

Description

This is 100V 245A N-channel enhancement mode power mosfet in a TO-220 plastic package.

uses 2nd generation power trench mosfet technology that has been especially tailored to minimize the on-state resistance and yet maintain superior switching performance. This device is well suited for high efficiency fast switching applications.

Features

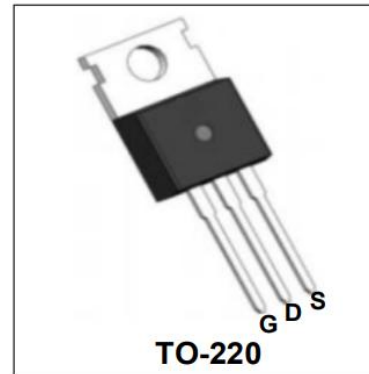
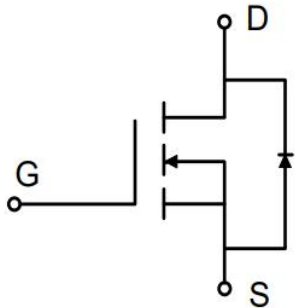
- $V_{DS} = 100V$, $I_D = 245A$ (Silicon Limited)
 $R_{DS(on)} < 2.8m\Omega$ @ $V_{GS} = 10V$
- High Speed Power Switching
- Low $R_{DS(on)}$
- Low Gate Charge
- 100% EAS Guaranteed

Applications

- Hard Switching and High Speed Circuit
- DC/DC Converters
- Synchronous Rectification in SMPS

V_{DSS}	$R_{DS(on)}$	I_D
100 V	2.8 m Ω	245 A

Equivalent Circuit & Pinning



Absolute Maximum Ratings(Ta=25°C)

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current ¹ (Silicon Limited)	T _C =25°C	I_D	245	A
	T _C =100°C		170	
	Continuous Drain Current ¹ (Package Limited)		175	
Pulsed Drain Current ²		I_{DM}	780	A
Single Pulse Avalanche Energy ³		EAS	845	mJ
Avalanche Current		I_{AS}	65	A
Total Power Dissipation ⁴	T _C =25°C	P_D	278	W
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-55 to 150	°C

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal Resistance from Junction-to-Ambient ¹	R_{θJA}	61	°C/W
Thermal Resistance from Junction-to-Case ¹	R_{θJC}	0.45	°C/W

Electrical Characteristics(Ta=25°C)

Parameter		Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics							
Drain-Source Breakdown Voltage		V _{(BR)DSS}	V _{GS} = 0V, I _D = 250μA	100	-	-	V
Gate-Body Leakage Current		I _{GSS}	V _{DS} = 0V, V _{GS} = ±20V	-	-	±100	nA
Zero Gate Voltage Drain Current	T _J =25°C	I _{DSS}	V _{DS} = 100V, V _{GS} = 0V	-	-	10	μA
	T _J =100°C			-	-	100	
Gate-Threshold Voltage		V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250μA	2	3	4	V
Drain-Source on-Resistance ²		R _{DS(on)}	V _{GS} = 10V, I _D = 20A	-	2.4	2.8	mΩ
Forward Transconductance ²		g _{fs}	V _{DS} = 5V, I _D = 20A	-	70	-	S
Dynamic Characteristics							
Input Capacitance		C _{iss}	V _{DS} = 50V, V _{GS} =0V, f =1MHz	-	7735	-	pF
Output Capacitance		C _{oss}		-	1190	-	
Reverse Transfer Capacitance		C _{rss}		-	25	-	
Switching Characteristics							
Gate Resistance		R _g	V _{GS} = 0V, V _{DS} = 0V, f =1MHz	-	1.4	-	Ω
Total Gate Charge		Q _g	V _{GS} = 10V, V _{DS} = 50V, I _D =20A	-	98	-	nC
Gate-Source Charge		Q _{gs}		-	20	-	
Gate-Drain Charge		Q _{gd}		-	18	-	
Turn-on Delay Time		t _{d(on)}	V _{GS} =10V, V _{DS} =50V, R _G = 10Ω, I _D = 20A	-	25	-	nS
Rise Time		t _r		-	20	-	
Turn-off Delay Time		t _{d(off)}		-	50	-	
Fall Time		t _f		-	11	-	
Drain-Source Body Diode Characteristics							
Diode Forward Voltage ²		V _{SD}	I _S = 20A, V _{GS} = 0V	-	-	1.2	V
Continuous Source Current ^{1,5}		I _S	V _G = V _D = 0V , Force Current	-	-	245	A
Reverse Recovery Time		t _{rr}	V _R = 50V, I _F = 20A, dI/dt= 500A/μs	-	60	-	nS
Reverse Recovery Charge		Q _{rr}		-	438	-	nC

Notes:

- 1.The data tested by surface mounted on a 1 inch² FR-4 board with 20Z copper.
- 2.The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
3. The EAS data shows Max. rating . The test condition is $V_{DD}=25V, V_{GS}=10V, L=0.4mH, I_{AS}=65A$
4. The power dissipation is limited by 150°C junction temperature
5. The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

Electrical Characteristic Curve

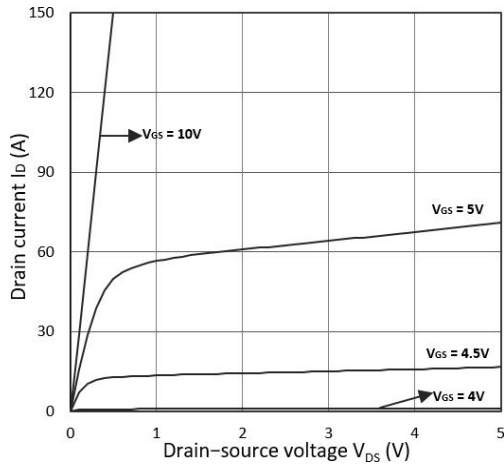


Figure 1. Output Characteristics

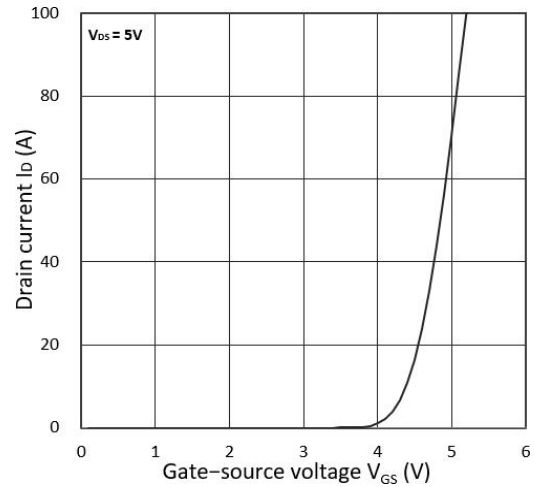


Figure 2. Transfer Characteristics

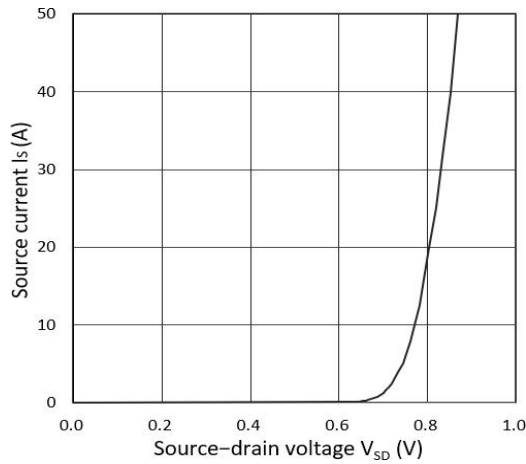


Figure 3. Forward Characteristics of Reverse

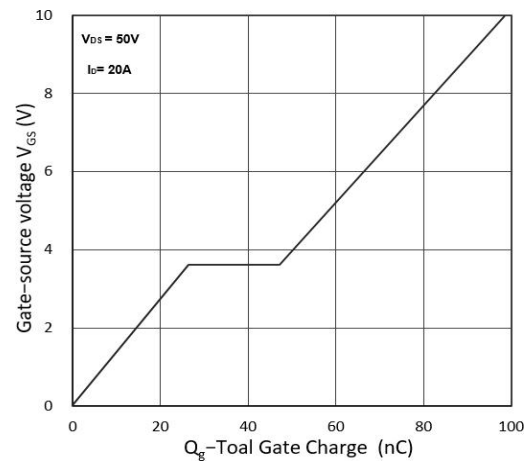


Figure 4. Gate Charge Characteristics

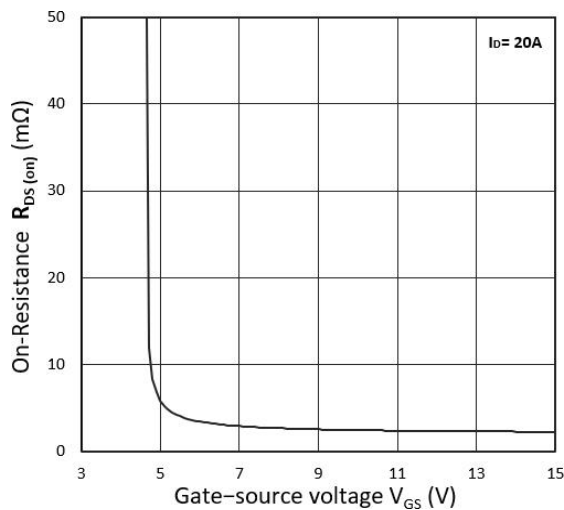


Figure 5. $R_{DS(on)}$ vs. V_{GS}

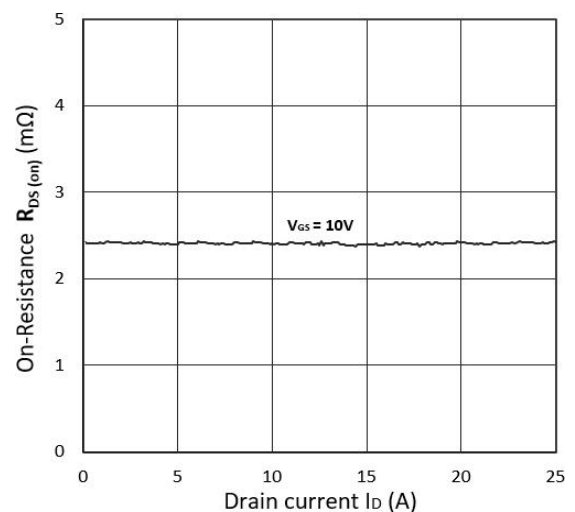


Figure 6. $R_{DS(on)}$ vs. I_D

Electrical Characteristic Curve

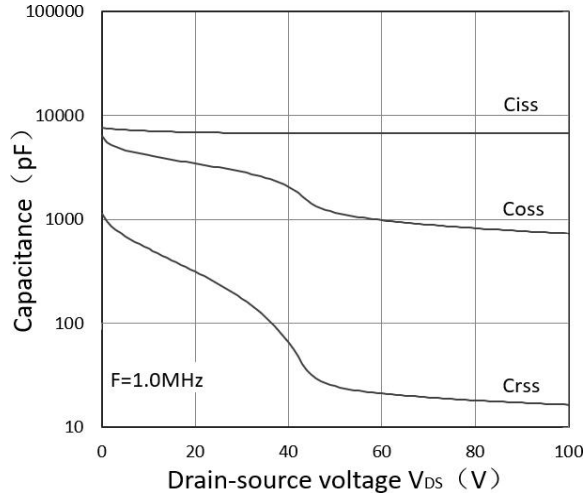


Figure 7. Capacitance Characteristics

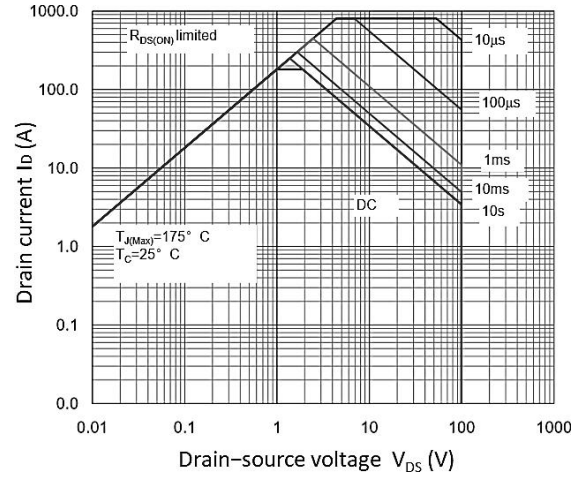


Figure 8. Safe Operating Area

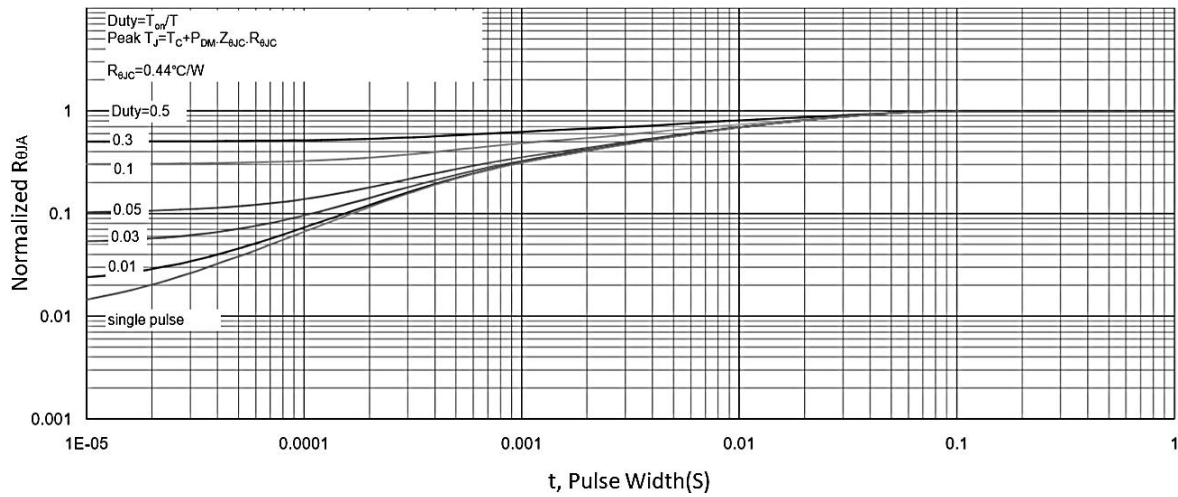


Figure 9. Normalized Maximum Transient Thermal Impedance

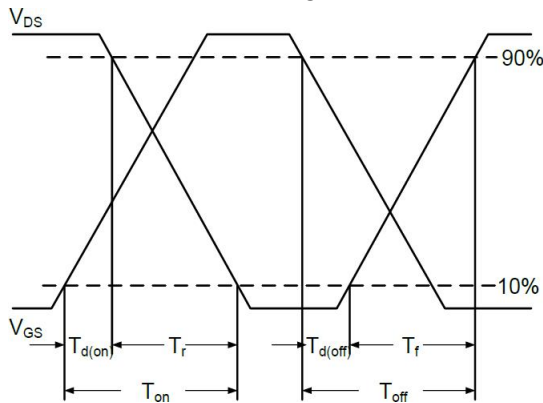


Figure 10. Switching Time Waveform

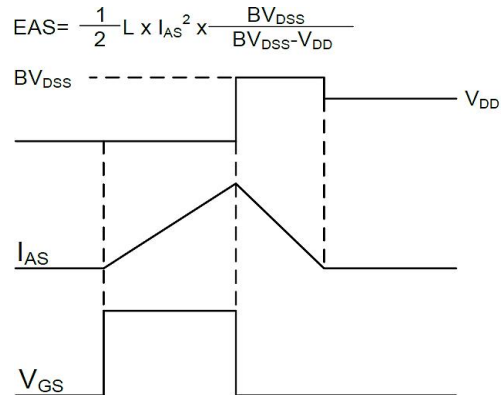
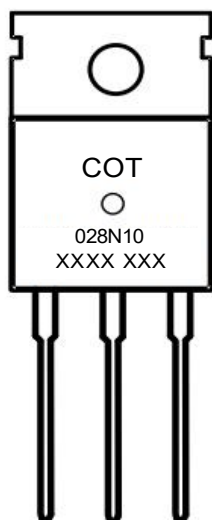


Figure 11. Unclamped Inductive Switching

Marking Instructions

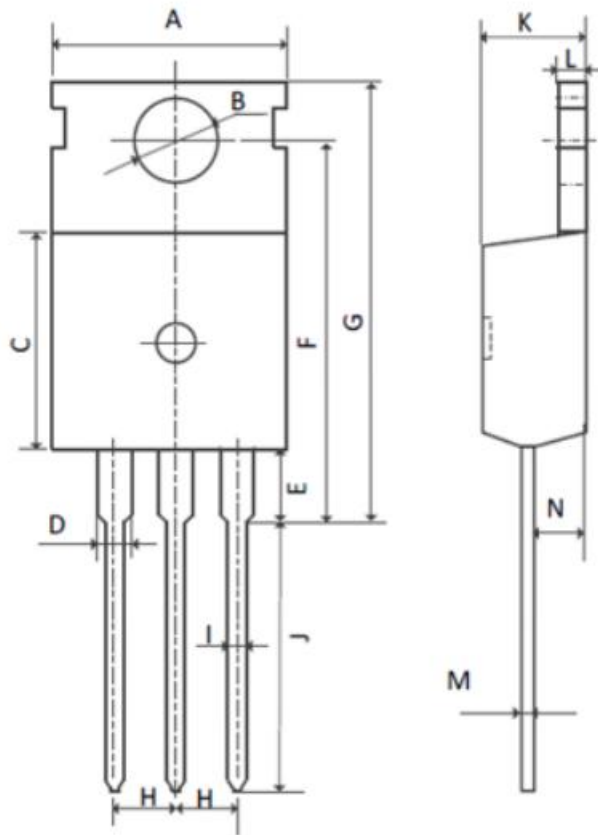


028N10 = Device code
XXXX XXX= Date code

Ordering Information

Part	Package	Marking	Packing method
CT028N10RA	TO-220	028N10	Tube

Mechanical Dimensions for TO-220



COMMON DIMENSIONS

SYMBOL	MM	
	MIN	MAX
A	9.70	10.30
B	3.40	3.80
C	8.80	9.40
D	1.17	1.47
E	2.60	3.50
F	15.10	16.70
G	19.55MAX	
H	2.54REF	
I	0.70	0.95
J	9.35	11.00
K	4.30	4.77
L	1.20	1.45
M	0.40	0.65
N	2.20	2.60