SSCJ56N650GTF

N-Channel 650V Super Junction Power MOSFET

➢ Features

V_{DS}	$R_{DS(ON)}$ Typ.	I_D
650V	56mΩ@10V	55A

➢ Description

- Low ON Resistance
- Improved dv/dt Capability
- Intrinsic Fast-Recovery Body Diode
- Fast switching capability
- 100% Avalanche Tested
- RoHS compliant

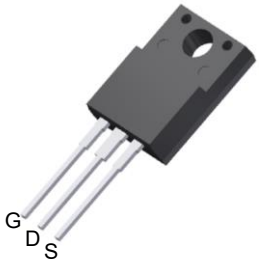
➢ Applications

- EV Charger
- Sever/Telecom/PC Power
- AC-DC Power Management
- Solar Inverte

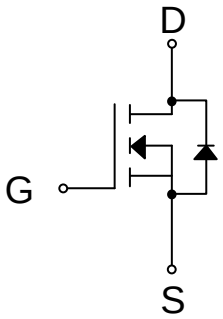
➢ Ordering Information

Device	Package	Shipping
SSCJ56N650GTF	TO220F-3L	50/Tube

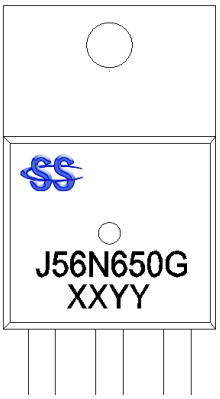
➢ Pin Configuration



TO220F-3L (Top View)



Pin Configuration



Marking

(XXYY: Internal Traceability Code)

➢ Absolute Maximum Ratings (T_J=25℃ unless otherwise noted)

Symbol	Parameter	Ratings	Unit
V_{DSS}	Drain-to-Source Voltage	650	V
V_{GSS}	Gate-to-Source Voltage (dynamic)	±30	
I_D	Continuous Drain Current T_J=25℃	55	A
I_{DM}	Pulsed Drain Current	165	A
dv/dt	MOSFET dv/dt Ruggedness(VDS=0~480V)	50	V/ns
T_{STG} /T_J	Junction & Storage Temperature Range	-55 to 150	℃

➢ Thermal Resistance Ratings (T_J=25℃ unless otherwise noted)

Symbol	Parameter	Ratings	Unit
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient[c]	66	℃/W
$R_{\theta JC}$	Thermal Resistance, Junction to Case	3.0	

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

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	650			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 650V, V_{GS} = 0V			10	μA
Gate-Source Leak Current	I_{GSS}	V_{GS} = ±30V, V_{DS} = 0V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 1mA	3	4	5	V
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS} = 10V, I_D = 20A		56	68	mΩ
Input Capacitance	C_{ISS}	V_{DS} = 50V, V_{GS} = 0V, f = 1MHz		4528		pF
Output Capacitance	C_{OSS}			414		
Reverse Transfer Capacitance	C_{RSS}			3		
Total Gate Charge	Q_G	V_{GS} = 0 to 10V, V_{DS} = 400V, I_D =17.1A		94		nC
Gate to Source Charge	Q_{GS}			25		
Gate to Drain Charge	Q_{GD}			35		
Turn-on Delay Time	$T_{D(ON)}$	V_{GS} = 13V, V_{DS} = 400V, I_D =17.1A, R_G = 5.3Ω		22		ns
Rise Time	T_r			11		
Turn-off Delay Time	$T_{D(OFF)}$			87		
Fall Time	T_f			9		
Drain to Source Diode Forward Voltage	V_{SD}	VGS = 0V		0.88	1.2	V

➢ Typical Performance Characteristics (T_J=25℃ unless otherwise noted)

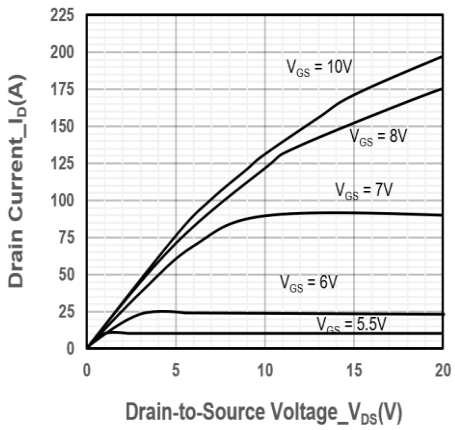


Figure 1: Output Characteristics

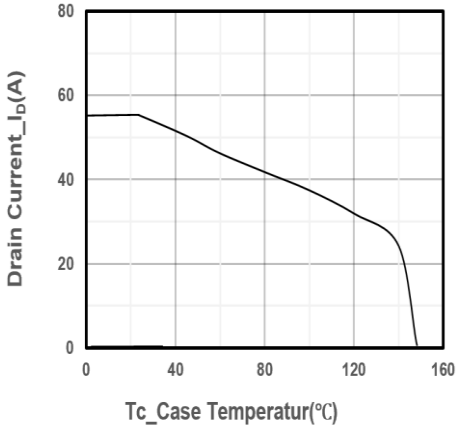


Figure 2: Drain current De-rating

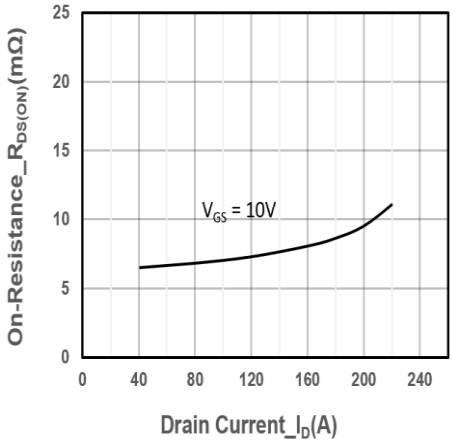


Figure 3: RDS(ON) vs Drain Current

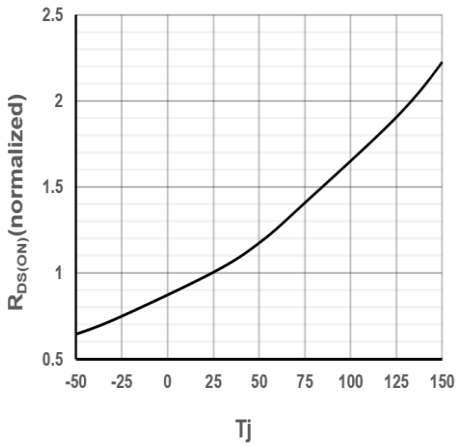


Figure 4: RDS(ON) vs junction temperature

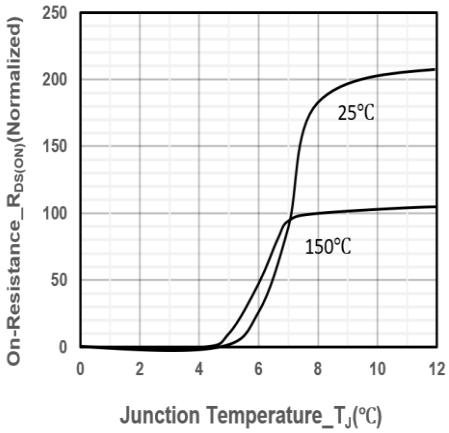


Figure 5: Transfer characteristics

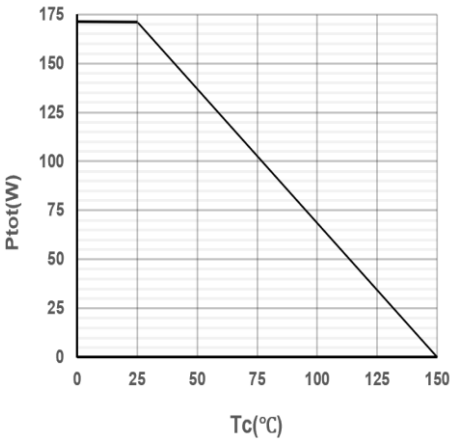


Figure 6: Power Dissipation

➢ Typical Performance Characteristics (T_J=25℃ unless otherwise noted)

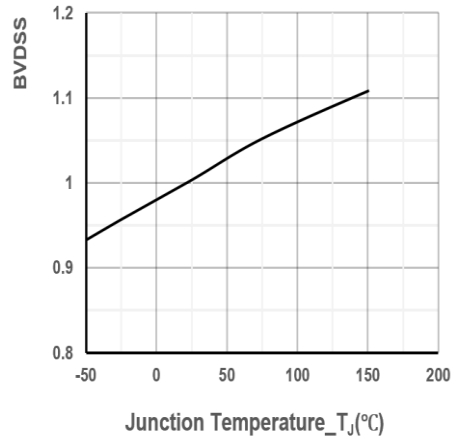


Figure 7: BVDSS voltage vs temperature

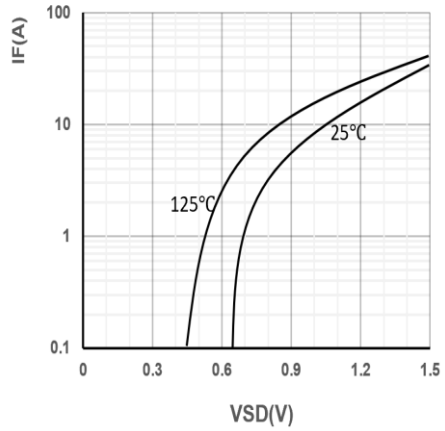


Figure 8: Source-Drain Diode Forward

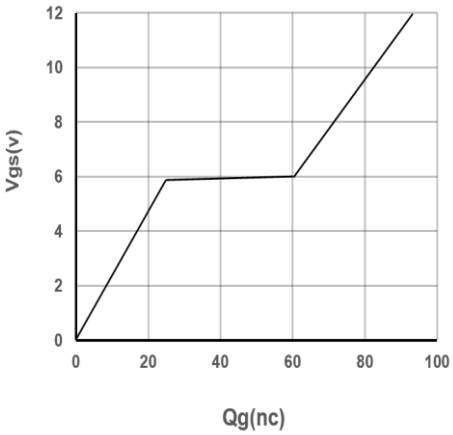


Figure 9: Gate charge

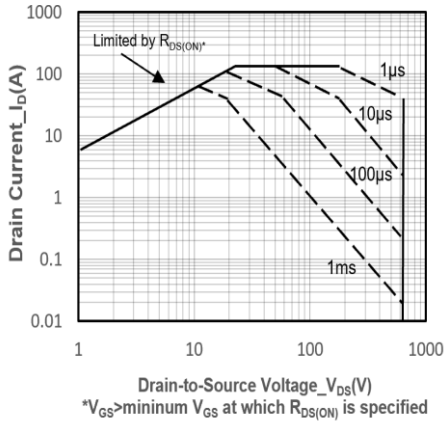
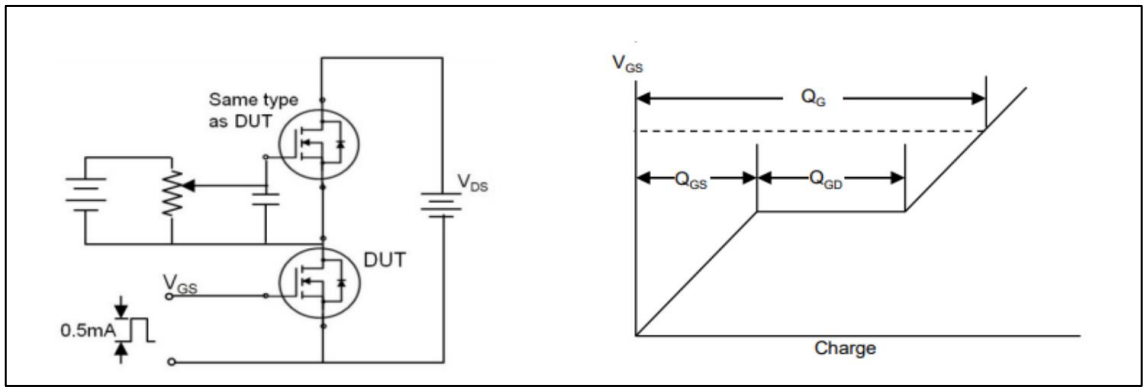


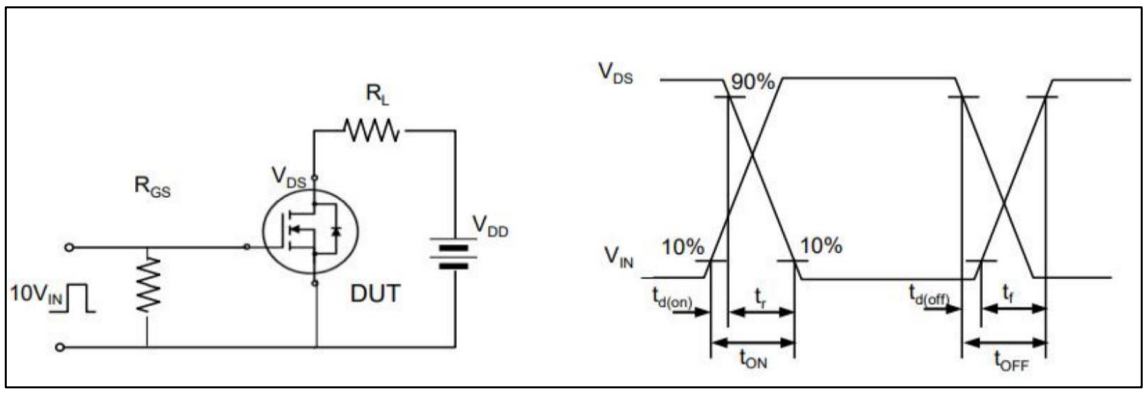
Figure 10: Safe operating area

➢ Test Circuits

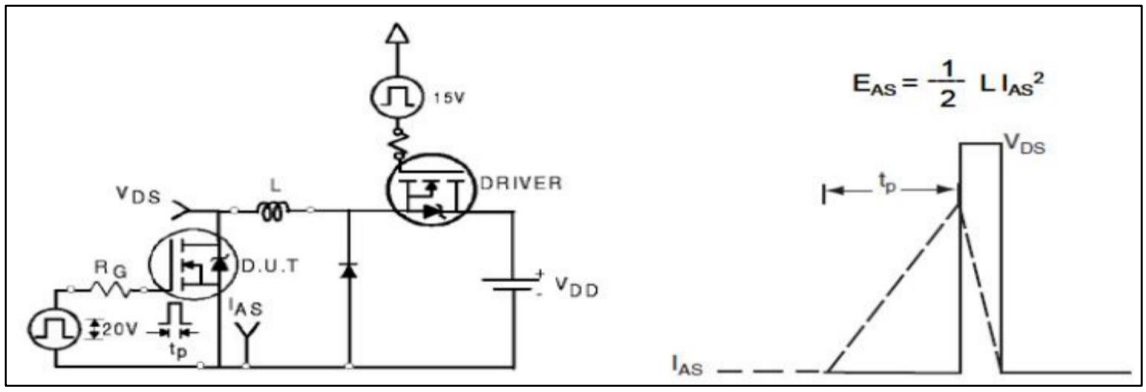
1. Gate charge test circuit & waveform



2. Switching time test circuit & waveform

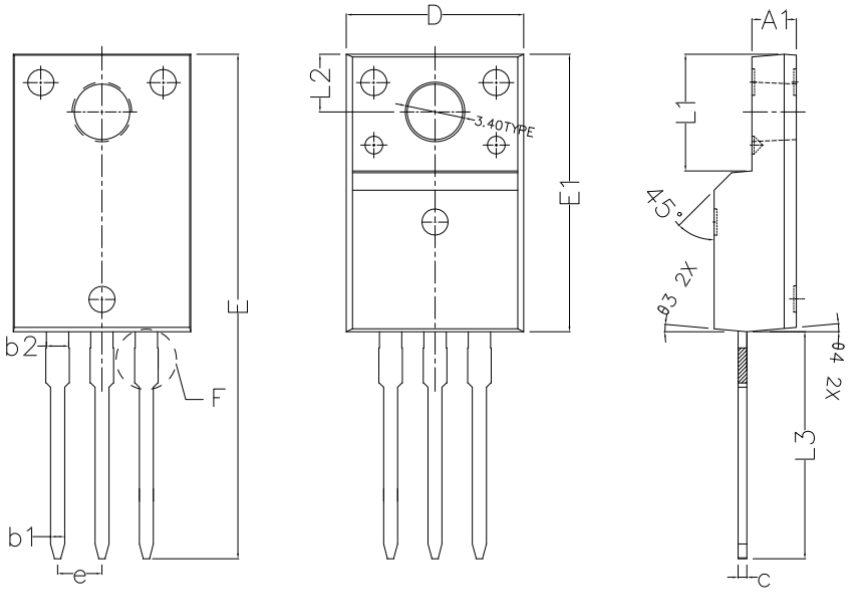


3. Unclamped Inductive switching test circuit & waveform



➢ Package Information

TO220F-3L



COMMON DIMENSIONS (UNITS OF MEASURE IS mm)			
	MIN	NORMAL	MAX
A1	2.440	2.540	2.640
A2	4.600	4.700	4.800
A3	2.730	2.830	2.930
b1	0.750	0.800	0.850
b2	1.230	1.280	1.330
c	0.450	0.500	0.550
D	10.060	10.160	10.260
E	28.650	28.850	29.050
E1	15.770	15.870	15.970
e	2.54TYPE		
L1	6.68REF		
L2	3.30REF		
L3	12.830	12.980	13.130
θ1	5° TYPE		
θ2	5° TYPE		
θ3	5° TYPE		
θ4	5° TYPE		

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