N-Channel 55V (D-S) MOSFET

Features

55V/110A ,

$R_{DS(ON)}$ = 5.0mΩ(typ.) @ V_{GS} = 10V

Super high density cell design for extremely low $R_{DS(ON)}$

Exceptional on-resistance and maximum DC current capability

GENERAL DESCRIPTION

The FS3205 is the N-Channel logic enhancement mode power field effect transistors, using high cell density, DMOS trench technology. This high density process is especially tailored to minimize on state resistance.

Pin Configuration

TO-220

Absolute Maximum Ratings @ T_A = 25°C unless otherwise specified

Symbol	Parameter		Rating	Unit
V_{DSS}	Drain-Source Voltage		55	V
V_{GSS}	Gate-Source Voltage		±20	
I_D	Continuous Drain Current	V_{GS}=10V	110	A
I_{DM}	300μs Pulsed Drain Current		430	
T_J	Maximum Junction Temperature		175	°C
T_{STG}	Storage Temperature Range		-55 to 175	
P_D	Maximum Power Dissipation	T_A=25°C	200	W
		T_A=100°C	120	
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient		215	°C/W

Notes：

mounted on a 1in^2 FR-4 board with 2oz. Copper in a still air environment at 25°C， the current rating is based on the DC （<10s） test conditions , for each single die. Pulse Test：Pulse Width < 300 μS, Duty Cycle < 2%.

● **Electrical Characteristics @** T_A = 25°C unless otherwise specified

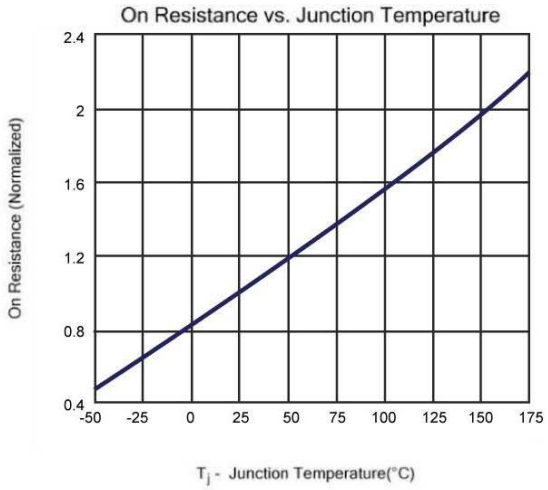
Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_{DS}=250μA	55			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=55V, V_{GS}=0V			1	μA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_{DS}=250μA	3.0		5.0	V
I_{GSS}	Gate Leakage Current	V_{GS}=±20V, V_{DS}=0V			±1	μA
$R_{DS(ON)}$	Drain-Source On-state Resistance	V_{GS}=10V, I_{DS}=62A		5.0	7.0	mΩ
V_{SD}	Diode Forward Voltage	I_{SD}=62A, V_{GS}=0V		0.9	1.2	V
Gate Charge Characteristics						
Q_g	Total Gate Charge	V_{DS}=44V, V_{GS}=10V,I_{DS}=60A		91		nC
Q_g	Total Gate Charge	V_{DS}=44V, V_{GS}=4.5V,I_{DS}=60A		28		
Q_{gs}	Gate-Source Charge			41		
Q_{gd}	Gate-Drain Charge			18		
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=15V, Frequency=1.0MHz		6330		pF
C_{oss}	Output Capacitance			495		
C_{rss}	Reverse Transfer Capacitance			154		
R_g	Gate-Resistance	V_{DS}=0V, V_{GS}=0V, f=1MHz		2.4		Ω
$t_{d(ON)}$	Turn-on Delay Time	V_{DS}=28V, R_L=28Ω, V_{GS}=10V, R_G=6Ω		55		ns
T_r	Turn-on Rise Time			12		
$t_{d(OFF)}$	Turn-off Delay Time			90		
T_f	Turn-off Fall Time			16		

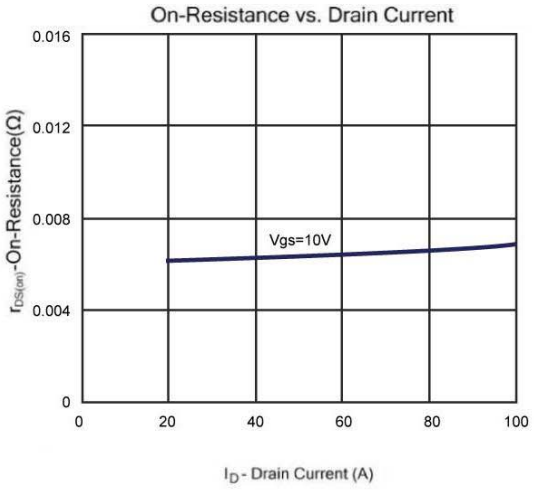
NOTE:

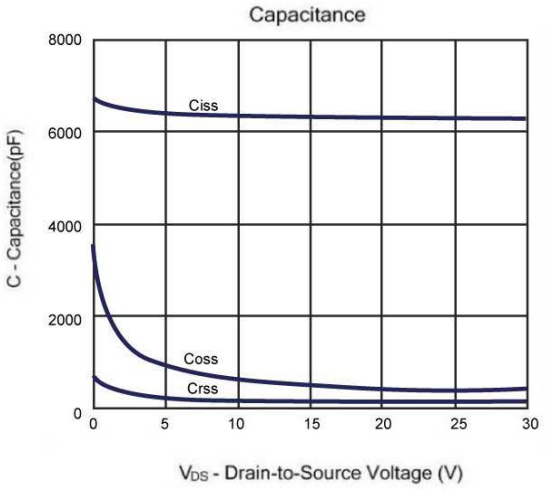
1、mounted on a 1in2 FR-4 board with 2oz. Copper in a still air environment at 25°C， the current rating is based on the DC （<10s） test conditions

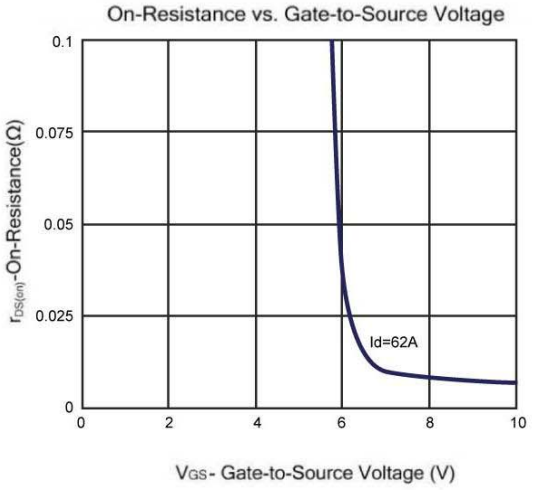
2、Pulse test ; pulse width≤300μs, duty cycle≤2%.

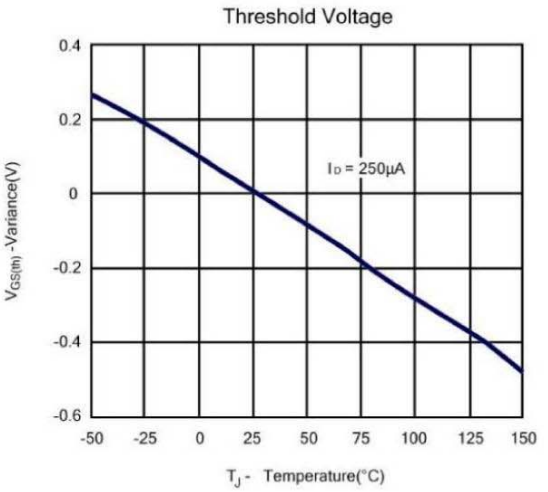
- **Typical Performance Characteristics**

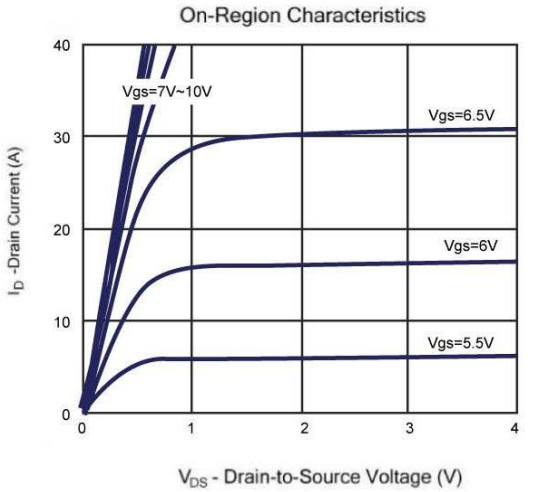


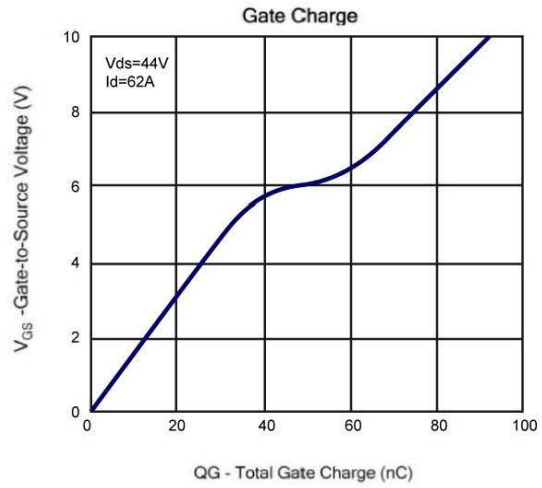


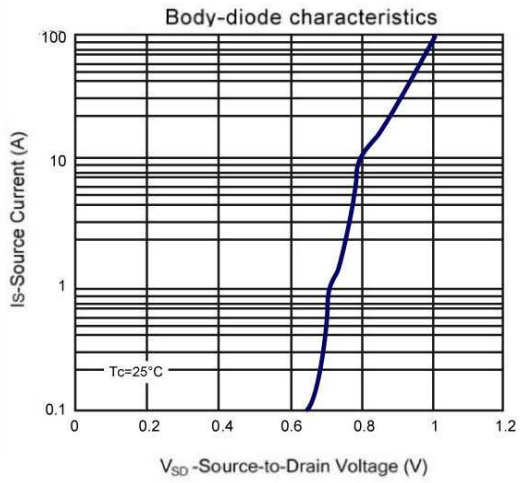


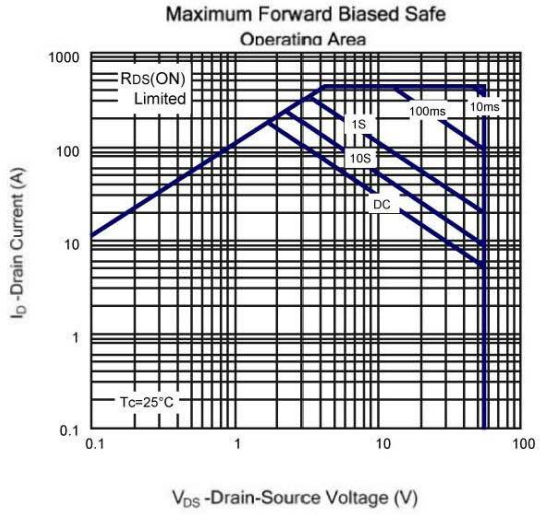


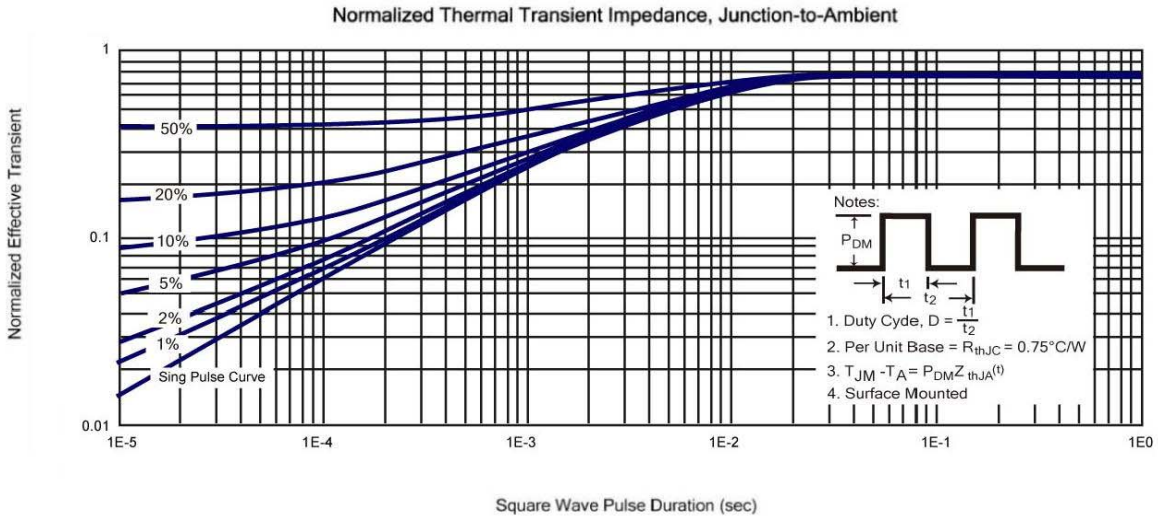





Gate Charge
Vds=44V
Id=62A
VGS -Gate-to-Source Voltage (V)
QG - Total Gate Charge (nC)

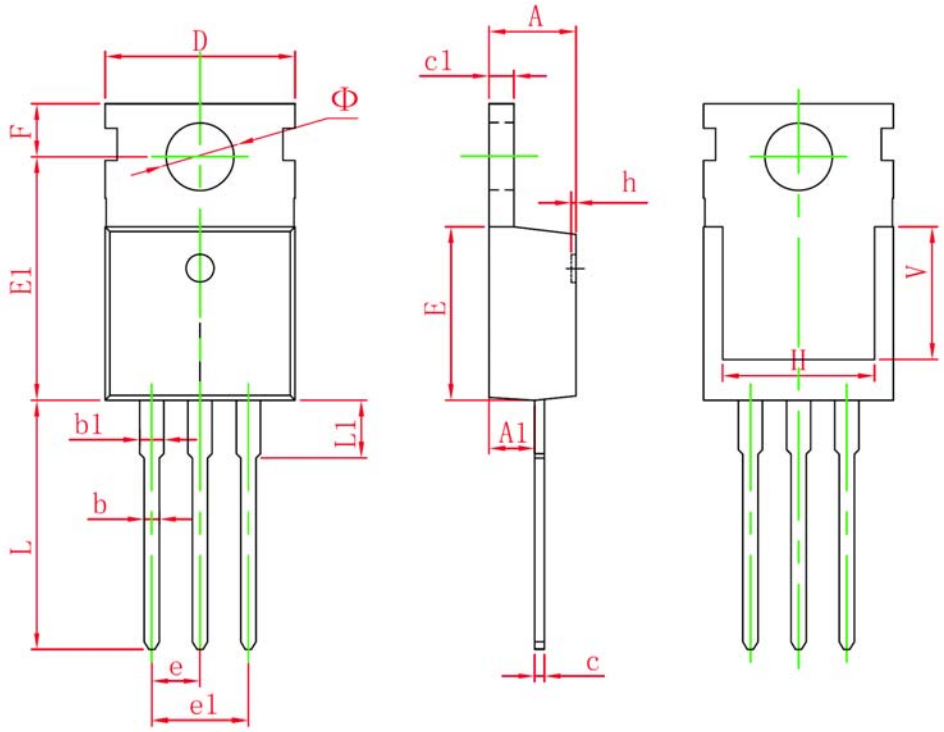

Body-diode characteristics
IS-Source Current (A)
Tc=25°C
VSD -Source-to-Drain Voltage (V)


Maximum Forward Biased Safe Operating Area
RDS(ON) Limited
100ms
10ms
1S
10S
DC
Tc=25°C
ID -Drain Current (A)
VDS -Drain-Source Voltage (V)


Normalized Thermal Transient Impedance, Junction-to-Ambient
50%
20%
10%
5%
2%
1%
Sing Pulse Curve
Notes:
PDM
t1
t2
1. Duty Cyde, D = t1/t2
2. Per Unit Base = RthJC = 0.75°C/W
3. TJM -TA= PDMZthJA(t)
4. Surface Mounted
Normalized Effective Transient
Square Wave Pulse Duration (sec)

- **Package Information**

TO-220-3L-C(T0.5mm) PACKAGE OUTLINE DIMENSIONS



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	8.950	9.750	0.352	0.384
E1	12.650	2.950	0.498	0.116
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