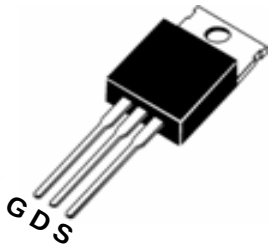
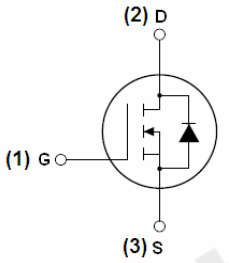
30V-Channel Mosfet

PIN Connection TO-220AB



Features

- 30V/100A
  RDS(ON)= 5.8mΩ@ VGS=10V
  RDS(ON)= 9mΩ@ VGS=4.5V
- Lead free and Green Device Available



Application

- Load Switch

Marking Diagram

Y = Year
A = Assembly Location
WW = Work Week
FIR100N03P = Specific Device Code

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

Symbol	Parameter		Maximum	Unit
V_{DSS}	Drain-to-Source Voltage		30	V
V_{GSS}	Gate-to-Source Voltage		±20	V
I_D	Continuous Drain Current	T_C=25°C	100	A
		T_C=100°C	60	A
I_{DP}	Pulsed Drain Current	T_C=25°C	140	A
PD	Maximum Power Dissipation	T_C=25°C	60	W
		T_C=100°C	24	
T_J, T_{STG}	Junction & Storage Temperature Range		-55~150	°C

Thermal Characteristics

Symbol	Parameter	Typical	Unit
Rθjc	Thermal Resistance-Junction to Case	2.1	°C/W
Rθja	Thermal Resistance-Junction to Ambient	62.5	

Electrical Characteristics (TA=25°C unless otherwise noted)

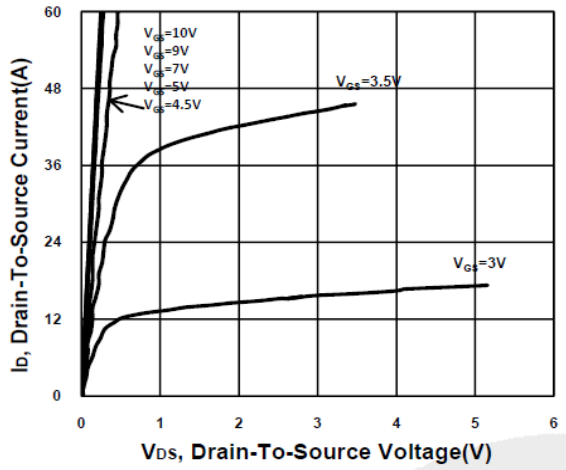
Symbol	Parameter	Test Conditions	Min.	Typ	Max.	Unit
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V,I_D=250uA	30	—	—	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=20V,V_{GS}=0V	—	—	1	uA
		T_J=85°C	—	—	10	
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250uA	1	1.7	3	V
I_{GSS}	Gate Leakage Current	V_{GS}=±20V, V_{DS}=0V	—	—	±100	nA
$R_{DS(on)}$[1]	Drain-Source On-Resistance	V_{GS}=10V, I_D=20A		4.2	5.8	mΩ
		V_{GS}=4.5V, I_D=20A	—	7.5	9	
Diode Characteristics						
V_{SD}[1]	Diode Forward Voltage	I_{SD}=20A,V_{GS}=0V	—	0.9	1.3	V
I_S	Diode Continuous Forward Current				78	A
t_{rr}	Reverse Recovery Time	I_F=20A,	—	35		ns
Q_{rr}	Reverse Recovery Charge	dI/dt=100A/us	—	23		nC
Dynamic Characteristics[2]						
R_G	Gate Resistance	V_{GS}=0V, V_{DS}=0V, Frequency=1MHz	—	1.3	—	Ω
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=30V Frequency=1MHz	—	2250		pF
C_{oss}	Output Capacitance		—	235		
C_{rss}	Reverse Transfer Capacitance		—	215		
$t_{d(on)}$	Turn-On Delay Time	V_{DD}=12.5V, R_L=30Ω I_D=1A, V_{GS}=10V R_G=6Ω	—	16		ns
t_r	Turn-On Rise Time		—	15		
$t_{d(off)}$	Turn-Off Delay Time		—	55		
t_f	Turn-Off Fall Time		—	25		
Gate Charge Characteristics[2]						
Q_g	Total Gate Charge	V_{DS}=12.5V,V_{GS}=10V I_D=20A	—	43		nC
Q_{gs}	Gate-to-Source Charge		—	7.5		
Q_{gd}	Gate-to-Drain Charge		—	10.6		

Note: 1: Pulse test; pulse width ≦ 300ns, duty cycle ≦ 2%.

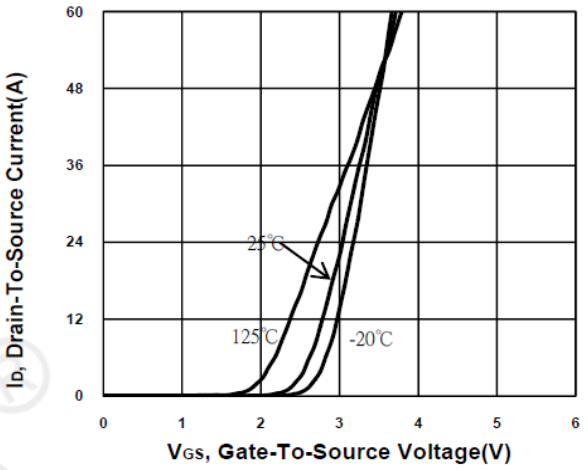
2: Guaranteed by design, not subject to production testing.

Typical Operating Characteristics

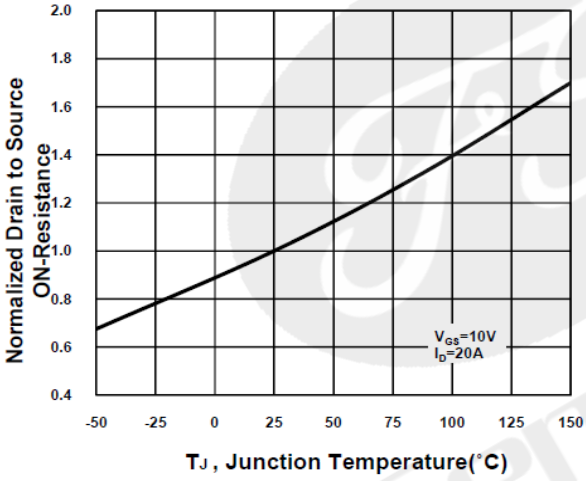
Output Characteristics



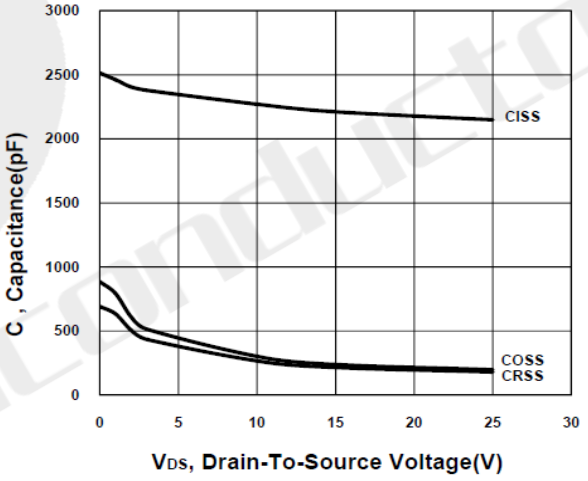
Transfer Characteristics



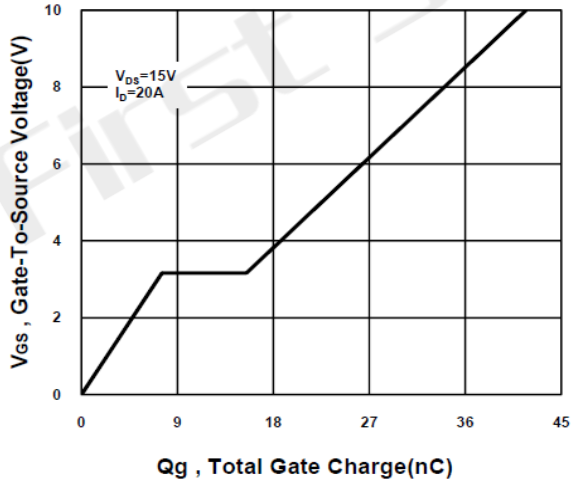
On-Resistance VS Temperature



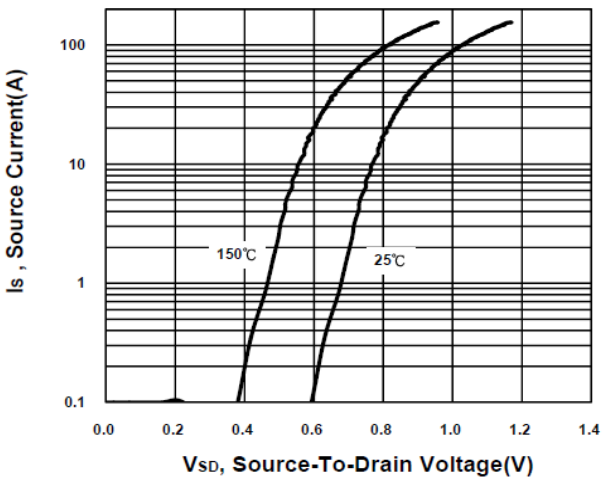
Capacitance Characteristic



Gate charge Characteristics

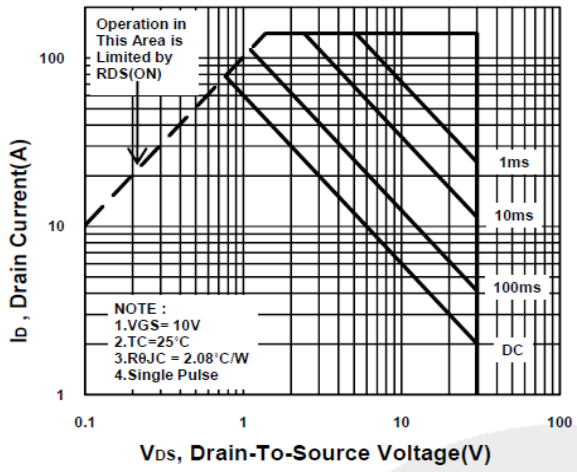


Source-Drain Diode Forward Voltage

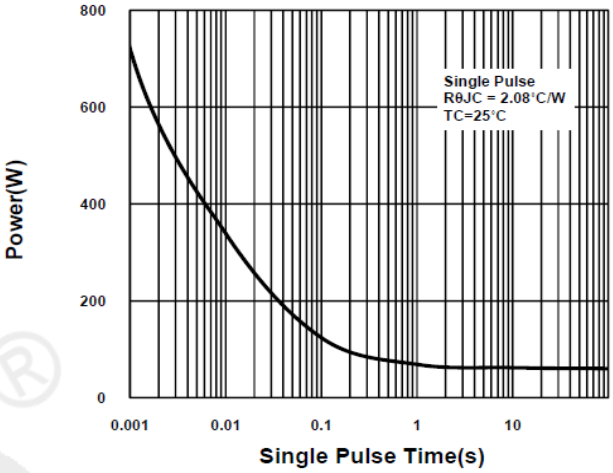


Typical Operating Characteristics

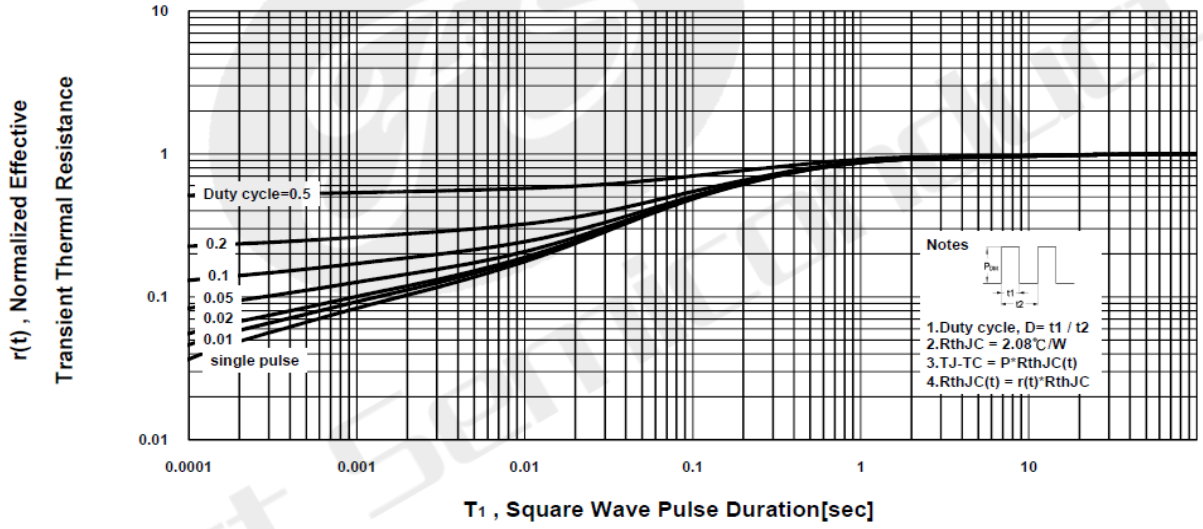
Safe Operating Area



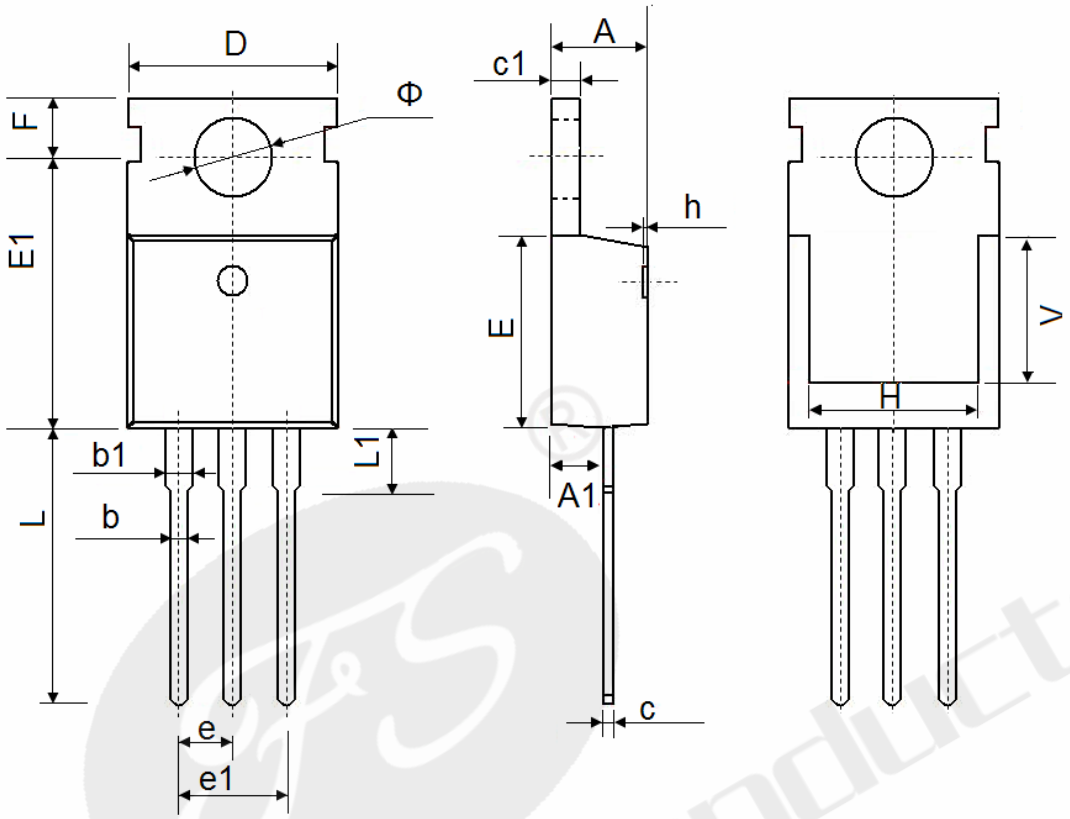
Single Pulse Maximum Power Dissipation



Transient Thermal Response Curve



TO-220AB Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.400	4.600	0.173	0.181
A1	2.250	2.550	0.089	0.100
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.330	0.650	0.013	0.026
c1	1.200	1.400	0.047	0.055
D	9.910	10.250	0.390	0.404
E	8.9500	9.750	0.352	0.384
E1	12.650	12.950	0.498	0.510
e	2.540 TYP.		0.100 TYP.	
e1	4.980	5.180	0.196	0.204
F	2.650	2.950	0.104	0.116
H	7.900	8.100	0.311	0.319
h	0.000	0.300	0.000	0.012
L	12.900	13.400	0.508	0.528
L1	2.850	3.250	0.112	0.128
V	7.500 REF.		0.295 REF.	
Φ	3.400	3.800	0.134	0.150

Declaration

- FIRST reserves the right to change the specifications, the same specifications of products due to different packaging line mold, the size of the appearance will be slightly different, shipped in kind, without notice! Customers should obtain the latest version information before ordering, and verify whether the relevant information is complete and up-to-date.
- Any semiconductor product under certain conditions has the possibility of failure or failure,The buyer has the responsibility to comply with safety standards and take safety measures when using FIRST products for system design and manufacturing,To avoid To avoid potential failure risks, which may cause personal injury or property damage!
- Product promotion endless, our company will wholeheartedly provide customers with better products!

ATTACHMENT

Revision History

Date	REV	Description	Page
2018.01.01	1.0	Initial release	