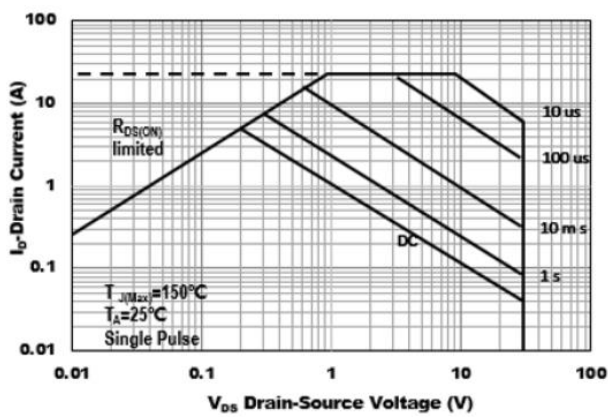
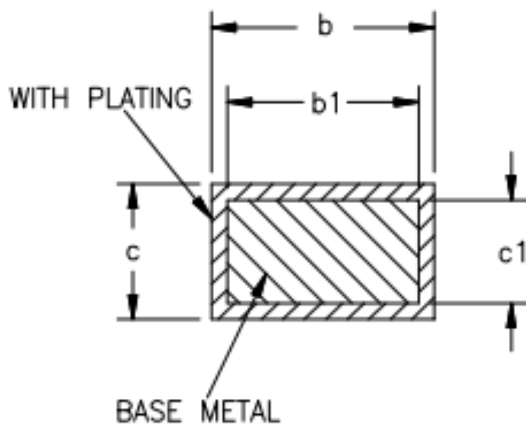
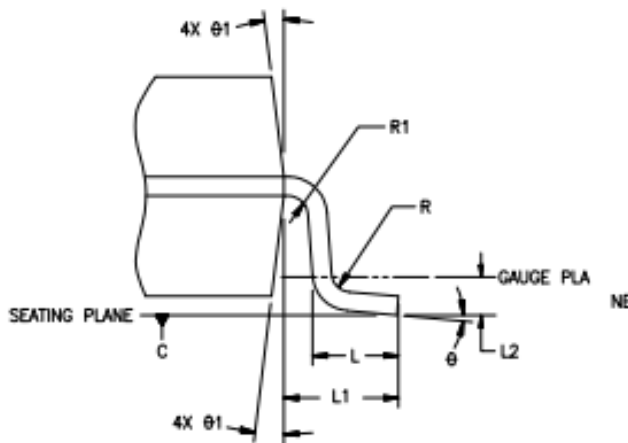
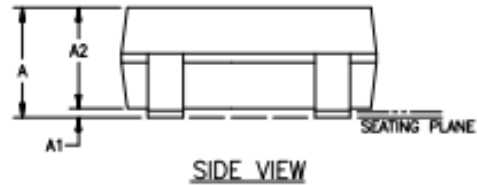
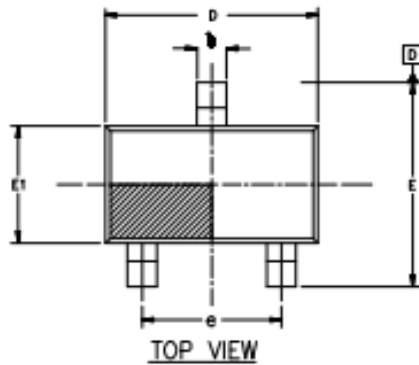


Figure 9 Safe Operation Area

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Package Information



SYMBOL	MIN	NOM	MAX
A	—	—	1.35
A1	0	—	0.15
A2	1.0	1.1	1.2
b	0.35	—	0.45
b1	0.32	—	0.38
c	0.14	—	0.20
c1	0.14	0.15	0.16
D	2.82	2.92	3.02
E	2.60	2.80	3.00
E1	1.526	1.626	1.726
e	1.8	1.9	2.0
L	0.35	0.45	0.6
L1	0.6REF		
L2	0.25REF		
R	0.1	—	—
R1	0.1	—	0.25
Ø	0°	4°	8°
Ø1	5°	10°	15°

NOTES:
 1. ALL DIMENSIONS REFER TO JEDEC STANDARD MO-178
 2. DIMENSION D DOES NOT INCLUDE MOLD FLASH
 3. DIMENSION E1 DOES NOT INCLUDE MOLD FLASH
 4. FLASH OR PROTRUSION SHALL NOT EXCEED 0.25mm PER SIDE.

Consonance Electronics does not assume any responsibility for use of any circuitry described. Consonance reserves the right to change the circuitry and specifications without notice at any time.