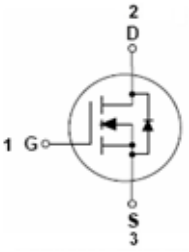
Super Junction Power MOSFET
SJ65R190

Features

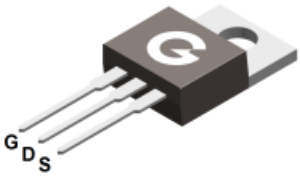
HF

- Very low FOM $R_{DS(on)} \times Q_G$
- Very high commutation ruggedness



APPLICATIONS

- Switch Mode Power Supply (SMPS)
- Power Factor Correction (PFC)
- Uninterruptible Power Supply (UPS)



TO-220AB

Mechanical Data

- Case: TO-220AB
- Molding Compound: UL Flammability Classification Rating 94V-0
- Terminals: Matte tin-plated leads; solderability-per MIL-STD-202, Method 208

Ordering Information

Part Number	Package	Shipping Quantity	Marking Code
SJ65R190	TO-220AB	50 pcs / Tube	SJ65R190

Maximum Ratings (@ T_J = 25°C unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	650	V
Gate-Source Voltage	V_{GSS}	±30	V
Continuous Drain Current (T_C = 25°C) *1	I_D	21	A
Continuous Drain Current (T_C = 125°C) *1		12	A
Pulsed Drain Current (T_C = 25°C)	I_{DM}	60	A
Single Pulse Avalanche Energy *2	E_{AS}	500	mJ

Thermal Characteristics

Parameter	Symbol	Value	Unit
Power Dissipation (T_C = 25°C)	P_D	151	W
Thermal Resistance Junction-to-Air (T_C = 25°C)	$R_{\theta JA}$	62	°C/W
Thermal Resistance Junction-to-Case (T_C = 25°C)	$R_{\theta JC}$	0.82	°C/W
Operating Junction Temperature Range	T_J	-55 ~ +150	°C
Storage Temperature Range	T_{STG}	-55 ~ +150	°C

Electrical Characteristics (@ T_J = 25°C unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS} = 0V, I_D = 250μA	650	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 650V, V_{GS} = 0V	-	-	1	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS} = ±30V, V_{DS} = 0V	-	-	±100	nA
On Characteristics						
$R_{DS(ON)}$	Static Drain-Source On-resistance	V_{GS} = 10V, I_D = 7.3A	-	-	0.19	Ω
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250μA	2.0	-	4.0	V
R_G	Gate resistance	V_{DD} = 0, V_{GS} = 0, f = 1MHz	-	18	-	Ω
Dynamic Characteristics						
C_{ISS}	Input Capacitance	V_{GS} = 0V V_{DS} = 50V f = 250KHz	-	1610	-	pF
C_{OSS}	Output Capacitance		-	70	-	
C_{RSS}	Reverse Transfer Capacitance		-	0.74	-	
Switching Characteristics						
$t_{d(ON)}$	Turn-on Delay Time	V_{DD} = 400V V_{GS} = 10V I_D = 10A	-	25.6	-	ns
t_r	Turn-on Rise Time		-	34.6	-	
$t_{d(OFF)}$	Turn-Off Delay Time		-	120	-	
t_f	Turn-Off Fall Time		-	29.8	-	
Q_G	Total Gate-Charge	V_{DS} = 480V V_{GS} = 10V I_D = 10A	-	44	-	nC
Q_{GS}	Gate to Source Charge		-	5.7	-	
Q_{GD}	Gate to Drain (Miller) Charge		-	17	-	
Source-Drain Diode Characteristics						
V_{SD}	Diode Forward Voltage	I_F = 10A, V_{GS} = 0V	-	0.84	-	V
I_S	Diode Continuous Forward Current	T_C = 25°C	-	-	20	A
I_{SM}	Pulsed Source-Drain Current *2		-	-	45	A
t_{rr}	Reverse Recovery Time	I_F = 8A, V_R = 400 V di_F/dt = 100 A/μs	-	290	-	ns
Q_{rr}	Reverse Recovery Charge		-	4	-	μC

Notes:

1. Pulse width tp limited by $T_{J\,(Max.)}$
2. V_{DD} = 50V, I_D = 4.5A, R_G = 25Ω, Starting T_J = 25°C

Ratings and Characteristics Curves (@ T_J = 25°C unless otherwise specified)

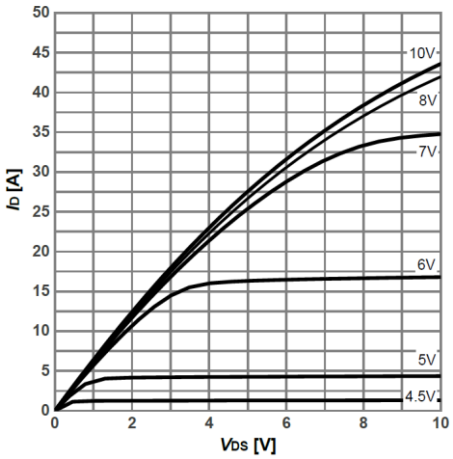


Fig 1 Typical Output Characteristics

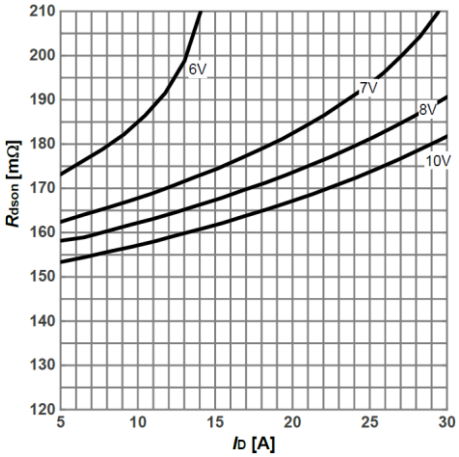


Fig 2 On-Resistance vs. Drain Current and Gate Voltage

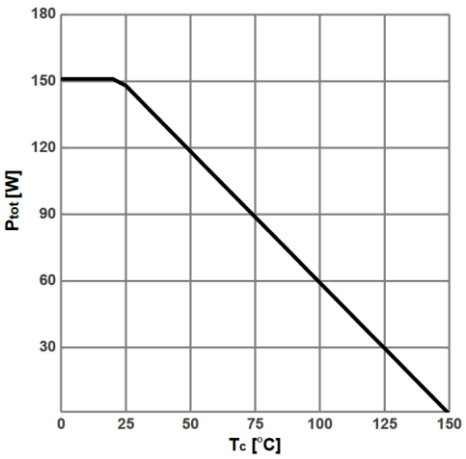


Fig 3 Power Dissipation vs. Case Temperature

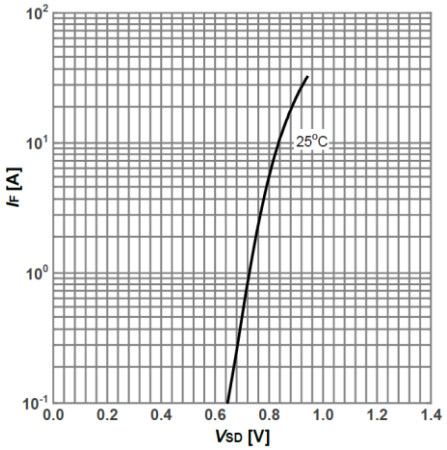


Fig 4 Body-Diode Characteristics

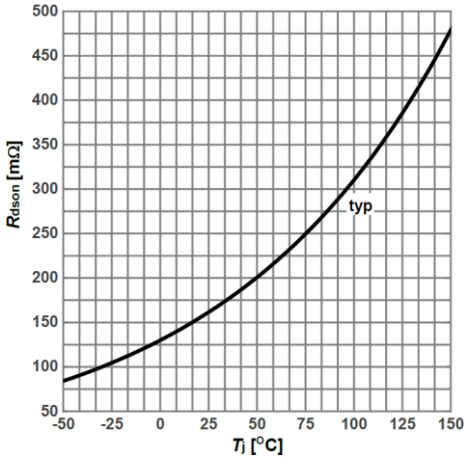


Fig 5 On-Resistance vs. Junction Temperature

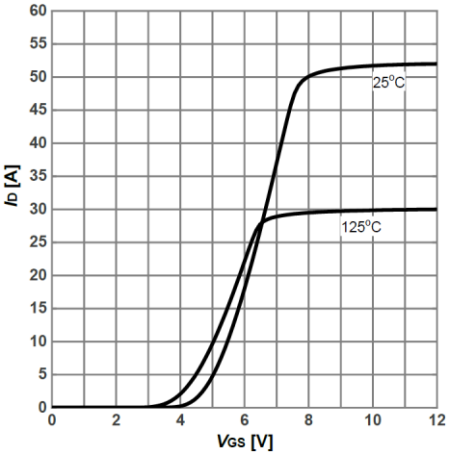


Fig 6 Transfer Characteristics

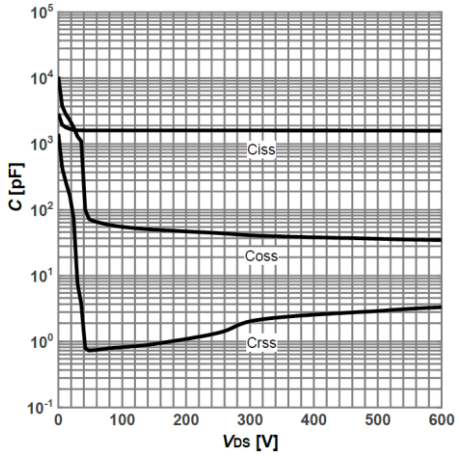


Fig 7 Capacitance Characteristics

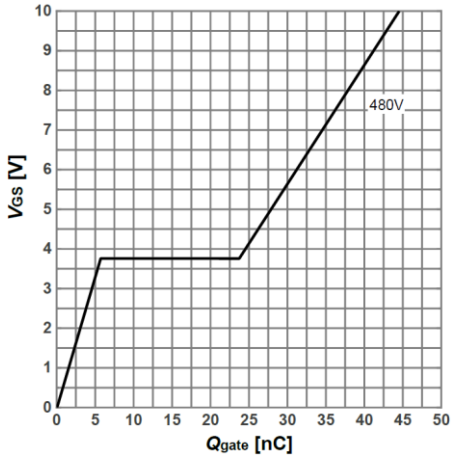


Fig 8 Gate-Charge Characteristics

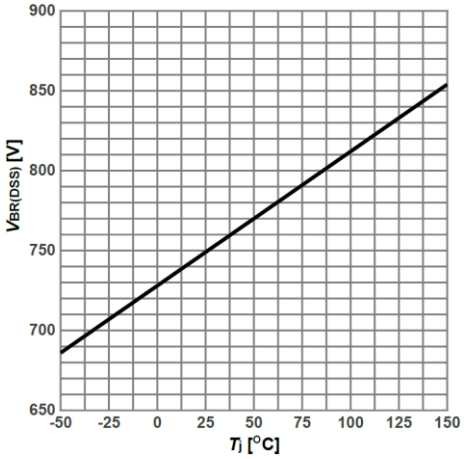


Fig 9 Breakdown Voltage vs. Junction Temperature

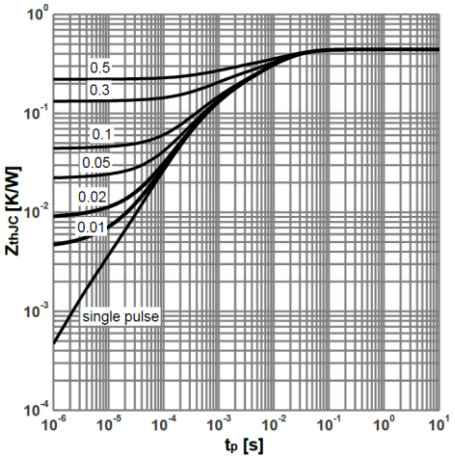


Fig 10 Transient Thermal Resistance

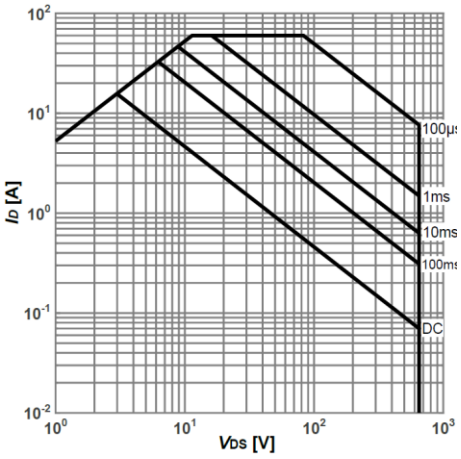
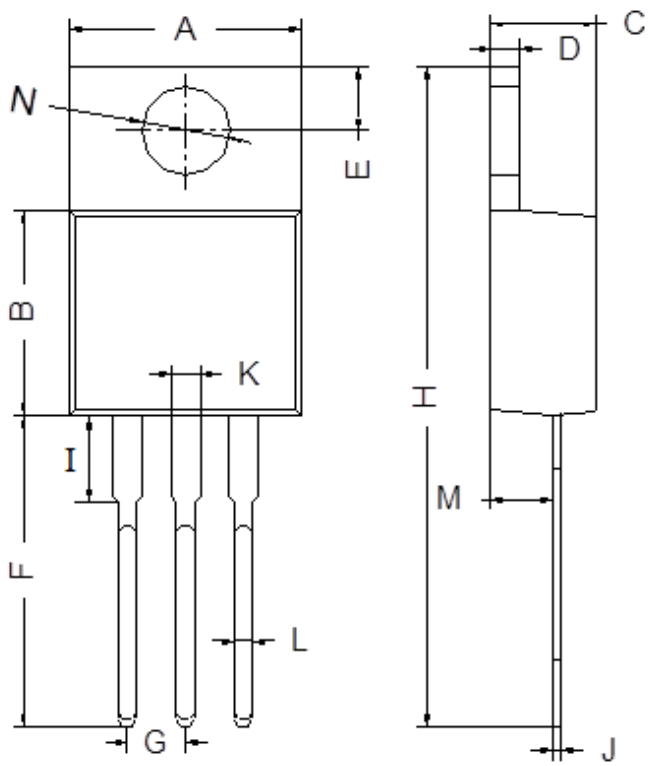


Fig 11 Safe Operation Area

Package Outline Dimensions (Unit: mm)



TO-220AB		
Dimension	**Min.**	**Max.**
A	9.80	10.30
B	8.70	9.10
C	4.37	4.77
D	1.07	1.47
E	2.64	2.84
F	13.14	13.74
G	2.44	2.64
H	28.03	28.83
I	3.50	4.00
J	0.28	0.48
K	1.22	1.32
L	0.71	0.91
M	2.40	2.60
N	3.76	3.96

IMPORTANT NOTICE