CMN2006U
N-Channel 20V (D-S) Power MOSFET

Description

The CMN2006U is the N-Channel enhancement mode power field effect transistors with high cell density, high voltage planar technology. This high density process and design have been optimized switching performance and especially tailored to minimize on-state resistance, .

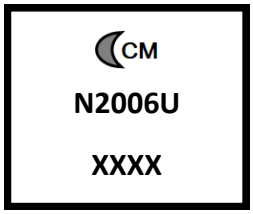
Applications

- AC/DC load switch
- SMPS
- LED power

Features

- VDS: 20V
- ID : 57A
- RDS_{ON} (@VGS=4.5V) : < 6.0mΩ
- RDS_{ON} (@VGS=2.5V) : < 8.8mΩ
- RDS_{ON} (@VGS=1.8V) : < 14.0mΩ
- High density cell design for extremely low RDS_{ON}
- Excellent on-resistance and DC current capability

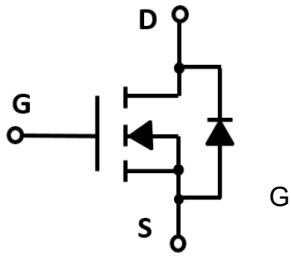
Marking Information



Marking Code = CMN2006U

Date Code = XXXX

Equivalent Circuit and Pin Configuration



TO-252

Ordering Information

Part Number	Packaging	Remark
CMN2006U	2500/Tape & Reel	ROHS

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

Parameter		Symbol	Maximum	Unit
Drain-source Voltage		VDS	20	V
Gate-source Voltage		VGS	±10	V
Continuous Drain Current	Tc=25°C	ID	57	A
	Tc=70°C		36	A
Pulsed Drain Current (1)		IDM	228	A
Total Power Dissipation (2)		P_D @ Tc=25°C	29	W
		P_D @ Tc=100°C	12	W
Thermal Resistance Junction-to-Case (2)		RθJC	4.3	°C/W
Junction and Storage Temperature Range		TJ,TSTG	-55 to +150	°C

Electrical Characteristics (T_C=25 ℃ unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Parameter						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V,I_D=250μA	20			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=20V,V_{GS}=0V,T_C=25°C			1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±10V,V_{DS}=0V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250μA	0.4		1.0	V
Static Drain-Source on-Resistance	$R_{DS(on)}$	V_{GS}=4.5V,I_D=20A		4.5	6.0	mΩ
		V_{GS}=2.5V,I_D=15A		5.5	8.8	
		V_{GS}=1.8V,I_D=10A		8.0	14.0	
Diode Forward Voltage	V_{SD}	I_S=20A,V_{GS}=0V			1.2	V
Maximum Body-Diode Continuous Current	I_S				57	A
Dynamic Parameters						
Input Capacitance	C_{iss}	V_{DS}=10V,V_{GS}=0V,f=1MHz		1980		pF
Output Capacitance	C_{oss}			296		
Reverse Transfer Capacitance	C_{rss}			281		
Switching Parameters						
Total Gate Charge	Q_g	V_{GS}=4.5V,V_{DS}=10V,I_D=15A		26		nC
Gate Source Charge	Q_{gs}			2.8		
Gate Drain Charge	Q_{gd}			7.5		
Turn-on Delay Time	$t_{D(on)}$	V_{GS}=4.5V,V_{DD}=10V, R_L=1Ω, R_{GEN}=3Ω		12		ns
Turn-on Rise Time	t_r			26		
Turn-off Delay Time	$t_{D(off)}$			35		
Turn-off Fall Time	t_f			10		

Noted: (1) Pulse Test: Pulse Width≤300us,Duty cycle ≤2%.

(2) Device mounted on FR-4 PCB , 1 inch x 0.85 inch x 0.062 inch with 2oz. Copper , t≤10s.

Typical Performance Characteristics

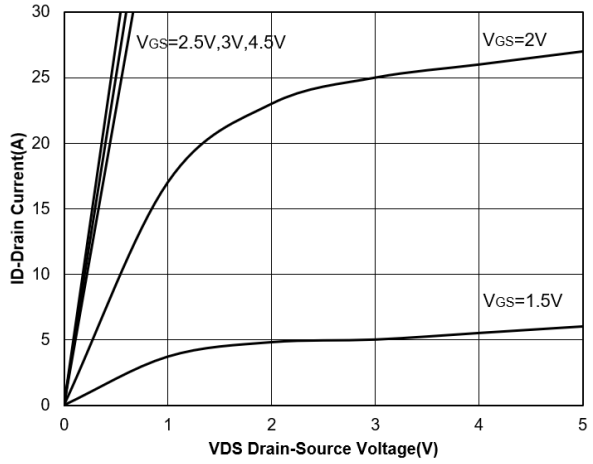


Figure 1. Output Characteristics

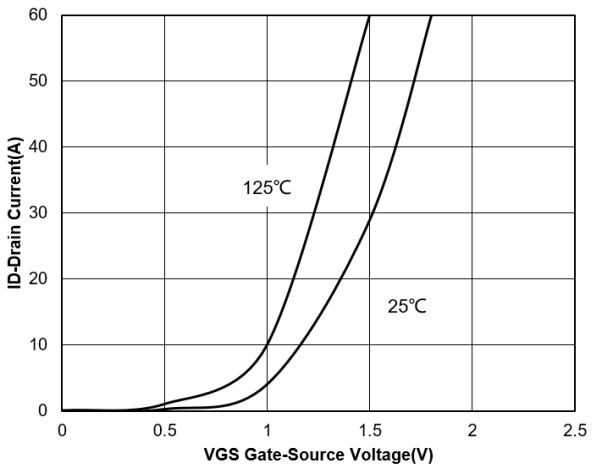


Figure 2. Transfer Characteristics

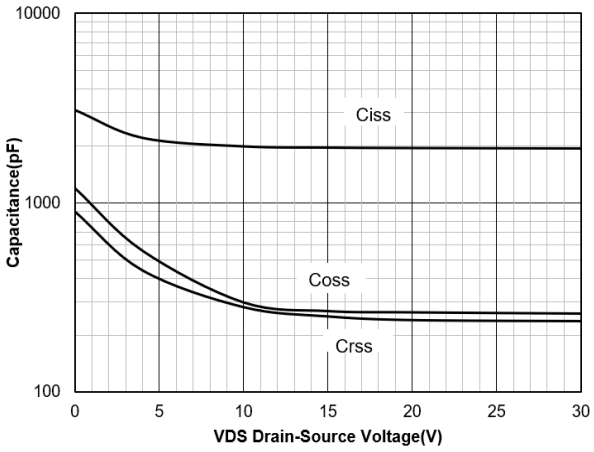


Figure 3. Capacitance Characteristics

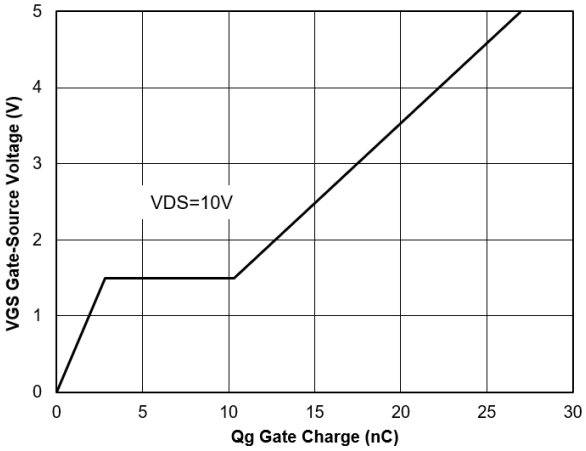


Figure 4. Gate Charge

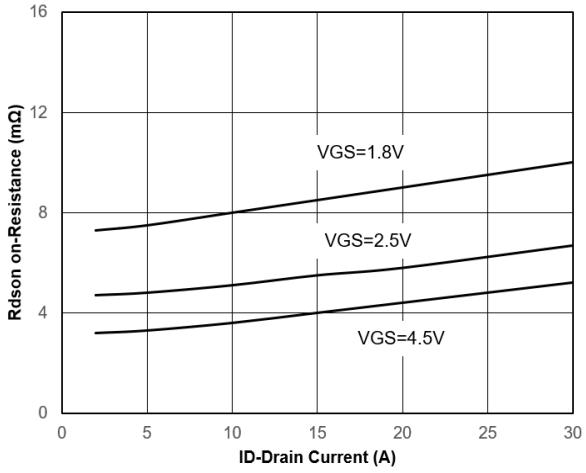


Figure 5. Drain-Source on Resistance

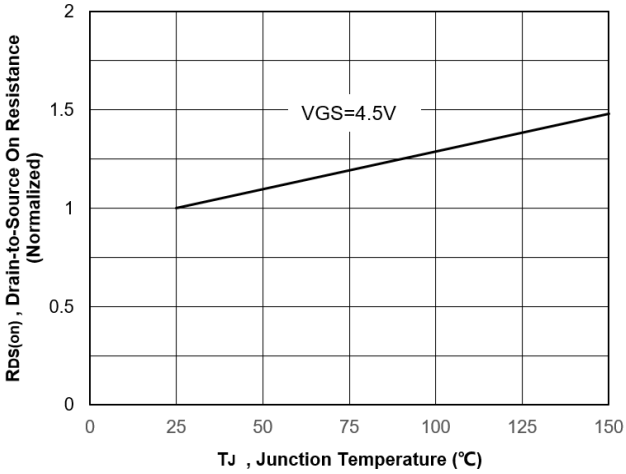


Figure 6. Normalized On-Resistance Vs. Temperature

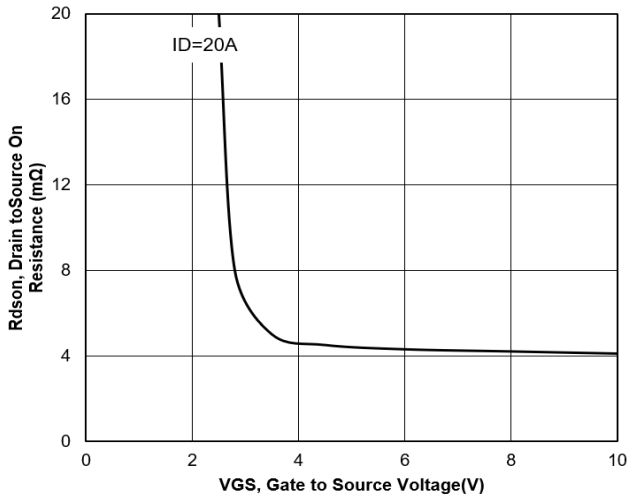


Figure 7. Typical Drain to Source ON Resistance VS Gate Voltage and Drain Current

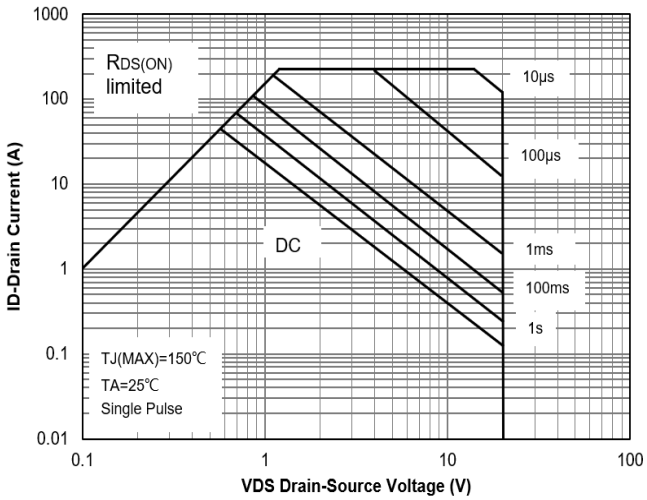


Figure 8. Safe Operation Area

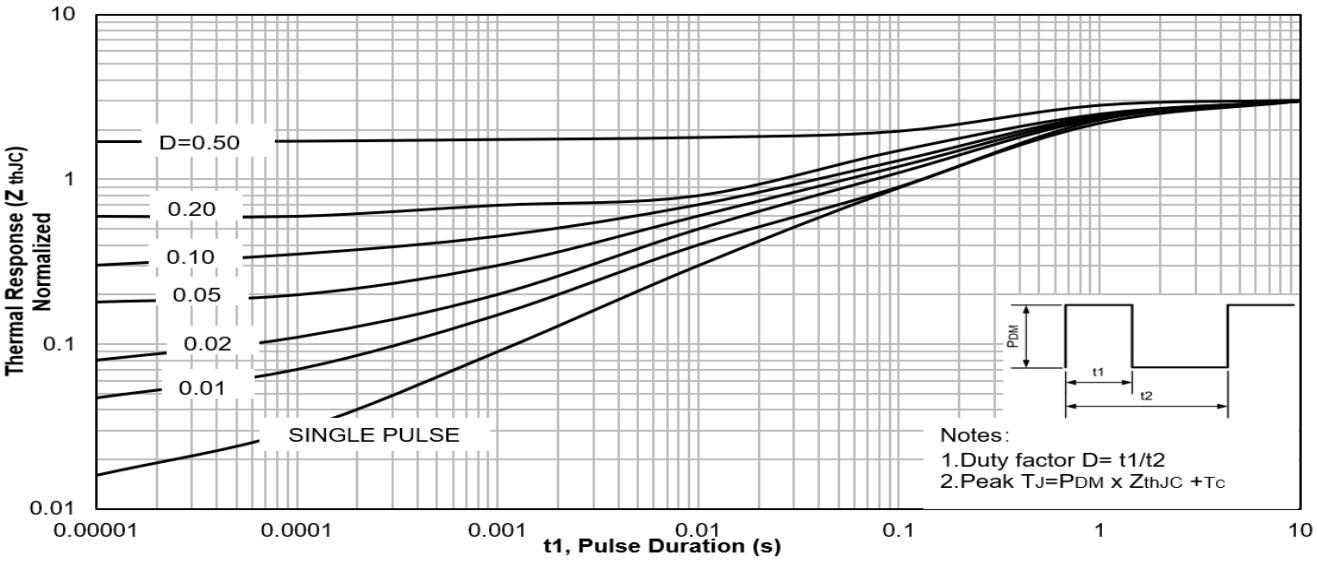


Figure 9. Maximum Effective Transient Thermal Impedance ,Junction-to-Case

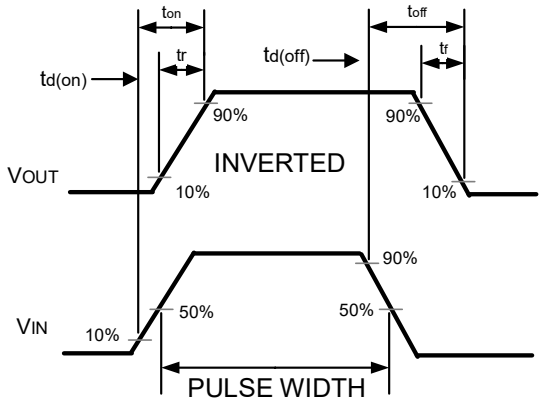
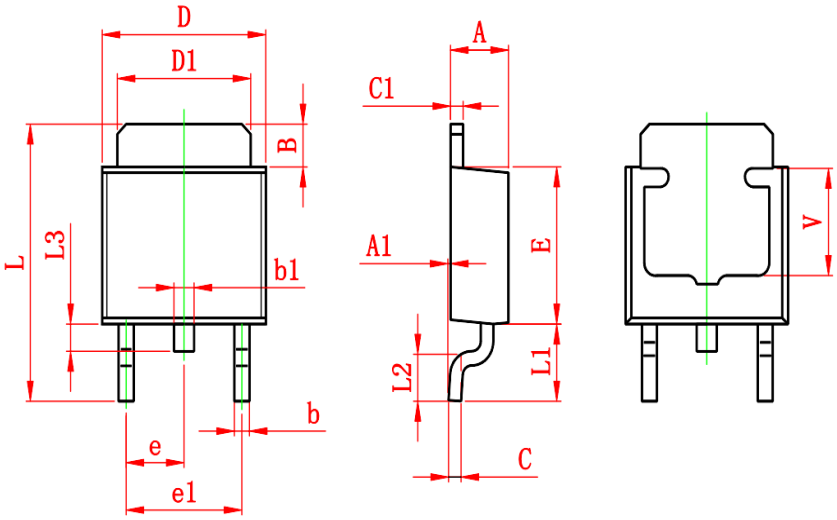


Figure 10. Switching wave

TO-252 Package Outline Drawing



Symbol	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
B	1.350	1.650	0.053	0.065
b	0.500	0.700	0.020	0.028
b1	0.700	0.900	0.028	0.035
c	0.430	0.580	0.017	0.023
c1	0.430	0.580	0.017	0.023
D	6.350	6.650	0.250	0.262
D1	5.200	5.400	0.205	0.213
E	5.400	5.700	0.213	0.224
e	2.300 TYP.		0.091 TYP.	
e1	4.500	4.700	0.177	0.185
L	9.500	9.900	0.374	0.390
L1	2.550	2.900	0.100	0.114
L2	1.400	1.780	0.055	0.070
L3	0.600	0.900	0.024	0.035
V	3.800 REF.		0.150 REF.	

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