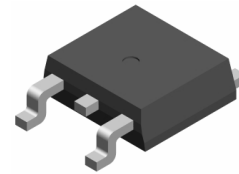




PIN Connection TO-252

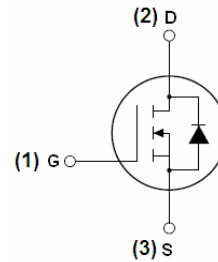
Features

- 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
- FIR100N03L = Specific Device Code

Absolute Maximum Ratings (T<sub>A</sub>=25°C unless otherwise noted)

Symbol	Parameter	Maximum	Unit
V <sub>DSS</sub>	Drain-to-Source Voltage	30	V
V <sub>GSS</sub>	Gate-to-Source Voltage	±20	V
I <sub>D</sub>	Continuous Drain Current	T <sub>C</sub> =25°C	100
		T <sub>C</sub> =100°C	60
I <sub>DP</sub>	Pulsed Drain Current	T <sub>C</sub> =25°C	140
PD	Maximum Power Dissipation	T <sub>C</sub> =25°C	60
		T <sub>C</sub> =100°C	24
T <sub>J</sub> , T <sub>STG</sub>	Junction & Storage Temperature Range	-55~150	°C

Thermal Characteristics

Symbol	Parameter	Typical	Unit
Rθ <sub>jc</sub>	Thermal Resistance-Junction to Case	2.1	°C/W
Rθ <sub>ja</sub>	Thermal Resistance-Junction to Ambient	62.5	

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

Symbol	Parameter	Test Conditions	Min.	Typ	Max.	Unit
<b>Static Characteristics</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	30	—	—	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=20V, V_{GS}=0V$	—	—	1	uA
		$T_J=85^\circ C$	—	—	10	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	1	1.7	3	V
$I_{GSS}$	Gate Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	—	—	$\pm 100$	nA
$R_{DS(on)}^1$	Drain-Source On-Resistance	$V_{GS}=10V, I_D=20A$	—	4.2	5.8	m $\Omega$
		$V_{GS}=4.5V, I_D=20A$	—	7.5	9	
<b>Diode Characteristics</b>						
$V_{SD}^1$	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	$I_F=20A,$ $di/dt=100A/\mu s$	—	35		ns
$Q_{rr}$	Reverse Recovery Charge		—	23		nC
<b>Dynamic Characteristics<sup>2</sup></b>						
$R_G$	Gate Resistance	$V_{GS}=0V, V_{DS}=0V,$ Frequency=1MHz	—	1.3	—	$\Omega$
$C_{iss}$	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	$V_{DD}=12.5V, R_L=30\Omega$ $I_D=1A, V_{GS}=10V$ $R_G=6\Omega$	—	16		ns
$t_r$	Turn-On Rise Time		—	15		
$t_{d(off)}$	Turn-Off Delay Time		—	55		
$t_f$	Turn-Off Fall Time		—	25		
<b>Gate Charge Characteristics<sup>2</sup></b>						
$Q_g$	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		

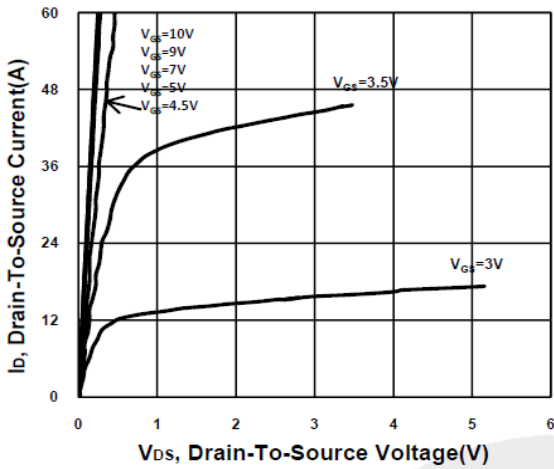
Note: 1: Pulse test; pulse width  $\leq 300ns$ , duty cycle  $\leq 2\%$ .

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

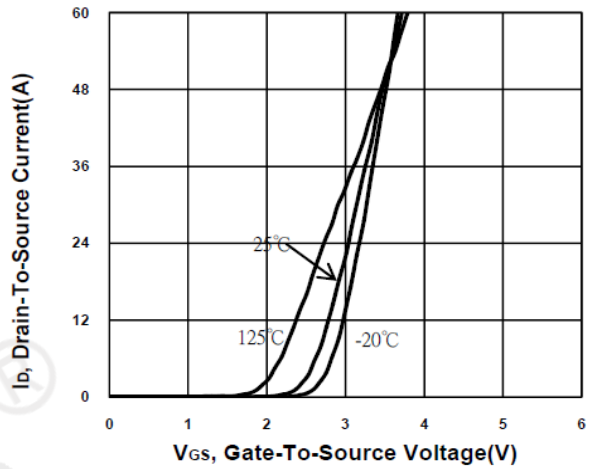


# Typical Operating Characteristics

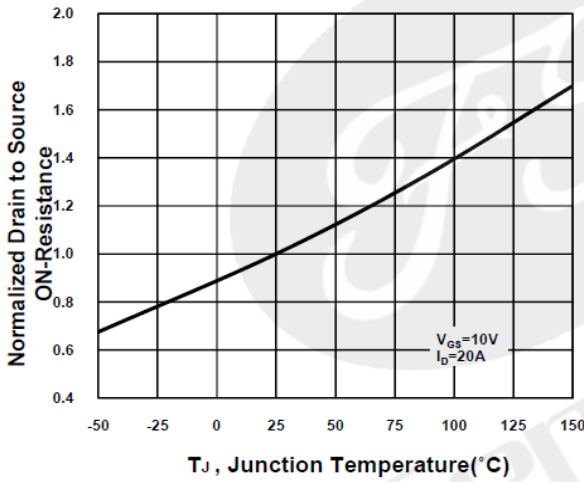
### Output Characteristics



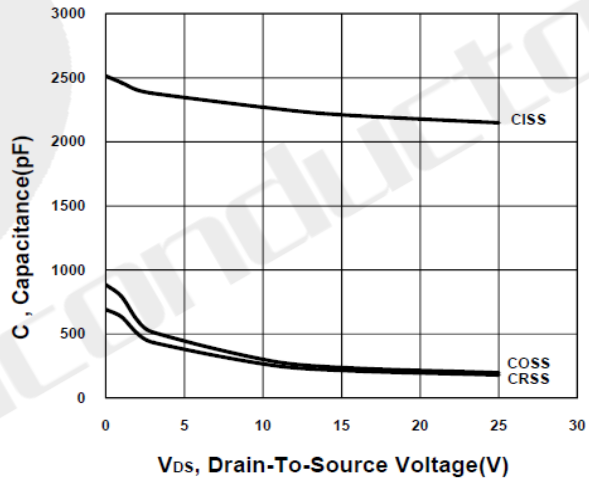
### Transfer Characteristics



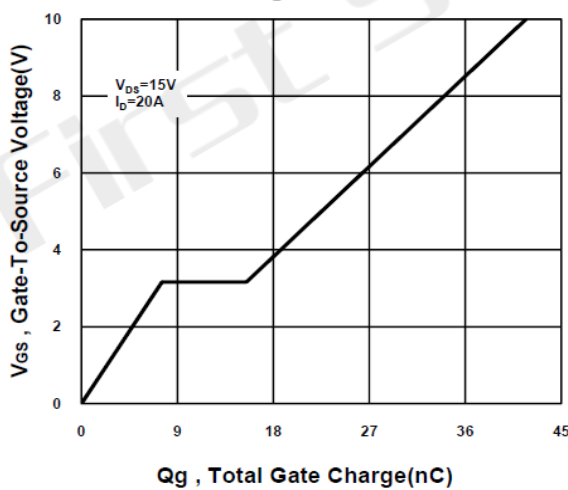
### On-Resistance VS Temperature



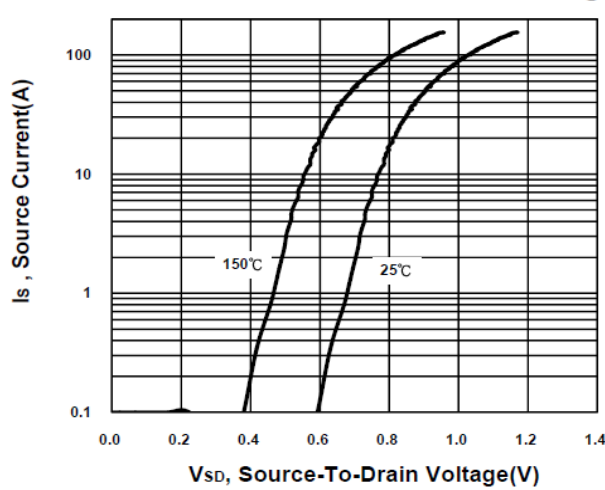
### Capacitance Characteristic



### Gate charge Characteristics



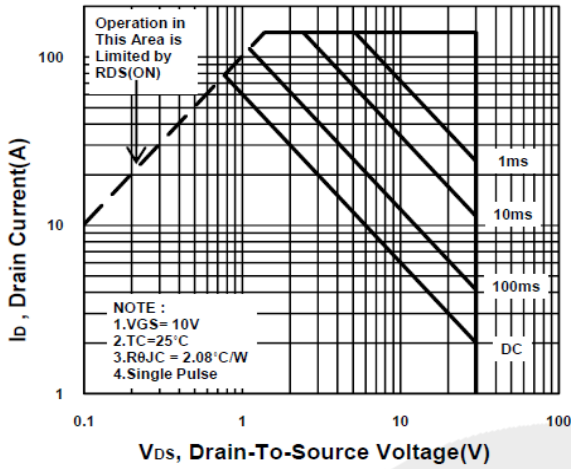
### Source-Drain Diode Forward Voltage



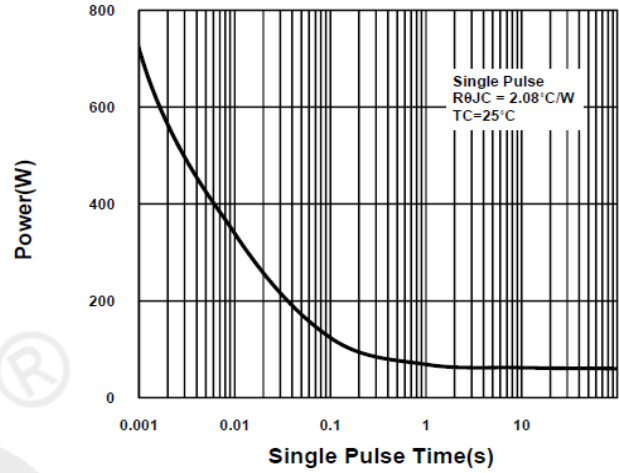


# Typical Operating Characteristics

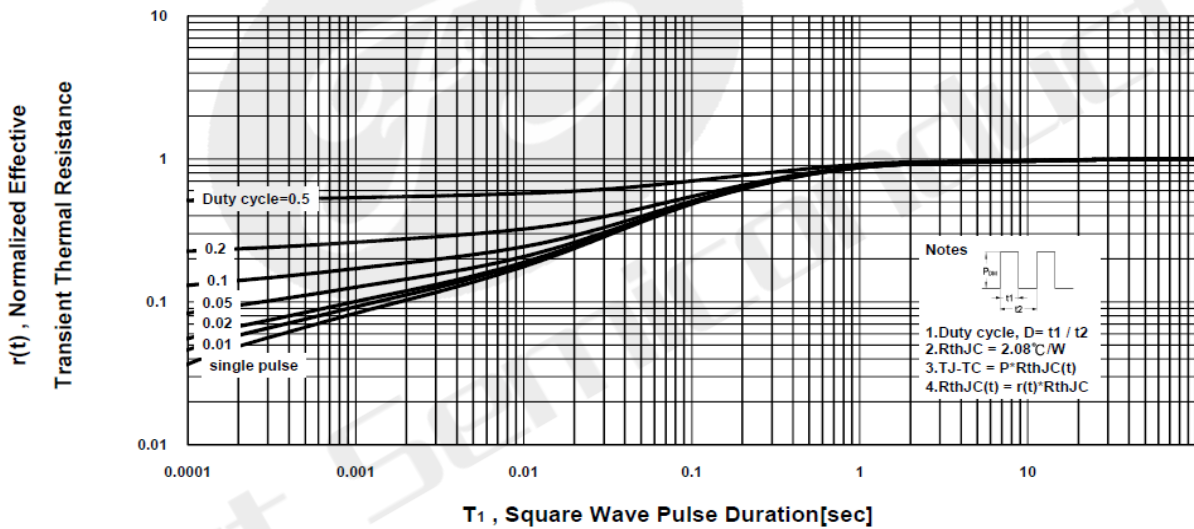
## Safe Operating Area



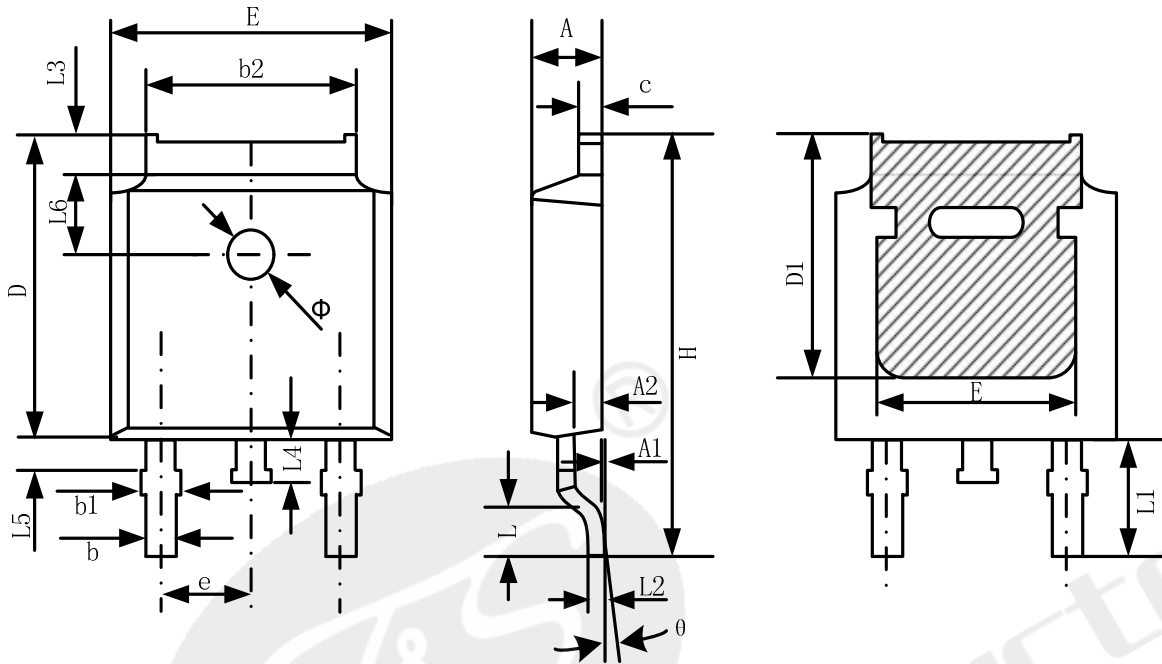
## Single Pulse Maximum Power Dissipation



## Transient Thermal Response Curve



### Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.20	2.38	0.087	0.094
A1	0.00	0.10	0.000	0.004
A2	0.90	1.10	0.035	0.043
b	0.72	0.85	0.028	0.033
b1	0.72	0.90	0.028	0.035
b2	5.13	5.46	0.202	0.215
c	0.47	0.60	0.019	0.024
D	6.00	6.20	0.236	0.244
D1	5.25	--	0.207	--
E	6.50	6.70	0.256	0.264
E1	4.70	--	0.185	--
e	2.19	2.39	0.086	0.094
H	9.80	10.40	0.386	0.409
L	1.40	1.70	0.055	0.067
L1	2.90 REF		0.114 REF	
L2	0.508 BSC		0.020 BSC	
L3	0.90	1.25	0.035	0.049
L4	0.60	1.00	0.024	0.039
L5	0.15	0.75	0.006	0.030
L6	1.80 REF		0.071 REF	
Φ	1.20	1.40	0.047	0.055
θ	0°	8°	0°	8°



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	

