



TSF65R300

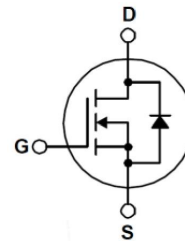
650V N-Channel MOSFET

Description

The 65R300 is power MOSFET using Truesemi's advanced super junction technology that can realize very low on-resistance and gate charge. It will provide much high efficiency by using optimized charge coupling technology. These user friendly devices give an advantage of Low EMI to designers as well as low switching loss.

Features

- 15A,650V,Max.RDS(on)=0.3Ω @ VGS =10V
- Super_Junction technology
- Much lower Ron*A performance for On-state efficiency
- Much lower FOM for fast switching efficiency



Absolute Maximum Ratings

T_C=25°C unless otherwise specified

Symbol	Parameter		Value	Units
V _{DSS}	Drain-Source Voltage		650	V
V _{GS}	Gate-Source Voltage		± 30	V
I _D	Drain Current	T _C = 25°C	15	A
		T _C = 100°C	11	A
I _{DM}	Pulsed Drain Current (T _C = 25°C, tp limited by T _{Jmax})		60	A
E _{AS}	Avalanche energy, single pulse (L=60mH, Rg=30Ω)		120	mJ
P _D	Power Dissipation (T _C = 25°C)		26	W
T _J , T _{STG}	Operating and Storage Temperature Range		-55 to +150	°C

Thermal Resistance Characteristics

Symbol	Parameter	Value	Units
R _{θJC}	Thermal Resistance,Junction-to-Case.Max	4.89	°C/W
R _{θJA}	Thermal Resistance,Junction-to-Ambient.Max	78	°C/W

Electrical Characteristics $T_C=25\text{ }^{\circ}\text{C}$ unless otherwise specified

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
On Characteristics						
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = 250 uA	3.0	--	4.0	V
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} = 10 V, I _D =7.5 A	--	0.24	0.30	Ω
g _{fs}	Forward transfer conductance	V _{DS} = 20V, I _D = 7.5A	--	16	--	S
Off Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} = 0 V, I _D = 250 uA	650	--	--	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 650 V, V _{GS} = 0 V	--	--	1	uA
		V _{DS} = 650 V, T _C = 150℃	--	10	--	uA
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} = 100V, V _{GS} = 0 V, f = 1.0 MHz	--	771	--	pF
C _{oss}	Output Capacitance		--	45	--	pF
C _{rss}	Reverse Transfer Capacitance		--	28	--	pF
Switching Characteristics						
t _{d(on)}	Turn-On Time	T _j =25℃, V _{GS} =10V, I _D =7.5A, V _{DS} =400V, R _g =25Ω	--	41	--	ns
t _r	Turn-On Rise Time		--	38	--	ns
t _{d(off)}	Turn-Off Delay Time		--	177	--	ns
t _f	Turn-Off Fall Time		--	17	--	ns
R _G	Gate resistance	V _{GS} =0V, V _{DS} =0V, f=1MHz	--	2.2	--	Ω
Q _g	Total Gate Charge	V _{GS} =10V, V _{DS} =480V, I _D =7.5A, f=1MHz	--	24	--	nC
Q _{gs}	Gate-Source Charge		--	4.8	--	nC
Q _{gd}	Gate-Drain Charge		--	9.5	--	nC
Source-Drain Diode Maximum Ratings and Characteristics						
V _{SD}	Source-Drain Diode Forward Voltage	I _S =7.5A, V _{GS} = 0 V	0.5	0.86	1.0	V
t _{rr}	Reverse Recovery Time	I _{sd} =7.5A dI/dt=100A/us, V _{ds} =100V	--	260	--	ns
Q _{rr}	Reverse Recovery Charge		--	2.94	--	uC

Typical Performance Characteristics

Fig 1. Output Characteristics ($T_J=25^\circ\text{C}$)

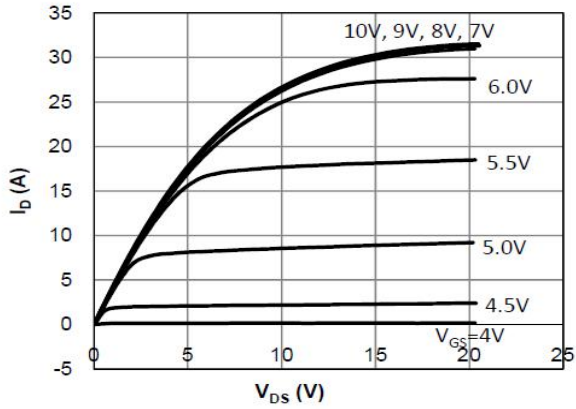


Fig 2. Output Characteristics ($T_J=150^\circ\text{C}$)

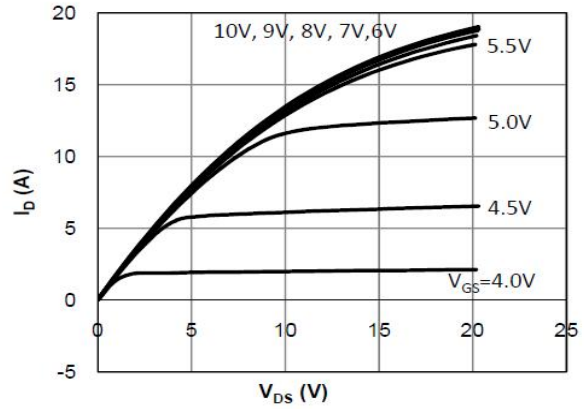


Fig 3: Transfer Characteristics

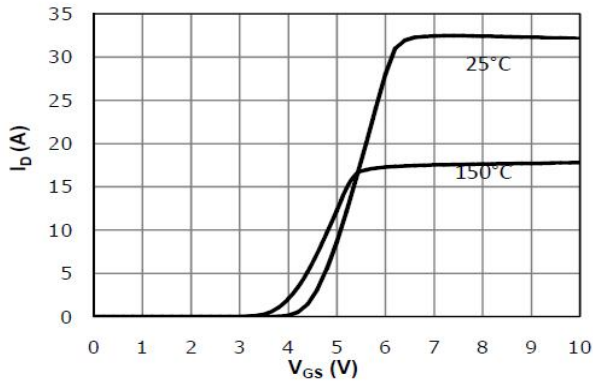


Fig 4: V_{TH} Vs T_J Temperature Characteristics

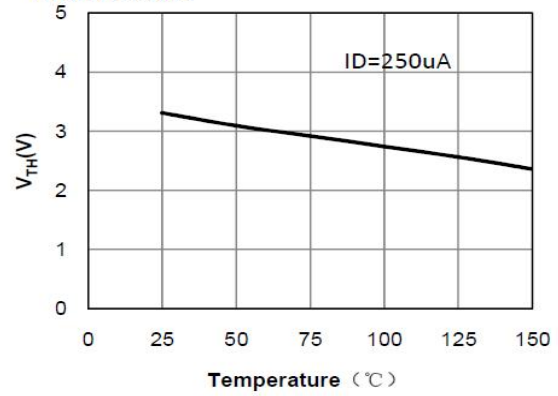


Fig 5: $R_{DS(on)}$ Vs I_{DS} Characteristics ($T_C=25^\circ\text{C}$)

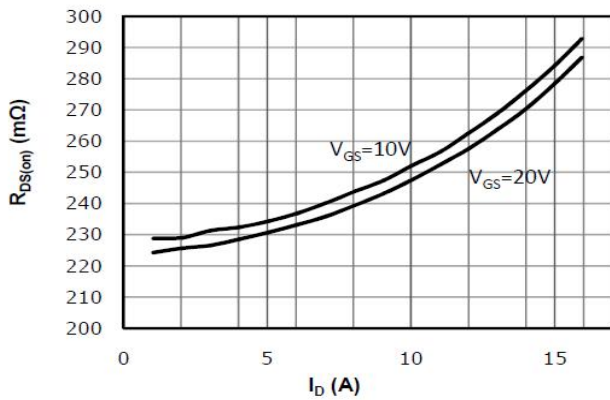


Fig 6: $R_{DS(on)}$ vs. Temperature

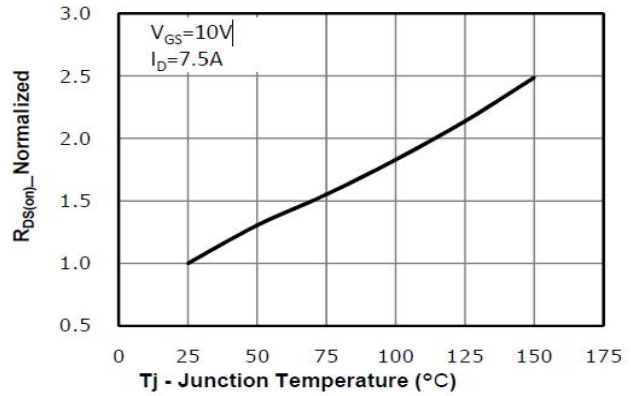


Fig 7: BVDSS vs. Temperature

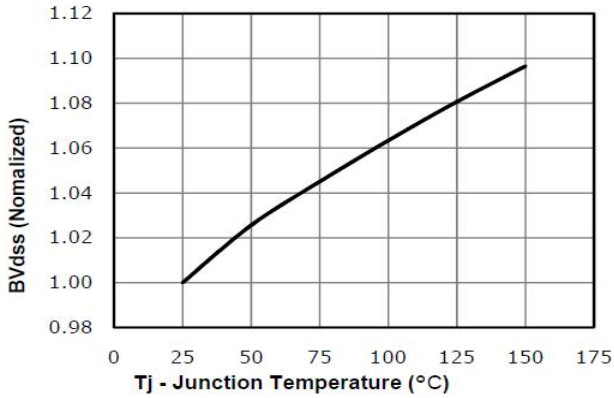


Fig 8: Rds(on) vs Gate Voltage

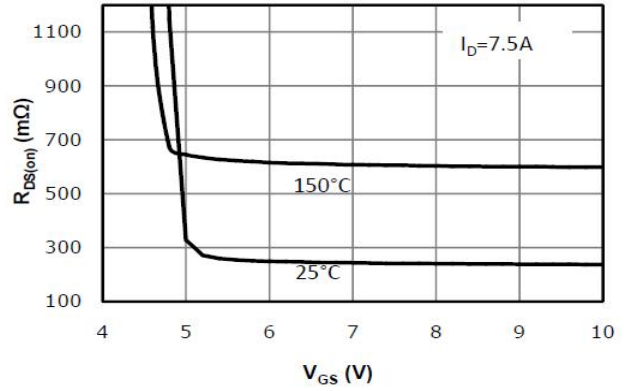


Fig 9: Body-diode Forward Characteristics

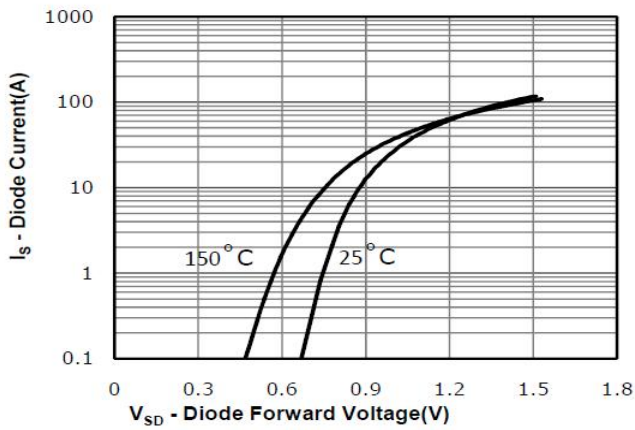


Fig 10: Gate Charge Characteristics

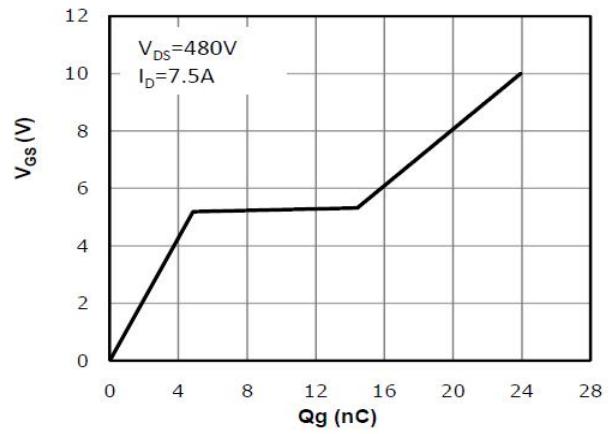


Fig 11: Capacitance Characteristics

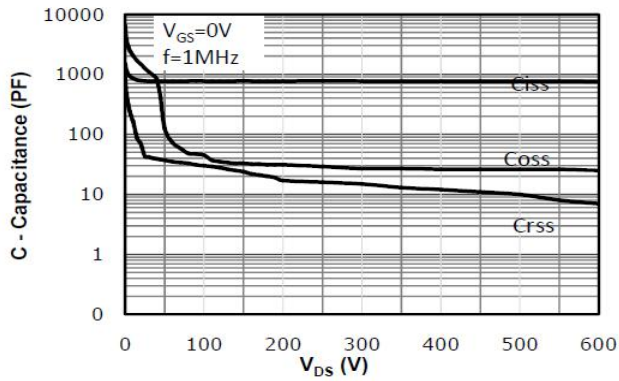


Fig 12: Safe Operating Area

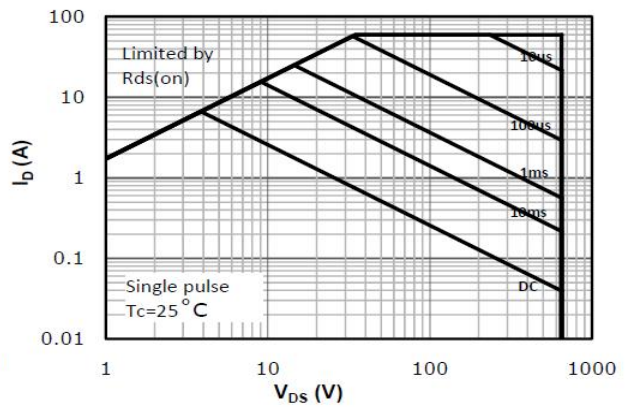
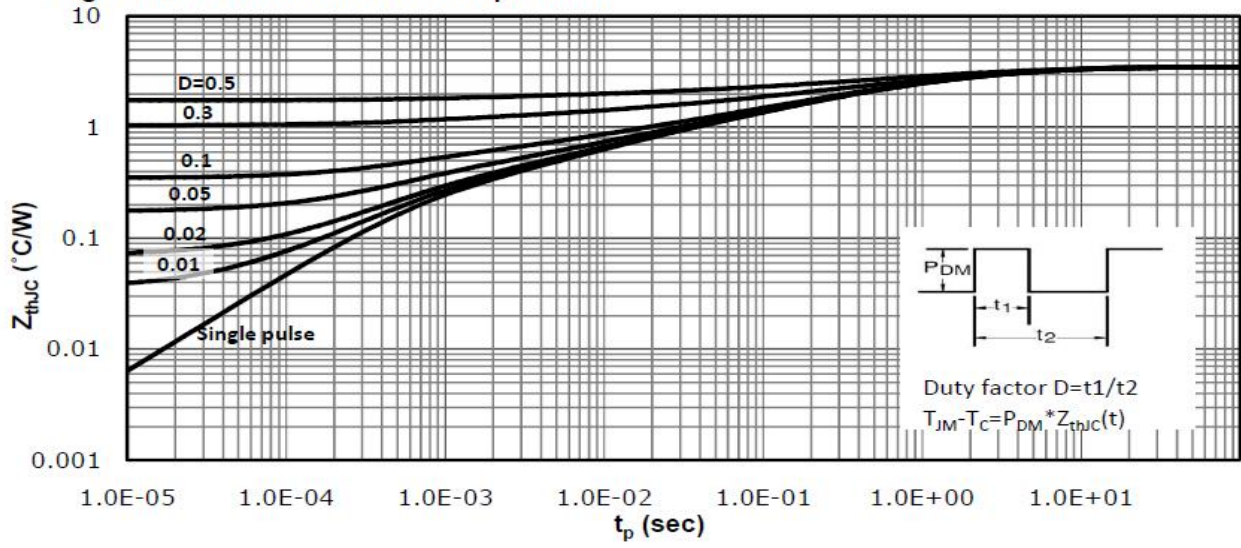
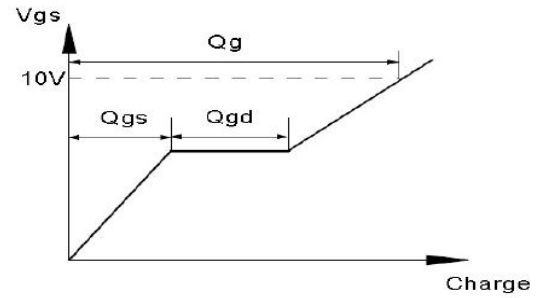
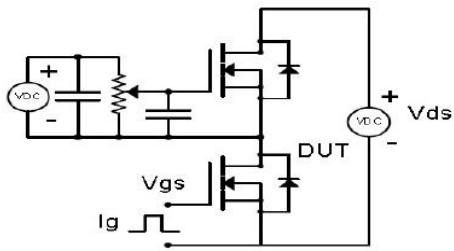


Fig 13: Max. Transient Thermal Impedance

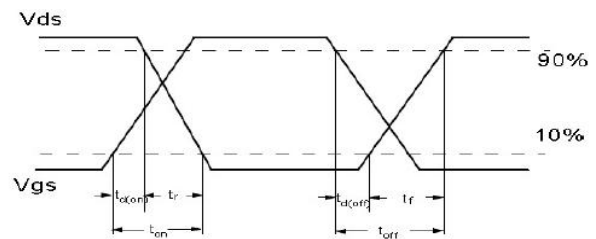
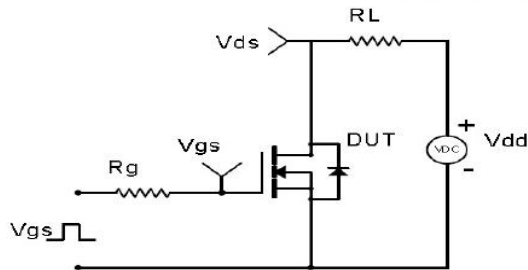


Test Circuit & Waveform

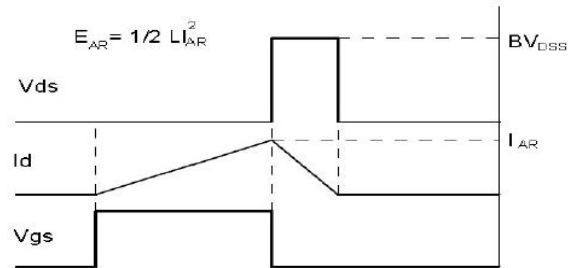
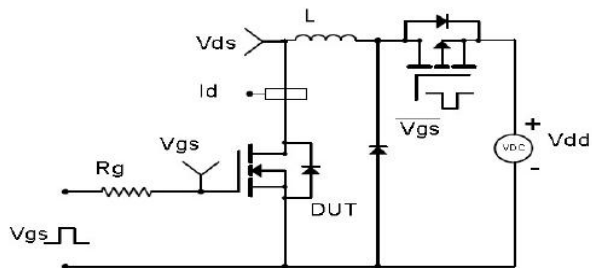
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms

