



N-Channel 100-V (D-S) MOSFET

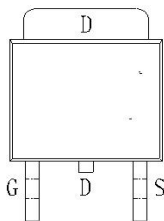
● FEATURES

- RDS(ON) [17mΩ@VGS=6V](#) (TYP)
- RDS(ON) [13mΩ@VGS=10V](#) (TYP)
- high density cell design for extremely low RDS(ON)
- Exceptional on-resistance and maximum DC current capability

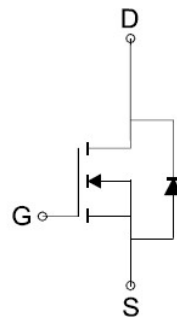
● GENERAL DESCRIPTION

The FS65N10 combines advanced trench MOSFET technology with a low resistance package to provide extremely low R_{DS(ON)}. This device is ideal for load switch and battery protection applications.

● PIN CONFIGURATION



TO252



N-Channel MOSFET

● Absolute Maximum Ratings (T_A=25°C Unless Otherwise Noted)

Parameter	Symbol	Limit	Units
Drain-Source Voltage	V _{DS}	100	V
Gate-Source Voltage	V _{GS}	±20	V
Drain Current-Continuous	I _D T _C =25°C	65	A
	I _D T _C =100°C	28	
Drain Current-Pulsed a	I _{DM}	180	A
Maximum Power Dissipation @ T _C = 25°C -Derate above 25°C	P _D	125	W
		0.83	W/°C
Single Pulsed Avalanche Energy ^d	E _{AS}	45	mJ
Operating and Store Temperature Range	T _J ,T _{stg}	-55 to 175	°C

Thermal Characteristics

Parameter	Symbol	Limit	Units
Thermal Resistance, Junction-to-Case	R _{qJC}	1.2	°C/W
Thermal Resistance, Junction-to-Ambient	R _{qJA}	65	°C/W



● **Electrical Characteristics** ($T_J=25^{\circ}\text{C}$ unless otherwise noted)

Symbol	Parameter	Limit	Min	Typ	Max	Unit
STATIC						
BVDSS	Drain-Source Breakdown Voltage	VGS=0V, ID=250 μ A	100			V
VGS(th)	Gate Threshold Voltage	VDS=VGS, ID=250 μ A	1	2	3	V
IGSS	Gate Leakage Current	VDS=0V, VGS= \pm 20V			\pm 100	nA
IDSS	Zero Gate Voltage Drain Current	VDS=100V, VGS=0V			1	μ A
RDS(ON)	Drain-Source On-State Resistance	VGS=10V, ID= 12A		13	16	m Ω
		VGS=6V, ID= 8A		17	22	
		VGS=4.5V, ID= 8A		22	28	
VSD	Diode Forward Voltage	IS=2.7A, VGS=0V		0.72	1.1	V
DYNAMIC^c						
Qg	Total Gate Charge(10V)	VDS=50V, ID=40A VGS=10V		36	68	nC
Qgs	Gate-Source Charge			9	18	
Qgd	Gate-Drain Charge			9	19	
Ciss	Input capacitance	VDS=25V, VGS=0V, f=1.0MHz		1800	3300	pF
Coss	Output Capacitance			170	340	
Crss	Reverse Transfer Capacitance			90	180	
SwitchingTimes						
td(on)	Turn-on Delay Tim	VDD=65V, ID=40A, RL=15 Ω VGS=10V, RG=2.5 Ω		15		nS
tr	Turn-on Rise Time			10		nS
td(off)	Turn-Off Delay Time			40		nS
tf	Turn-Off Fall Time			6		nS
Source-DrainDiodeCharacteristics						
ISD	Source-Drain Current(Body Diode)			45		A
ISDM	Pulsed Source-Drain Current(Body Diode)			90		A
VSD	Forward On Voltage(Note 1)	TJ=25 $^{\circ}$ C, ISD=40A, VGS=0V		0.6	1	V
trr	Reverse Recovery Time(Note 1)	TJ=25 $^{\circ}$ C, IF=40A di/dt=100A/ μ s		101		nS
Qrr	Reverse Recovery Charge(Note 1)			193		nC
ton	Forward Turn-on Time	Intrinsic turn-on time is negligible (turn-on is dominated by LS+LD)				

Notes 1. Pulse Test: Pulse Width \leq 300 μ s, Duty Cycle \leq 1.5%, RG=25 Ω , Starting TJ=25 $^{\circ}$ C



● Typical Performance Characteristics (T =25°C)

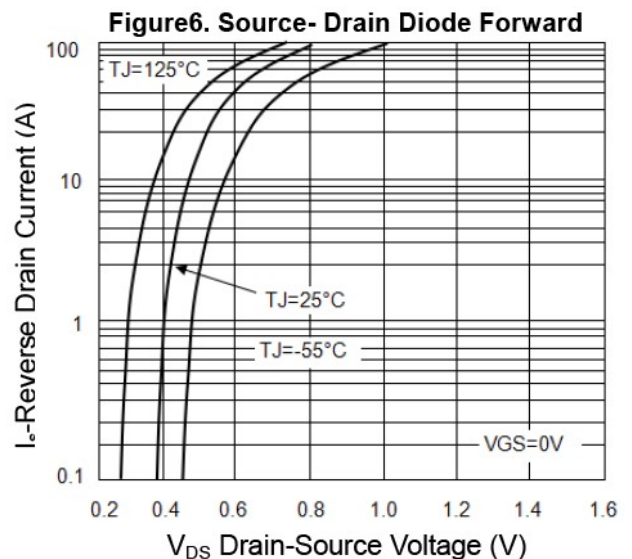
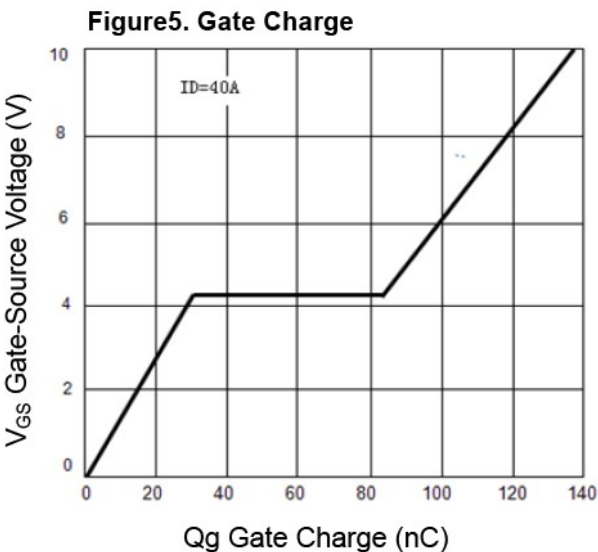
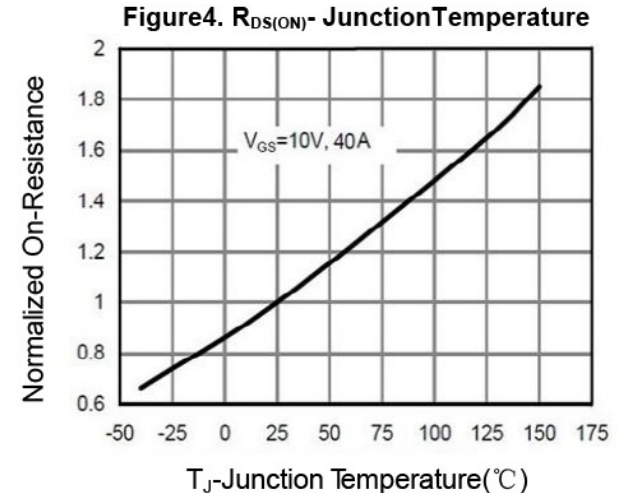
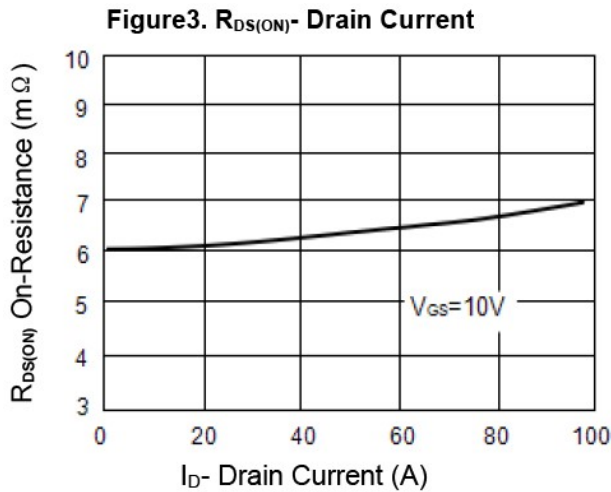
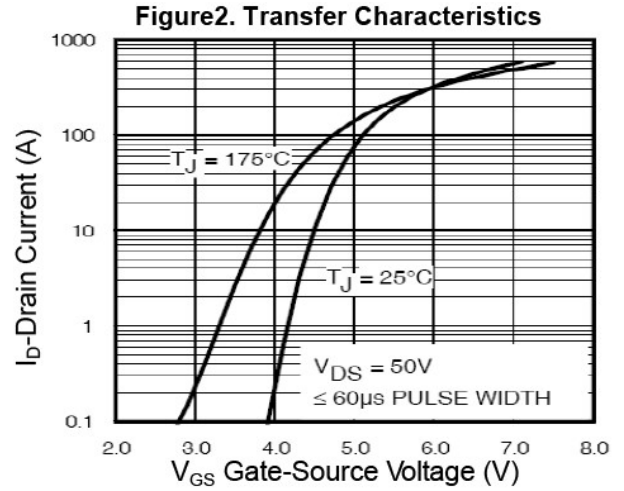
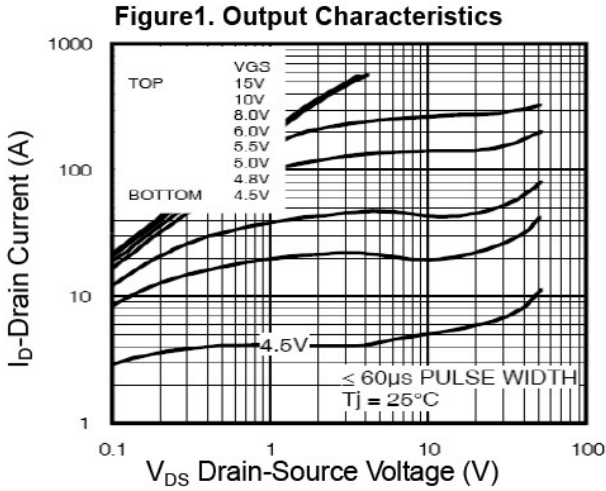




Figure7. Capacitance vs V_{DS}

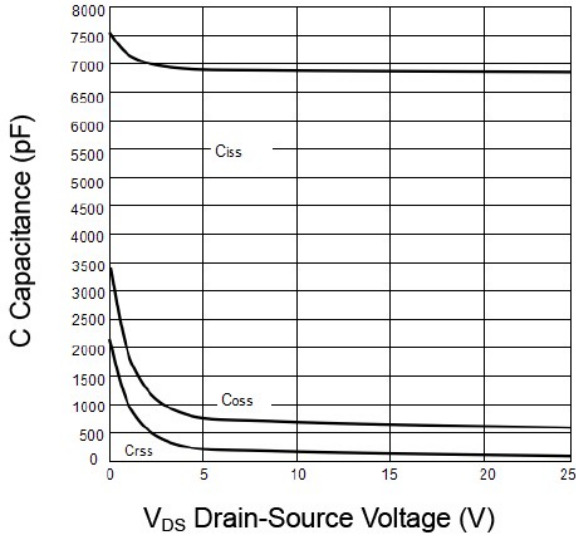


Figure8. Safe Operation Area

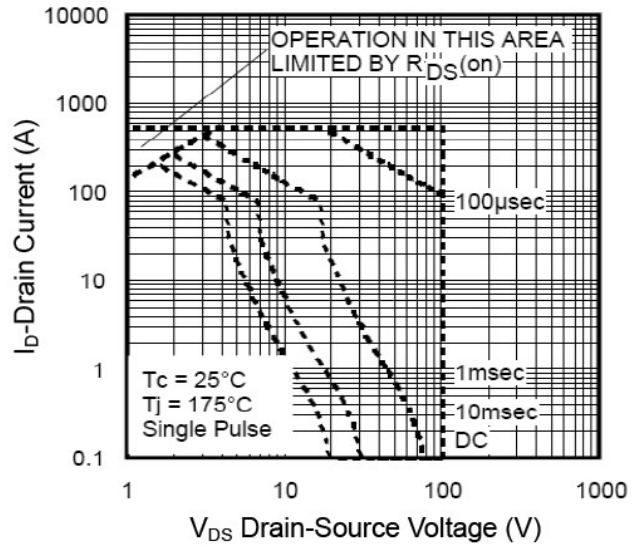


Figure9. BV_{DSS} vs Junction Temperature

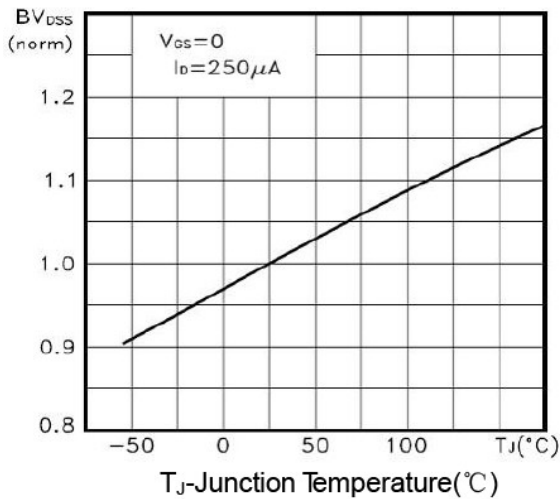


Figure10. V_{GS(th)} vs Junction Temperature

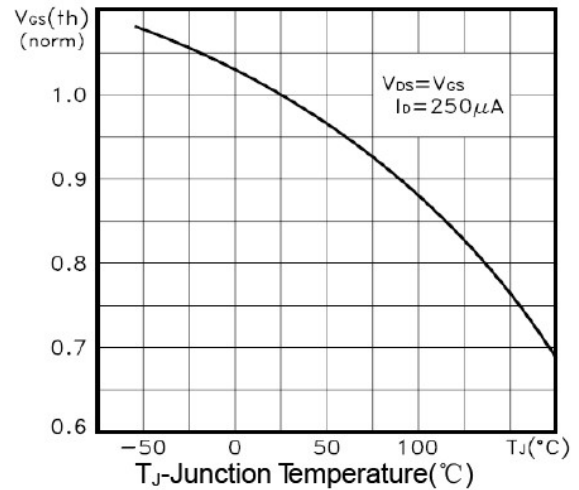
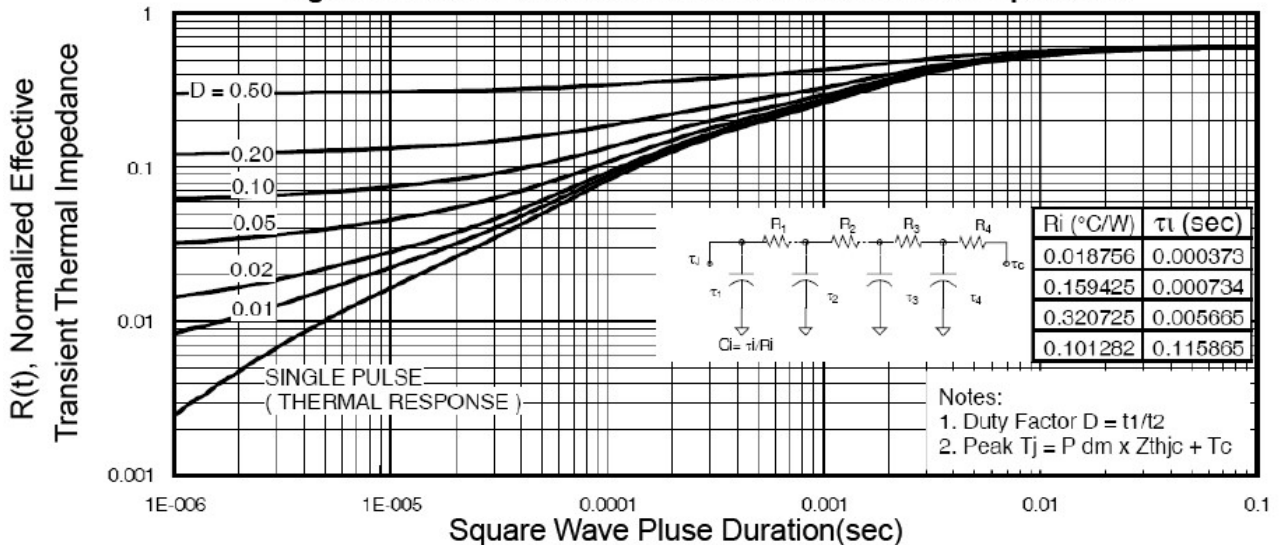


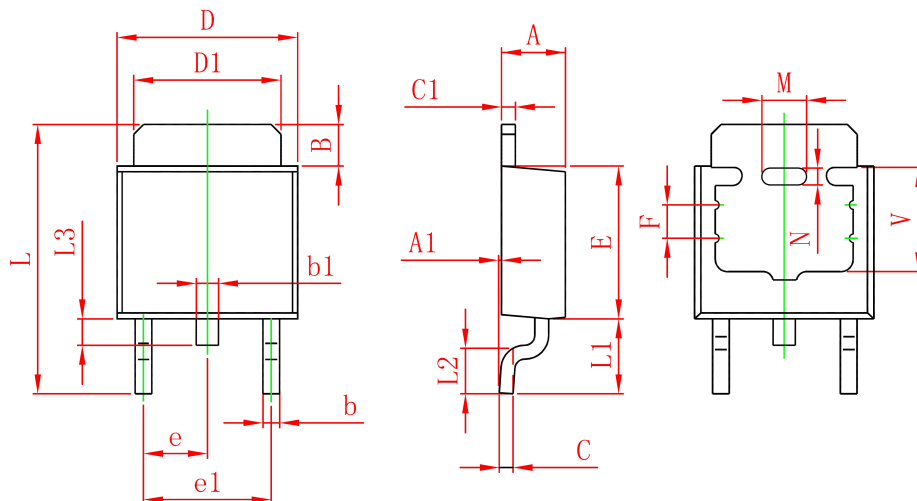
Figure11. Normalized Maximum Transient Thermal Impedance





● PACKAGE

TO-252C-2L PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In 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
F	1.200REF.		0.047REF.	
M	1.600REF.		0.063REF.	
N	0.450REF.		0.018REF.	
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	