

Description

This is 100V 70A N-channel enhancement mode power mosfet in a TO-220F plastic package.

uses advanced 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

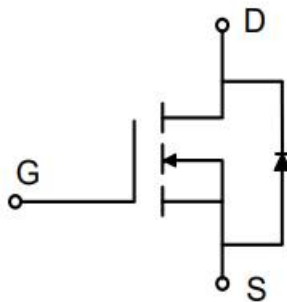
- $V_{DS} = 100V$, $I_D = 70A$
- $R_{DS(on)} < 5m\Omega$ @ $V_{GS} = 10V$
- Green Device Available
- Low Gate Charge
- 100% EAS Guaranteed

Applications

- Power Management Switches
- DC/DC Converter
- LED Backlighting

V_{DSS}	$R_{DS(on)}$	I_D
100 V	4.3 m Ω	70 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	$T_C=25^{\circ}\text{C}$	I_D	70	A
	$T_C=100^{\circ}\text{C}$		44.3	
Pulsed Drain Current ¹		I_{DM}	280	A
Single Pulse Avalanche Energy ²		E_{AS}	320	mJ
Total Power Dissipation	$T_C=25^{\circ}\text{C}$	P_D	50	W
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-55 to 150	$^{\circ}\text{C}$

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal Resistance from Junction-to-Ambient ³	$R_{\theta JA}$	60	$^{\circ}\text{C/W}$
Thermal Resistance from Junction-to-Case	$R_{\theta JC}$	2.5	$^{\circ}\text{C/W}$

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	-	-	1	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 ⁴		R _{DS(on)}	V _{GS} = 10V, I _D = 20A	-	4.3	5	mΩ
Forward Transconductance ⁴		g _{fs}	V _{DS} = 10V, I _D = 20A	-	60	-	S
Dynamic Characteristics ⁵							
Input Capacitance		C _{iss}	V _{DS} = 50V, V _{GS} =0V, f =1MHz	-	5350	-	pF
Output Capacitance		C _{oss}		-	740	-	
Reverse Transfer Capacitance		C _{rss}		-	21	-	
Gate Resistance		R _g	f =1MHz	-	1.3	-	Ω
Switching Characteristics ⁵							
Total Gate Charge		Q _g	V _{GS} = 10V, V _{DS} = 50V, I _D =20A	-	98.4	-	nC
Gate-Source Charge		Q _{gs}		-	21.6	-	
Gate-Drain Charge		Q _{gd}		-	32.4	-	
Turn-on Delay Time		t _{d(on)}	V _{GS} =10V, V _{DD} =50V, R _G = 3Ω, I _D = 20A	-	21.2	-	ns
Rise Time		t _r		-	35.8	-	
Turn-off Delay Time		t _{d(off)}		-	51	-	
Fall Time		t _f		-	32	-	
Body Diode Reverse Recovery Time		t _{rr}	I _F = 20A, dI/dt=100A/μs	-	58.7	-	ns
Body Diode Reverse Recovery Charge		Q _{rr}		-	81.9	-	nC
Drain-Source Body Diode Characteristics							
Diode Forward Voltage ⁴		V _{SD}	I _S = 20A, V _{GS} = 0V	-	-	1.2	V
Continuous Source Current	T _C =25°C	I _S	-	-	-	70	A

Notes:

- 1.Repetitive rating, pulse width limited by junction temperature $T_J(MAX) = 150^\circ C$.
- 2.The EAS data shows Max. rating . The test condition is $V_{DD} = 35V, V_{GS} = 10V, L = 0.4mH, I_{AS} = 40A$.
- 3.The data tested by surface mounted on a 1 inch² FR-4 board with 20Z copper, The value in any given application depends on the user's specific board design.
- 4.The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
- 5.This value is guaranteed by design hence it is not included in the production test

Electrical Characteristic Curve

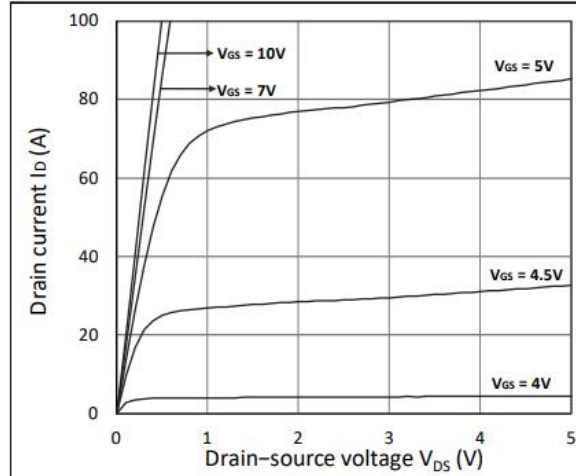


Figure 1. Output Characteristics

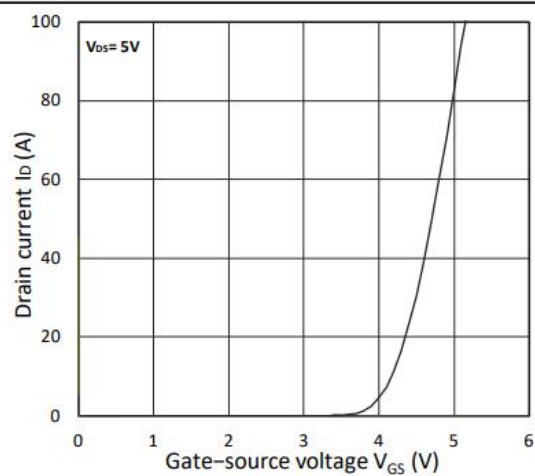


Figure 2. Transfer Characteristics

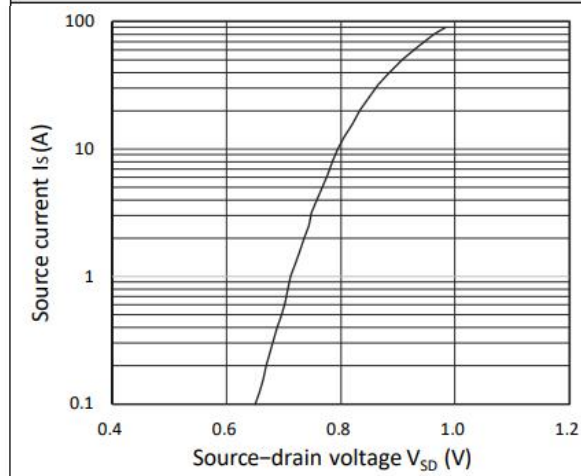


Figure 3. Forward Characteristics of Reverse

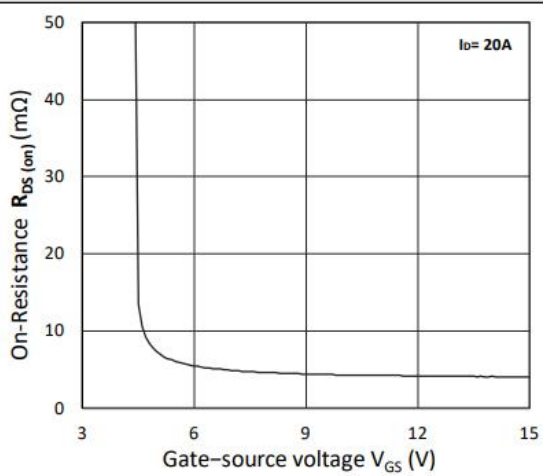


Figure 4. $R_{DS(ON)}$ vs. V_{GS}

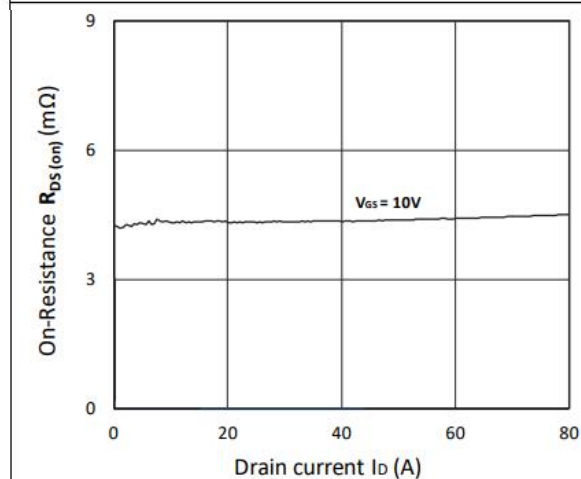


Figure 5. $R_{DS(ON)}$ vs. I_D

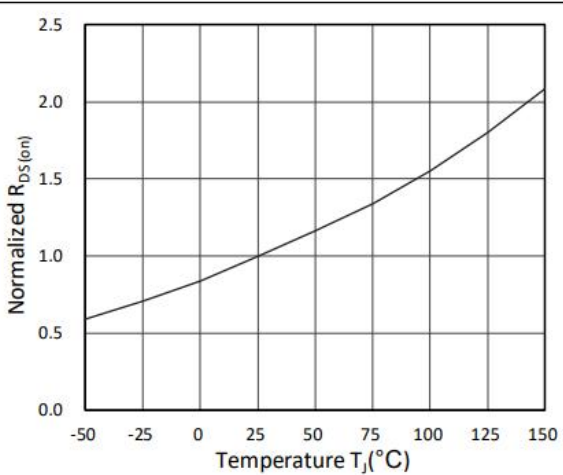


Figure 6. Normalized $R_{DS(ON)}$ vs. Temperature

Electrical Characteristic Curve

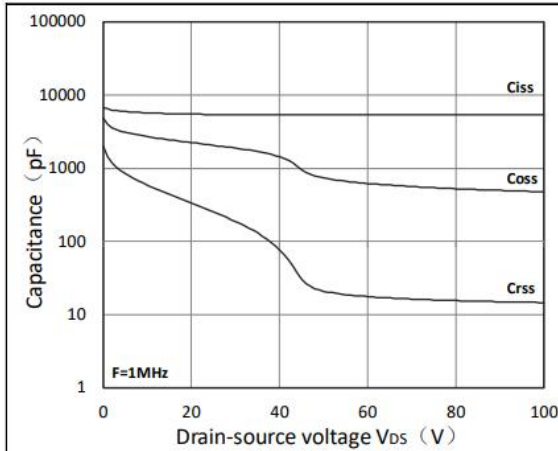


Figure 7. Capacitance Characteristics

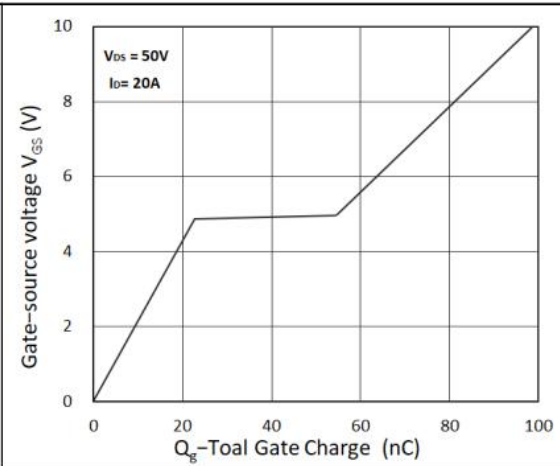


Figure 8. Gate Charge Characteristics

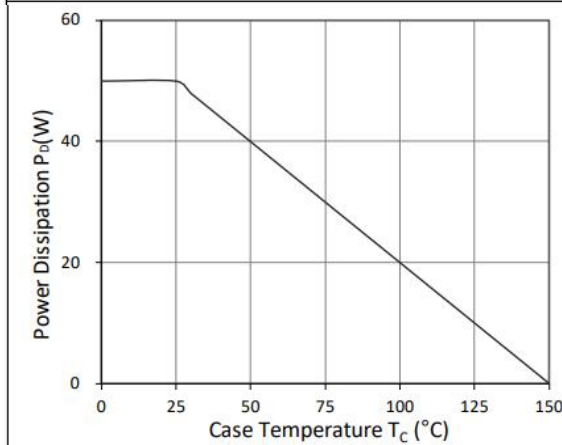


Figure 9. Power Dissipation

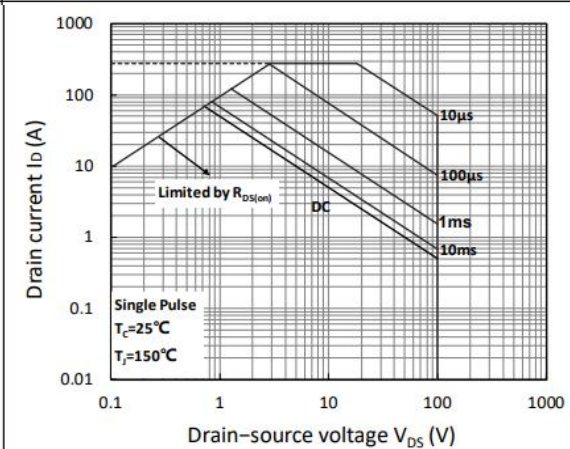


Figure 10. Safe Operating Area

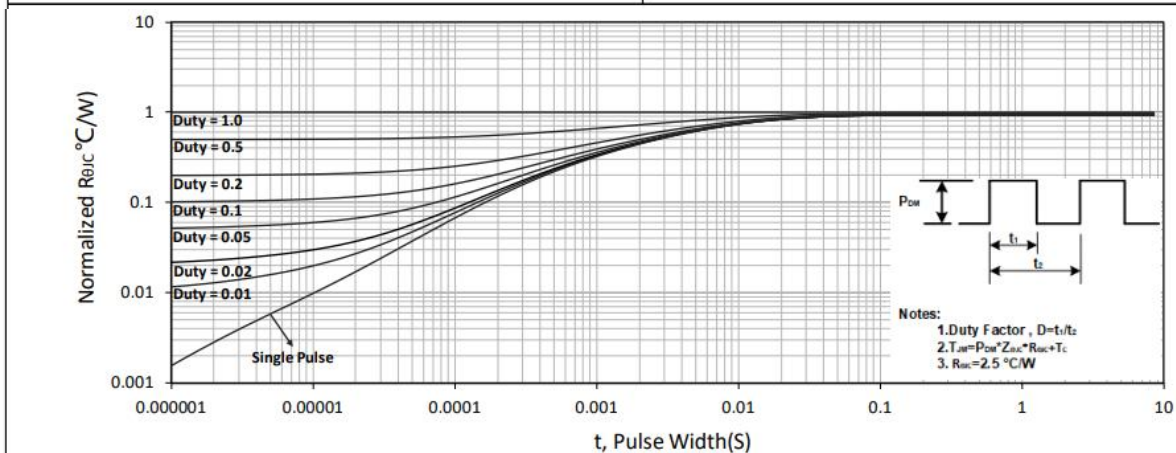


Figure 11. Normalized Maximum Transient Thermal Impedance

Electrical Characteristic Curve

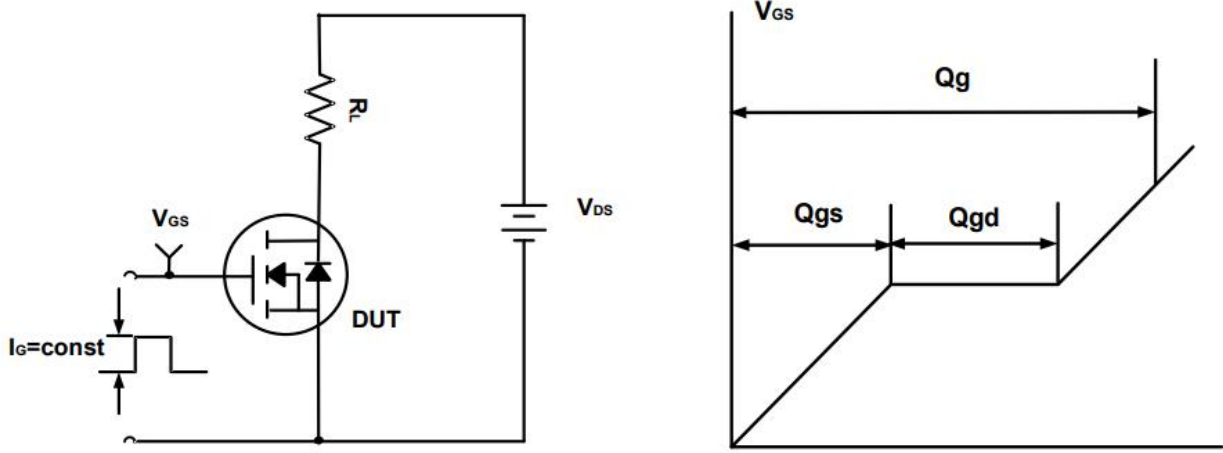


Figure A. Gate Charge Test Circuit & Waveforms

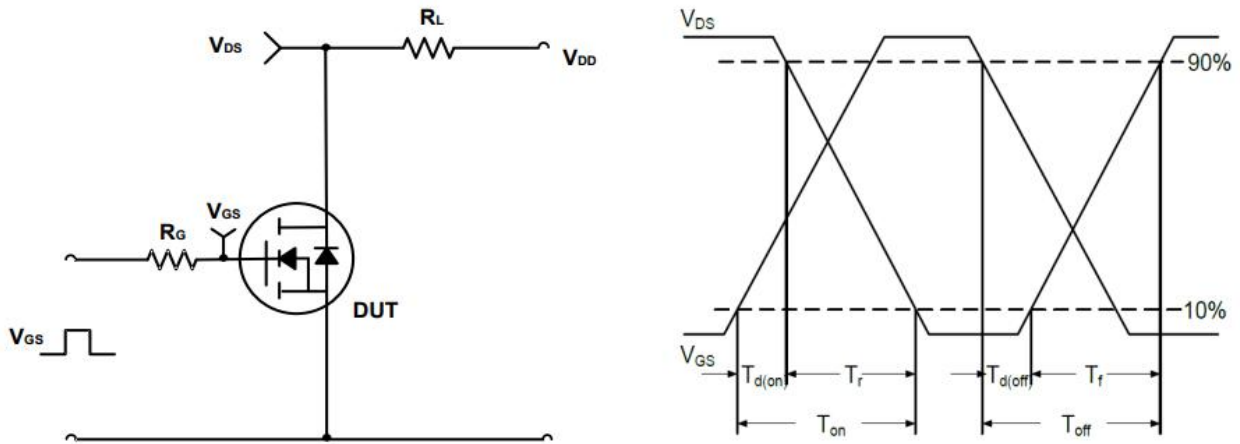


Figure B. Switching Test Circuit & Waveforms

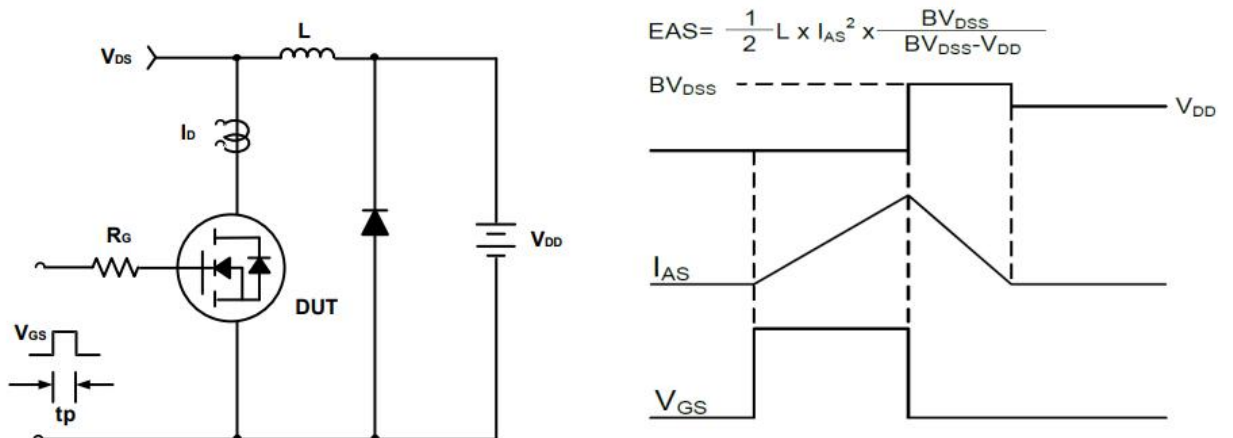
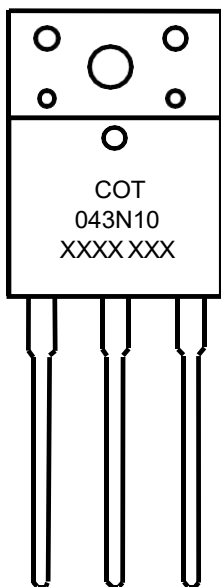


Figure C. Unclamped Inductive Switching Circuit & Waveforms

Marking Instructions

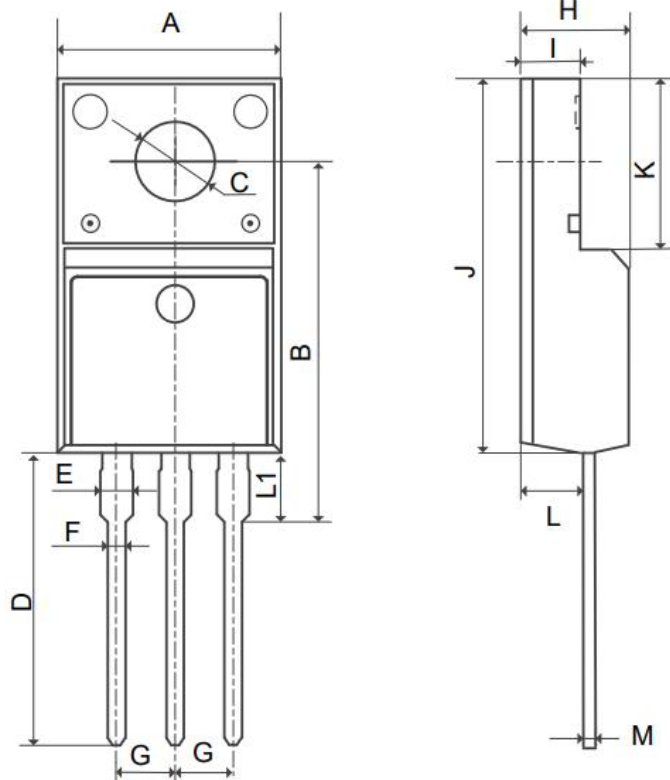


043N10 = Device code
XXXX XXX= Date code

Ordering Information

Part	Package	Marking	Packing method
CT043N10FA	TO-220F	043N10	Tube

Mechanical Dimensions for TO-220F



COMMON DIMENSIONS

SYMBOL	MM	
	MIN	MAX
A	9.96	10.36
B	15.00	16.25
C	3.03	3.38
D	12.64	13.38
E	1.18	1.58
F	0.65	0.95
G	2.54REF	
H	4.50	4.90
I	2.34	2.74
J	15.57	16.17
K	6.70REF	
L	2.56	2.96
M	0.40	0.65
L1	2.85	3.50