Super Junction MOSFETs

Lead Free Package and Finish

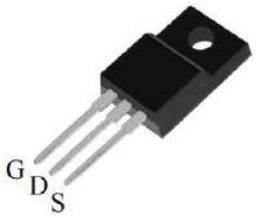
I_D	$R_{DS(ON)}$(Max.)	V_{DSS}
7A	650mΩ	650V

Applications:

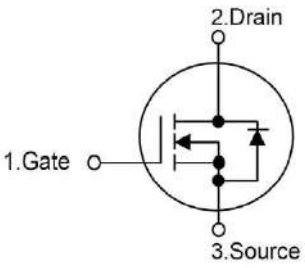
- Switch Mode Power Supply(SMPS)
- Uninterruptible Power Supply(UPS)
- PFC stages for server & telecom
- Consumer

Features:

- New revolutionary high voltage technology
- Better RDS(on) in TO-220F
- Ultra Low Gate Charge cause lower driving requirements
- Periodic avalanche rated
- Ultra low effective capacitances



Not to Scale



Ordering Information

Part Number	Package	Marking
RSU7N65F	TO-220F	RSU7N65F

Absolute Maximun Ratings Tc=25℃ unless otherwise specified

Symbol	Parameter	RSU7N65F	Units
V_{DSS}	Drain-to-Source Voltage	650	V
I_D	Continuous Drain Current (TC = 25℃)	7	A
	Continuous Drain Current (TC = 100℃)	4	
I_{DM}	Pulsed Drain Current (Note*1)	21	
P_D	Power Dissipation(Tc=25℃)	32	W
V_{GS}	Gate-to-Source Voltage	±30	V
E_{AS}	Single Pulse Avalanche Engergy (Note*2)	120	mJ
I_{AR}	Avalanche Current pulse width limited by maximum junction temperature.	1.2	A
T_L T_{PKG}	Maximum Temperature for Soldering Leads at 0.063in(1.6mm)from Case for 10 seconds Package Body for 10 seconds	300 260	℃
T_J and T_{STG}	Operating Junction and Storage Temperature Range	-55 to 150	

*Drain Current Limited by Maximum Junction Temperature

Caution:Stresses greater than those listed in the"Absolute Maximum Ratings"Table may cause permanent damage to the device.

Thermal Resistance

Symbol	Parameter	RSU7N65F	Units	Test Conditions
RθJC	Junction-to-Case	4	℃/W	Drain lead soldered to water cooled heatsink,PD Adjusted for a peak junction temperature of +150℃.
RθJA	Junction-to-Ambient	68		1 cubic foot chamber,free air.

OFF Characteristics TJ=25℃ unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
BVDSS	Drain-to-source Breakdown Voltage	650	--	--	V	VGS = 0V, ID = 250μA, TJ= 25℃
		--	650	--	V	VGS = 0V, ID = 250μA, TJ= 150℃
IDSS	Drain-to-Source Leakage Current	--	--	1.0	μA	VDS=650V,VGS=0V
IGSS	Gate-to-Source Forward Leakage	--	--	100	nA	VGS=+30V VDS=0V
	Gate-to-Source Reverse Leakage	--	--	-100		VGS=-30V VDS=0V

ON Characteristics TJ=25℃ unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
RDS(on)	Static Drain-to-Source On-Resistance	--	560	650	mΩ	VGS=10V,ID=3.5A
VGS(TH)	Gate Threshold Voltage	2.5	--	4.0	V	VGS=VDS,ID=250μA

Resistive Switching Characteristics Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
td(ON)	Turn-on Delay Time	--	11.6	--	ns	VDS=400V ID=3.5A RG=25Ω VGS=10V
trise	Rise Time	--	23	--		
td(OFF)	Turn-OFF Delay Time	--	53			
tfall	Fall Time	--	35.8			

Dynamic Characteristics Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
Ciss	Input Capacitance	--	493	--	pF	VGS=0V VDS=100V f=1.0MHz
Coss	Output Capacitance	--	32	--		
Crss	Reverse Transfer Capacitance	--	1.6	--		
Qg	Total Gate Charge	--	2.8	--	nC	VDS=520V ID=3.5A VGS=10V
Qgs	Gate-to-Source Charge	--	4.7	--		
Qgd	Gate-to-Drain("Miller"）Charge	--	13.3	--		

Source-Drain Diode Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
IS	Continuous Source Current	--	--	7	A	Integral pn-diode in MOSFET
ISM	Maximum Pulsed Current	--	--	21	A	
VSD	Diode Forward Voltage	--	0.85	--	V	IS=3.5A,VGS=0V Tj=25℃
trr	Reverse Recovery Time	--	201	--	nS	VR=50V,VGS=0V IS=3.5A,di/dt=100A/μs
Qrr	Reverse Recovery Charge	--	1.3	--	μC	
Irrm	Peak Reverse Recovery Current	--	11.5	--	A	

Notes:

*1.Repetitive rating;pulse width limited by maximum junction temperature.
*2. Pulse width tp limited by Tj,max

ElectricalCharacteristicsDiagrams

Figure1.OutputCharacteristics

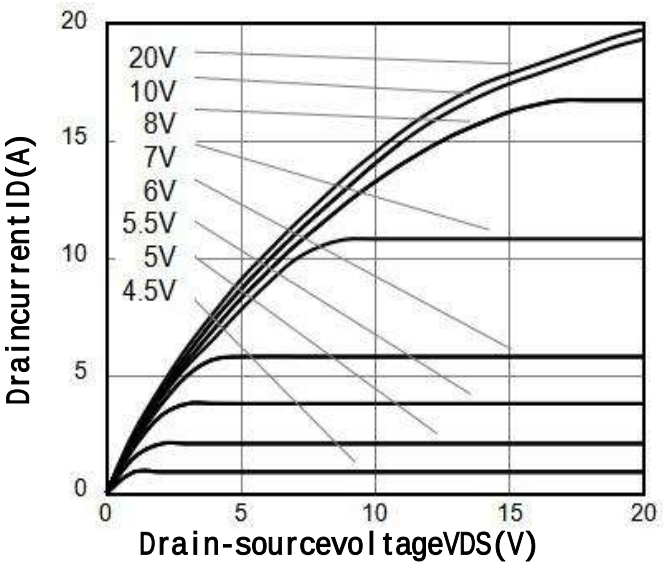


Figure2.TransferCharacteristics

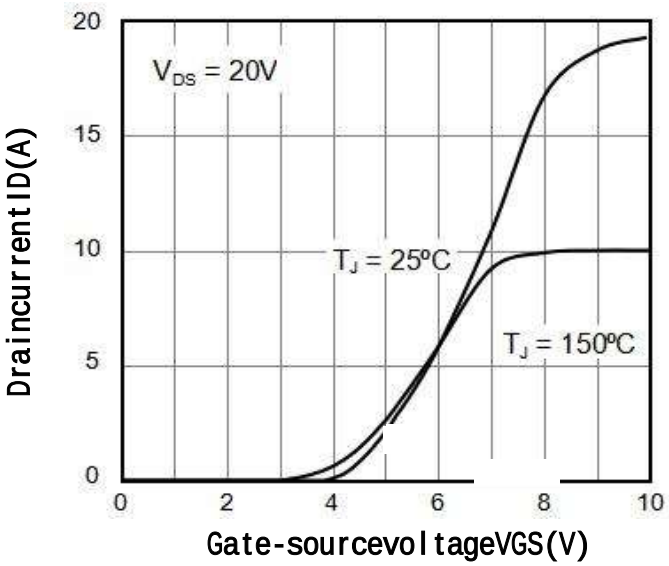


Figure3.On-Resistancevs.DrainCurrent

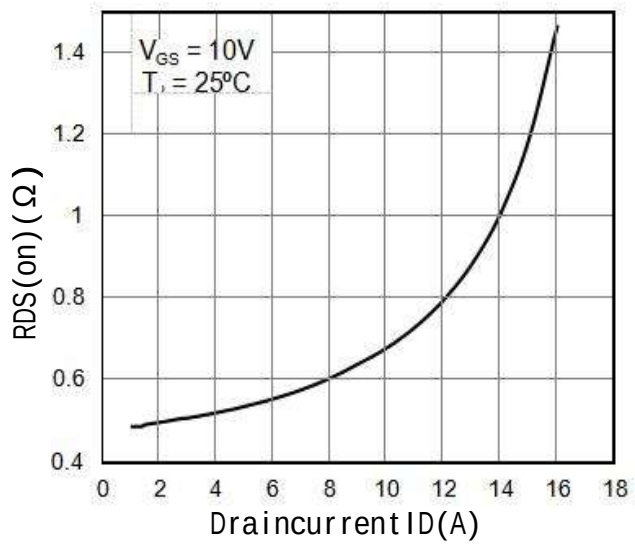


Figure4.CapacitanceCharacteristics

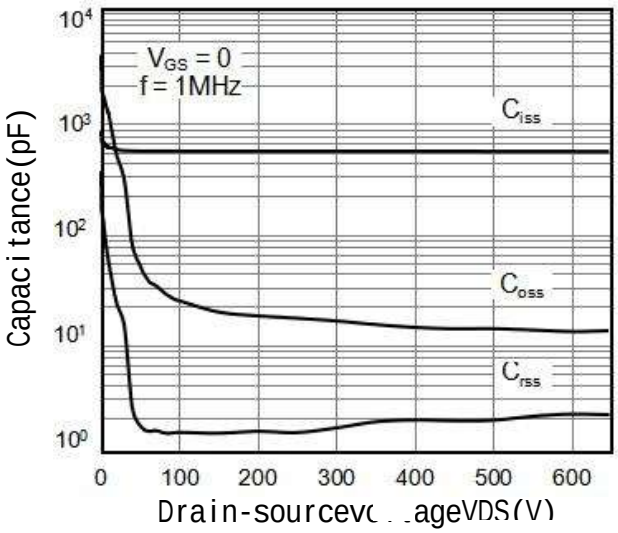


Figure5.GateChargeCharacteristics

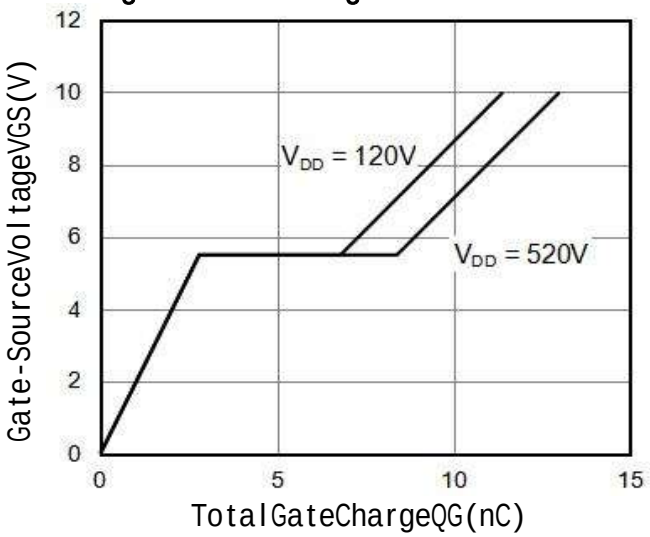


Figure6.BodyDiodeForwardVoltage

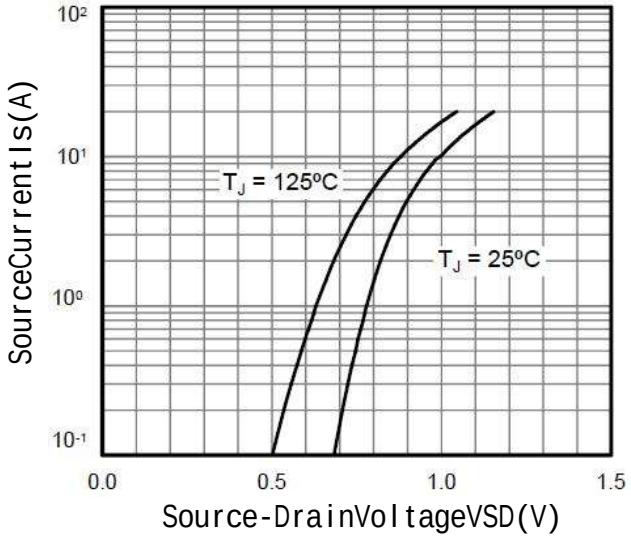


Figure7.BreakdownVoltagevs.Temperature

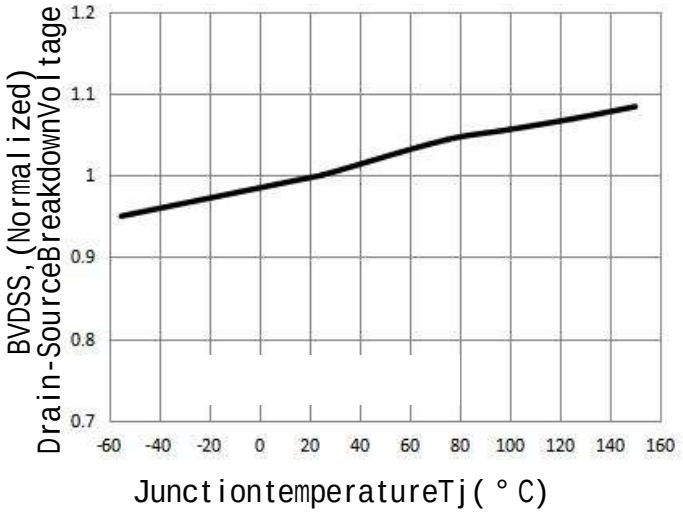


Figure8.On-Resistancevs.Temperature

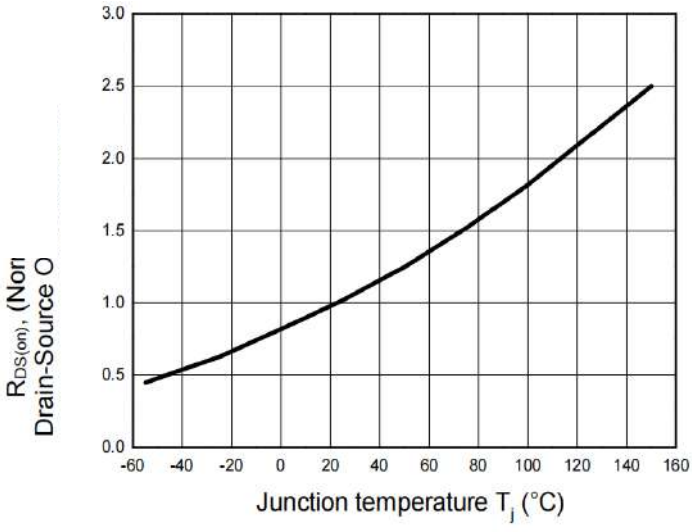
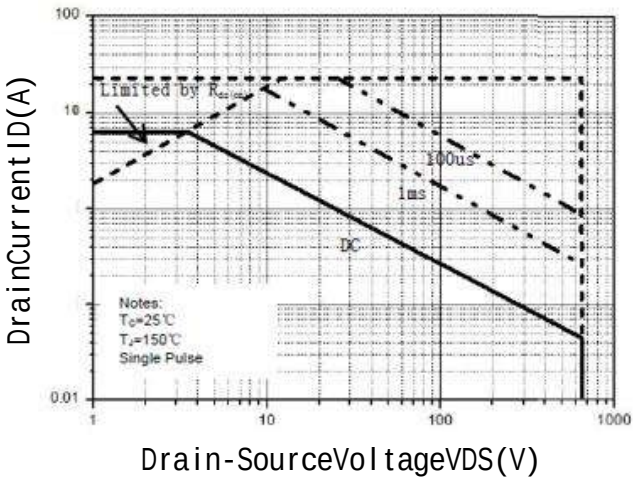
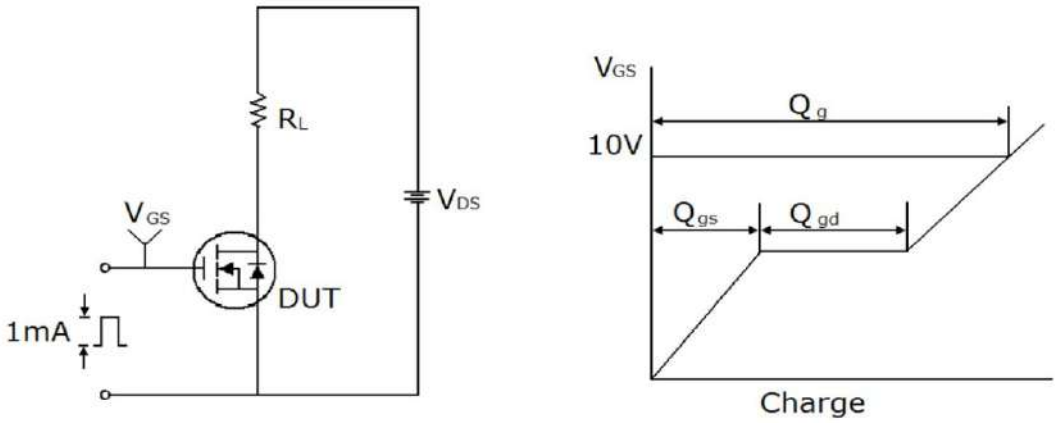


Figure9.MaximumSafeOperatingArea

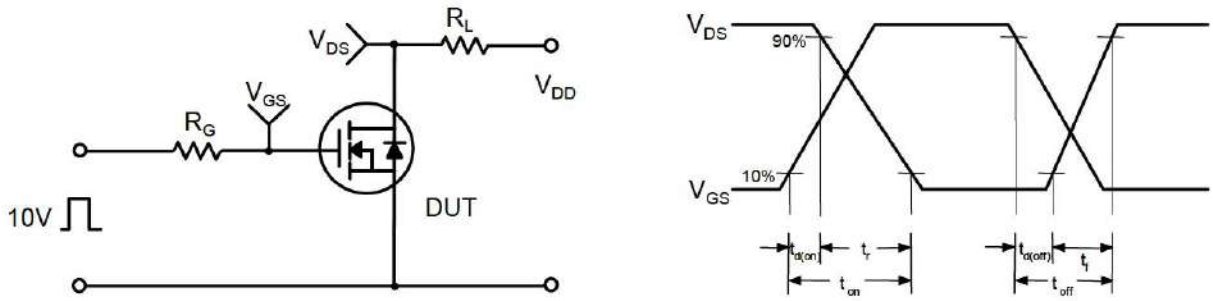


Test Circuits and Waveforms

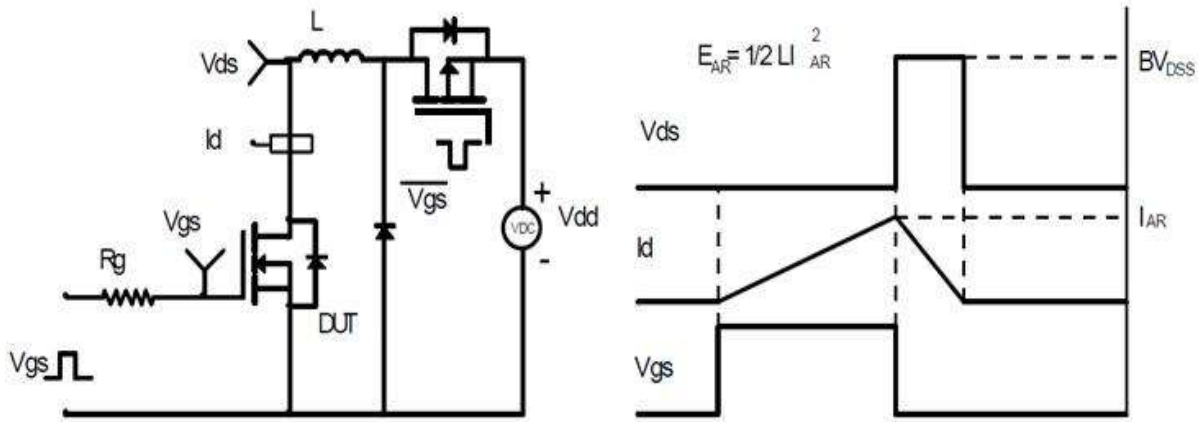
GateChargeTestCircuit&Waveform



SwitchingTestCircuit&Waveform



UnclampedInductiveSwitchingTestCircuit&Waveform



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