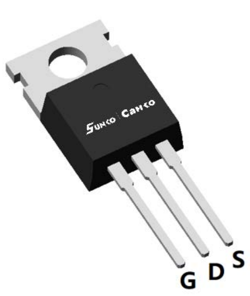
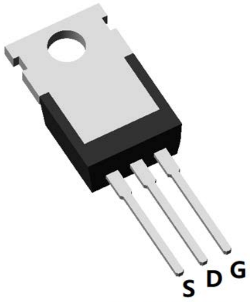
N-Channel Enhancement Mode Field Effect Transistor

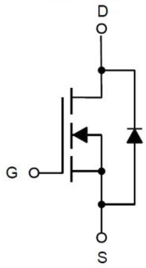


Top View



Bottom View

TO-220



Product Summary

● V_{DS}	100V
● I_D	130A
● $R_{DS(ON)}$(at V_{GS}=10V)	＜5.5mohm

- 100% UIS Tested
- 100% ▽V_{DS} Tested

General Description

- Split gate trench MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low $R_{DS(ON)}$

Applications

- Power switching application
- Uninterruptible power supply
- DC-DC convertor

■ Absolute Maximum Ratings (T_A=25℃ unless otherwise noted)

Parameter		Symbol	Limit	Unit
Drain-source Voltage		V_{DS}	100	V
Gate-source Voltage		V_{GS}	±20	V
Drain Current	T_C=25℃	I_D	130	A
	Tc=100℃		82	
Pulsed Drain Current [A]		I_{DM}	520	A
Avalanche energy [B]		EAS	552	mJ
Total Power Dissipation [C]	Tc=25℃	P_D	310	W
	Tc=100℃		125	
Junction and Storage Temperature Range		T_J ,T_{STG}	-55～+150	℃

■Thermal resistance

Parameter		Symbol	Typ	Max	Units
Thermal Resistance Junction-to-Ambient [D]	Steady-State	$R_{\theta JA}$	30	40	℃/W
Thermal Resistance Junction-to-Case	Steady-State	$R_{\theta JC}$	0.35	0.4	

■ Ordering Information (Example)

PREFERED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
SCP130G10B	B1	SCP130G10B	50	/	5000	Tube

■ Electrical Characteristics (T_J=25℃ unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Parameter						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}= 0V, I_D=250μA	100	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=100V, V_{GS}=0V	-	-	1	μA
		V_{DS}=100V, V_{GS}=0V, Tj=150℃	-	-	100	
Gate-Body Leakage Current	I_{GSS}	V_{GS}= ±20V, V_{DS}=0V	-	-	±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}= V_{GS}, I_D=250μA	2	2.8	4	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=65A	-	4.5	5.5	mΩ
		V_{GS}=10V, I_D=20A	-	4.5	5.5	
Diode Forward Voltage	V_{SD}	I_S=65A, V_{GS}=0V	-	0.9	1.2	V
Gate resistance	R_G	f=1MHz, Open drain	-	0.8	-	Ω
Maximum Body-Diode Continuous Current	I_S		-	-	130	A
Dynamic Parameters						
Input Capacitance	C_{iss}	V_{DS}=50V, V_{GS}=0V, f=1MHz	-	4500	-	pF
Output Capacitance	C_{oss}		-	1700	-	
Reverse Transfer Capacitance	C_{rss}		-	25	-	
Switching Parameters						
Total Gate Charge	Q_g	V_{GS}=10V, V_{DS}=50V, I_D=65A	-	62	-	nC
Gate-Source Charge	Q_{gs}		-	16	-	
Gate-Drain Charge	Q_{gd}		-	14	-	
Reverse Recovery Charge	Q_{rr}	I_F=65A, di/dt=600A/us	-	175	-	nC
Reverse Recovery Time	t_{rr}		-	38	-	ns
Turn-on Delay Time	$t_{D(on)}$	V_{GS}=10V, V_{DD}=50V, I_D=65A R_{GEN}=2.2Ω	-	20	-	ns
Turn-on Rise Time	t_r		-	82	-	
Turn-off Delay Time	$t_{D(off)}$		-	30	-	
Turn-off fall Time	t_f		-	7	-	

A. Repetitive rating; pulse width limited by max. junction temperature.

B. T_J=25℃, V_{DD}=50V, V_G=10V, R_G=25Ω, L=2mH, IAS=23.5A.

C. P_d is based on max. junction temperature, using junction-case thermal resistance.

D. The value of $R_{\theta JA}$ is measured with the device mounted on 1in2 FR-4 board with 2oz. Copper, in a still air environment with T_A =25℃. The maximum allowed junction temperature of 150℃. The value in any given application depends on the user's specific board design.

■Typical Electrical and Thermal Characteristics Diagrams

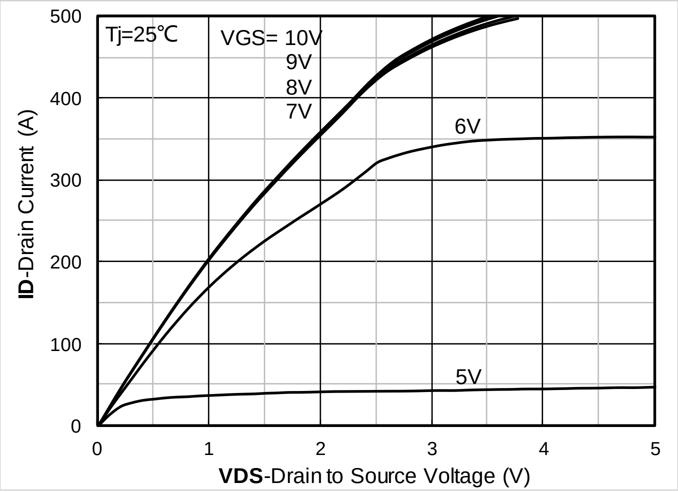


Figure1. Output Characteristics

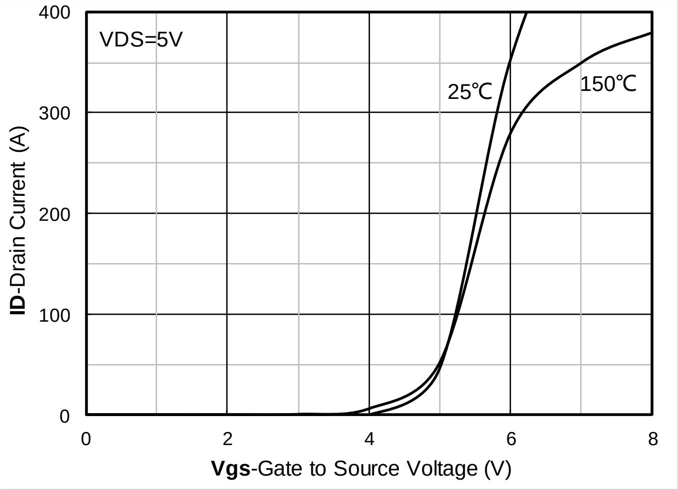


Figure2. Transfer Characteristics

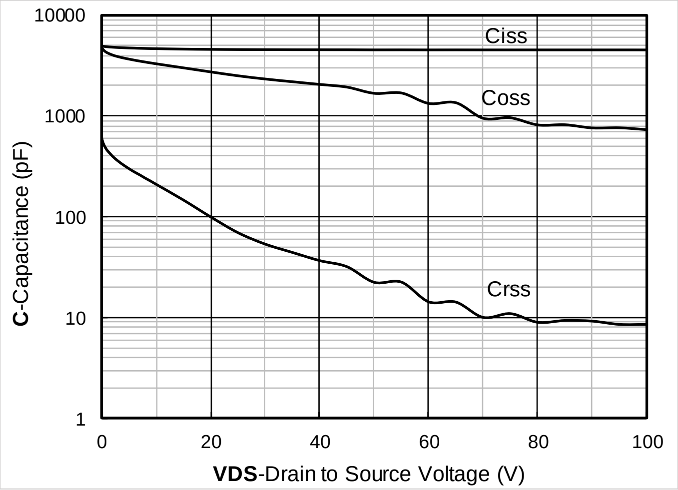


Figure3. Capacitance Characteristics

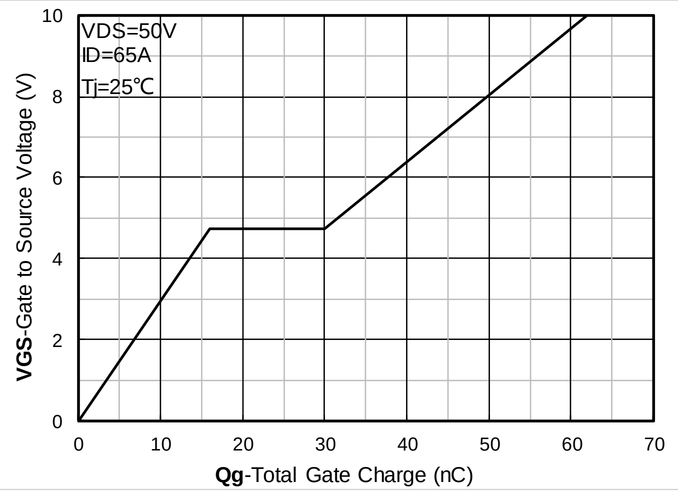


Figure4. Gate Charge

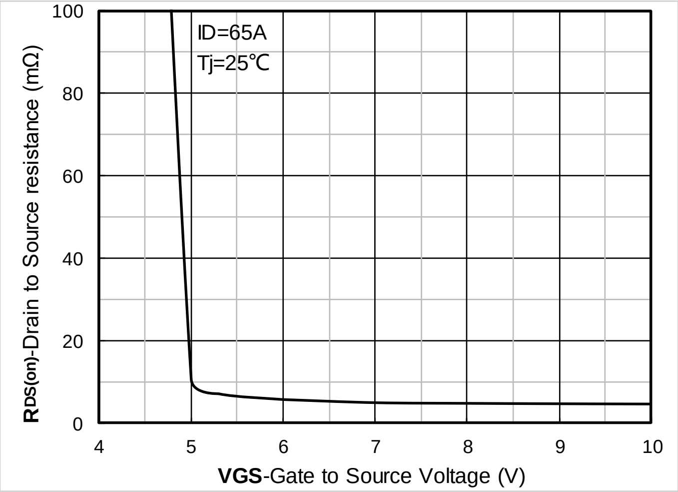


Figure5. On-Resistance vs Gate to Source Voltage

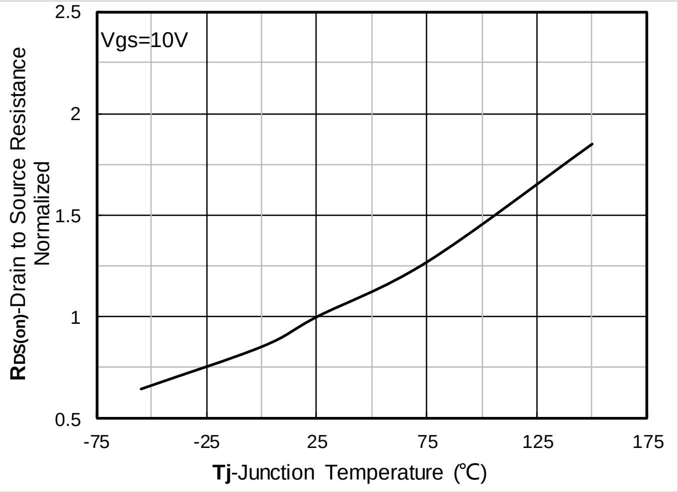


Figure6. Normalized On-Resistance

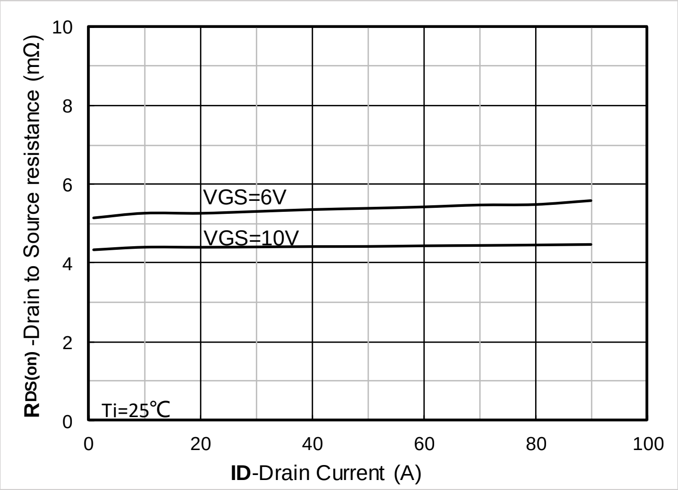


Figure7. RDS(on) VS Drain Current

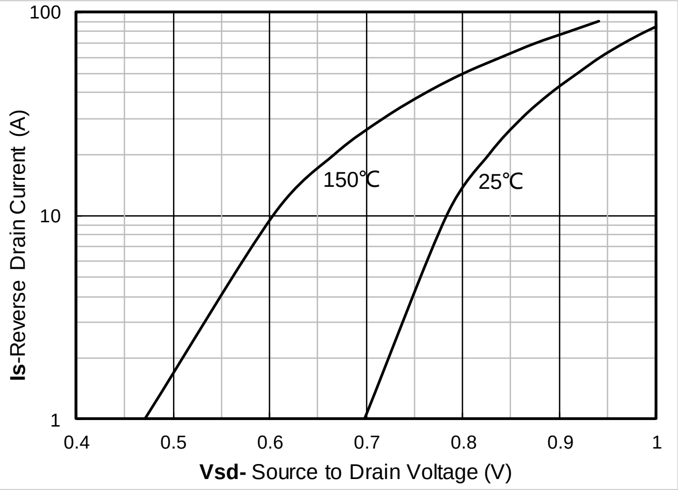


Figure8. Forward characteristics of reverse diode

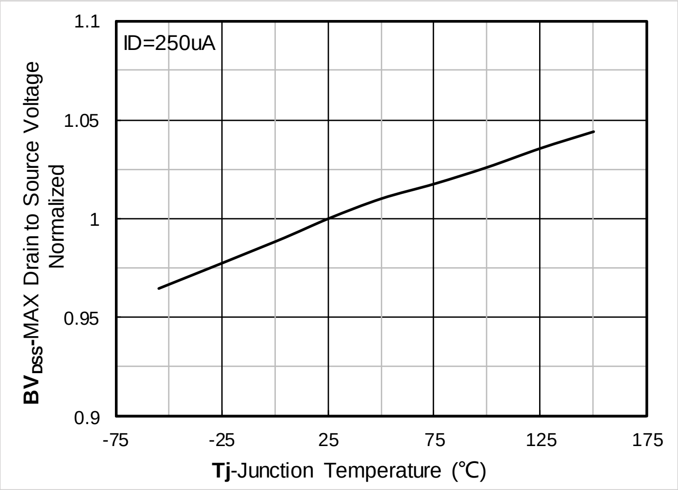


Figure9. Normalized breakdown voltage

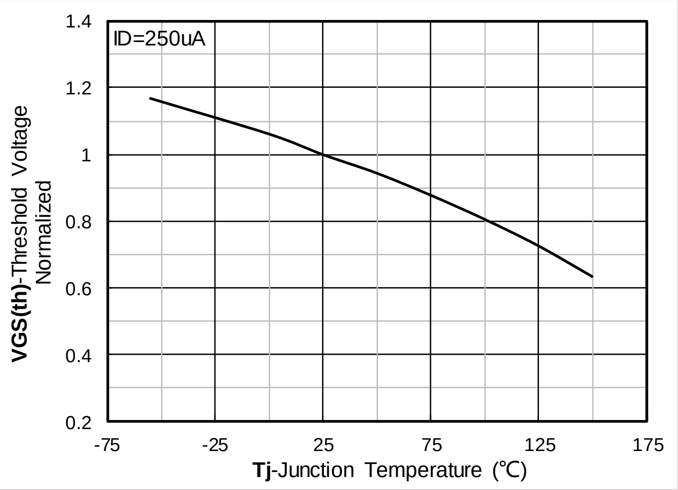


Figure10. Normalized Threshold voltage

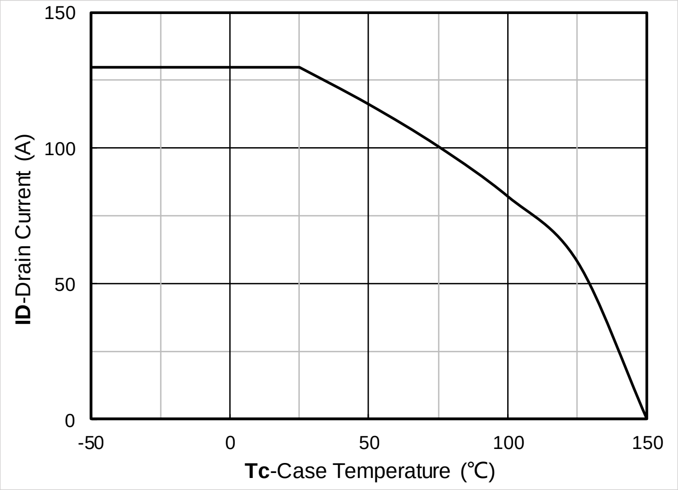


Figure11. Current dissipation

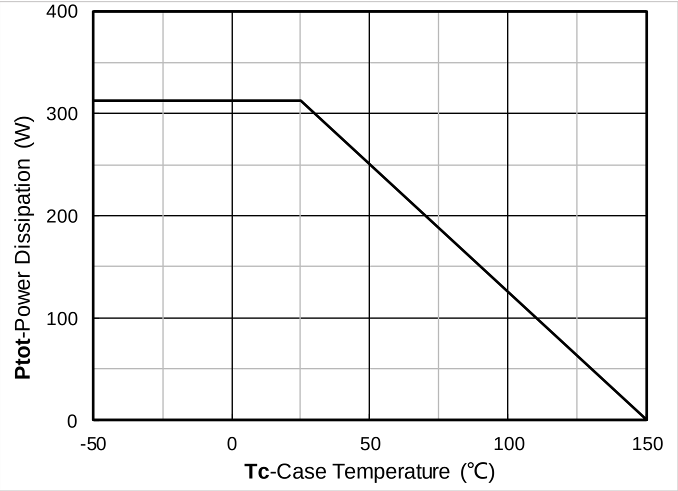


Figure12. Power dissipation

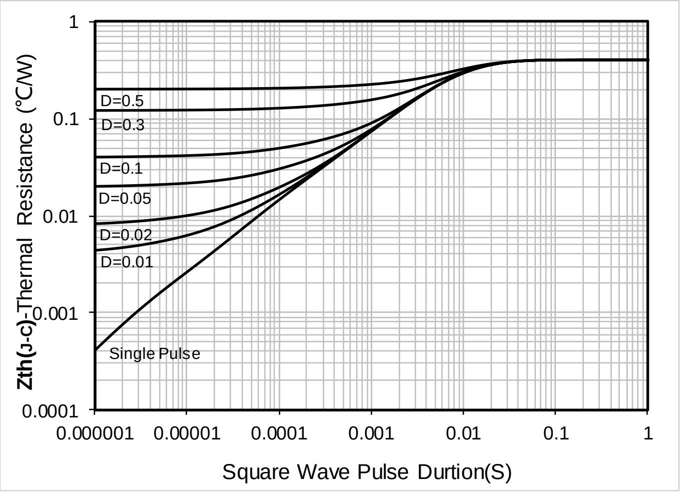


Figure13. Maximum Transient Thermal Impedance

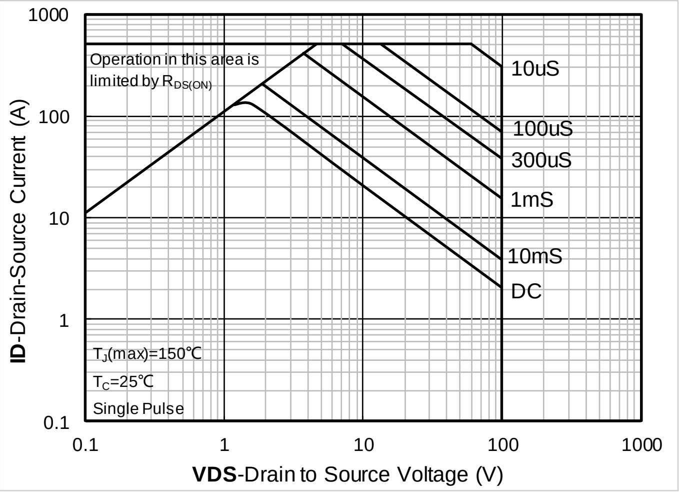
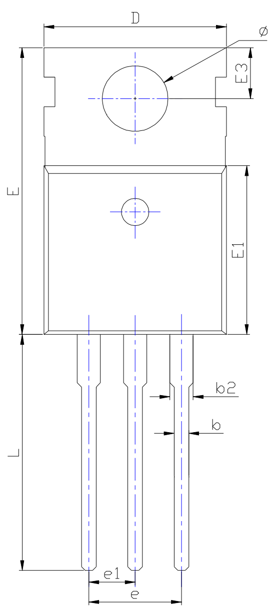
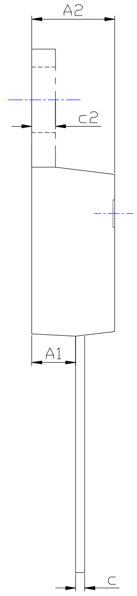


Figure14. Safe Operation Area

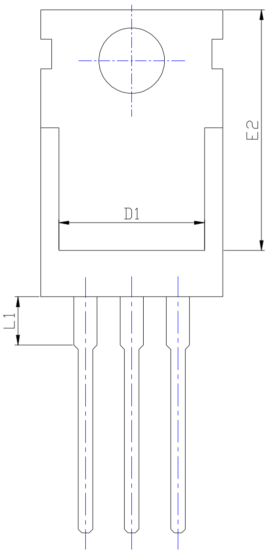
■ TO-220AB-D Package information



TOP VIEW



SIDE VIEW



BACK VIEW

SYMBOL	DIMENSIONS INCHES MIN.	INCHES MAX.	Millimeter MIN.	Millimeter MAX.
A1	0.091	0.098	2.300	2.500
A2	0.175	0.183	4.450	4.650
b	0.030	0.033	0.750	0.850
b2	0.048	0.052	1.220	1.320
c	0.018	0.022	0.450	0.550
c2	0.050	0.052	1.270	1.330
D	0.386	0.402	9.800	10.200
D1	0.303	0.327	7.700	8.300
E	0.614	0.630	15.600	16.000
E1	0.360	0.372	9.150	9.450
E2	0.510	0.533	12.950	13.550
E3	0.110BSC		2.800BSC	
e	0.200BSC		5.080BSC	
e1	0.100BSC		2.540BSC	
L	0.506	0.518	12.850	13.150
L1	0.093	0.117	2.360	2.960
⌀	0.138	0.146	3.500	3.700

NOTE:
1.PACKAGE BODY SIZES EXCLUDE MOLD FLASH AND GATE BURRS.
2.TOLERANCE 0.1mm UNLESS OTHERWISE SPECIFIED.

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