Prisemi®

PSJMTAF65R37

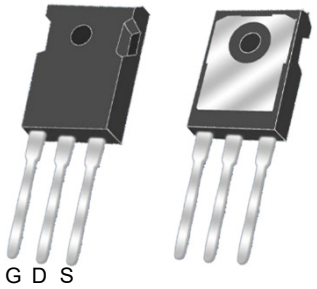
N-Channel MOSFET

Description

Supper Junction is a revolutionary technology for high voltage power MOSFETs.

Supper Junction MOSFET has low on resistor, low gate charge and makes specially switching power supply applications more reliable, more efficient, lighter and cooler.

MOSFET Product Summary		
V_{DS}(V)	$R_{DS(on)}$(mΩ)	I_D(A)
650	33@ V_{GS} = 10V	75



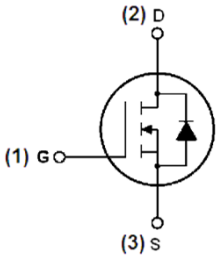
TO-247-3L

Feature

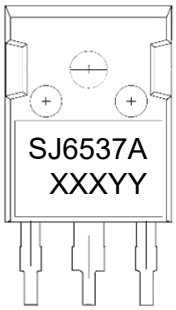
- Low FOM RDS(ON)×QG
- Fast Recovery Body Diode
- Extremely low losses due to very low Eon and Eoff
- Qualified for industrial grade applications according to JEDEC
- Excellent stability and uniformity

Applications

- SMPS
- EV Charger
- Telecom power
- Solar Inverter



Schematic diagram



Marking (Top View)

Absolute maximum rating@25℃

Parameter	Symbol	Conditions	Value	Unit
Continuous Drain Current[1)]	I_D	T_C = 25℃	75	A
		T_C = 100℃	48	
Pulsed Drain Current[2)]	$I_{D,pulse}$	T_C = 25℃	230	A
Avalanche Energy, Single Pulse	E_{AS}	V_{DD}=50V L=10mH	600	mJ
Avalanche Energy, Repetitive	E_{AR}	V_{DD}=50V L=10mH	6.0	mJ
Avalanche Current, Single Pulse	I_{AS}	Vdd=50V L=10mH	10.9	A
MOSFET dv/dt Ruggedness	dv/dt	V_{DS}=0-400V	50	V/ns
Gate Source Voltage (static)	V_{GS}	Static	±20	V
Gate Source Voltage (dynamic)	V_{GS}	AC (f>1 Hz)	±30	V
Power Dissipation	P_{tot}	T_C = 25℃	430	W
Operating and Storage Temperature	T_J , T_{stg}	-	-55 to 150	°C
Continuous Diode Forward Current	I_S	T_C = 25℃	17	A
Diode Pulse Current[2)]	$I_{S,pulse}$	T_C = 25℃	230	A
Reverse Diode dIF/dt	dI_F/dt	V_{DS}=0-400V,I_{SD}≤ 75A,T_J=25℃	900	A/ns
Reverse Diode dV/dt	dV/dt	V_{DS}=0-400V,I_{SD}≤ 75A,T_J=25℃	50	V/ns

Thermal Resistance

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.29	℃/W
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62	℃/W

Electrical characteristics per line@25℃ (unless otherwise specified)

Parameter	Symbol	Conditions		Min.	Typ.	Max.	Units
Statistic Characteristics							
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS} = 0V,I_D = 1mA		650	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 650V,V_{GS} = 0V		-	-	10	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS} = ±30V,V_{DS} = 0V		-	-	±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS},I_D = 0.25mA		3.0	3.5	4.0	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=30A	T_J=25℃	-	33	37	mΩ
			T_J=150℃	-	80	-	
Gate Resistance	R_G	f=1MHz, Open drain		-	4.0	-	Ω
Dynamic Characteristics							
Input Capacitance	C_{lss}	V_{DS} = 50V,V_{GS} = 0V, f = 250kHz		-	4200	-	pF
Output Capacitance	C_{oss}			-	130	-	
Reverse Transfer Capacitance	C_{rss}			-	3.2	-	
Turn-on Delay Time	$t_{d(on)}$	V_{DD}= 400V, V_{GS}= 12V I_D = 30A, R_G = 3.3Ω		-	25	-	ns
Turn-on Rise Time	t_r			-	21	-	
Turn-Off Delay Time	$t_{d(off)}$			-	110	-	
Turn-Off Fall Time	t_f			-	4.0	-	
Total Gate Charge	Q_g	V_{DD} = 400V,I_D = 30A, V_{GS} = 0 to 10V		-	178	-	nC
Gate-Source Charge	Q_{gs}			-	25	-	
Gate-Drain Charge	Q_{gd}			-	106	-	
Gate Plateau Voltage	$V_{plateau}$			-	6.1	-	V
Reverse Diode Characteristics							
Diode Forward Voltage	V_{SD}	V_R=400V, I_F=30A dI_F/dt=300A/μs		-	-	1.3	V
Reverse Recovery Time	t_{rr}			-	110	-	ns
Reverse Recovery Charge	Q_{rr}			-	1.3	-	μC
Peak Reverse Recovery Current	I_{rrm}			-	-18	-	A

Notes:
1. The max Drain current rating is package limited.
2. Pulse width limited by maximum junction temperature.

Typical Characteristics

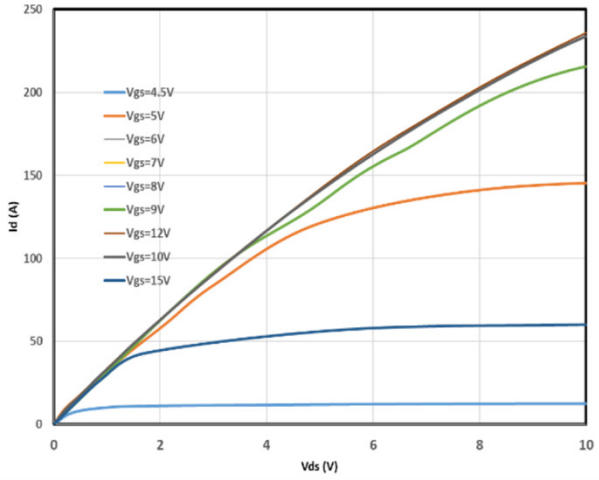


Fig.1 Typical Output characteristics (25°C)

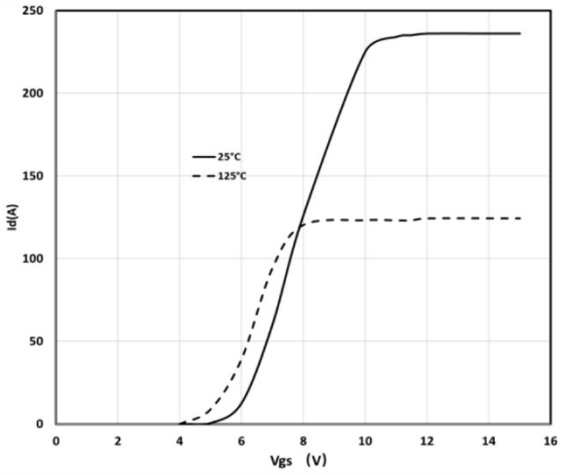


Fig.2 Transfer characteristics

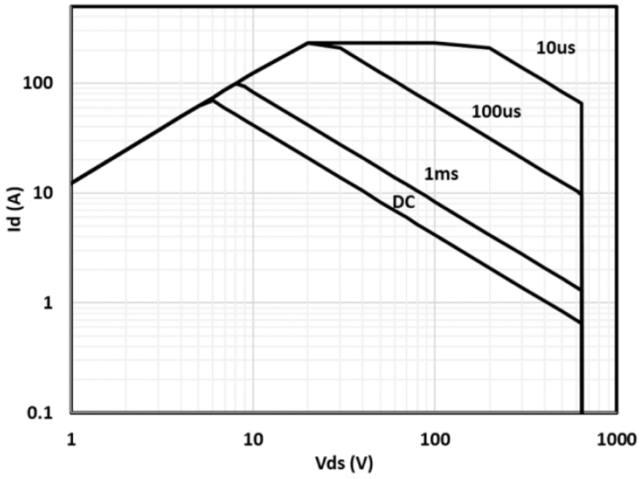


Fig.3 Safe Operating Area

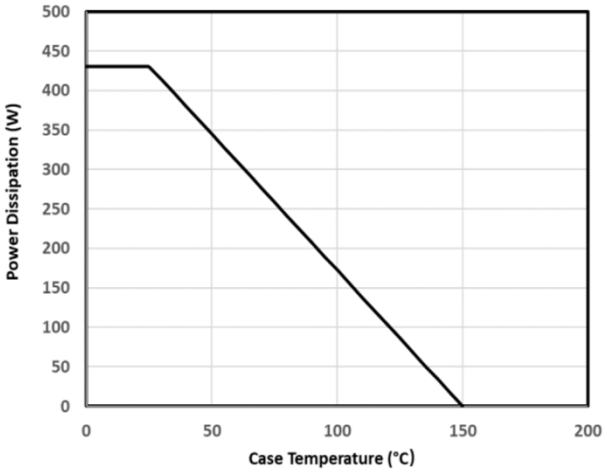


Fig.4 Power dissipation

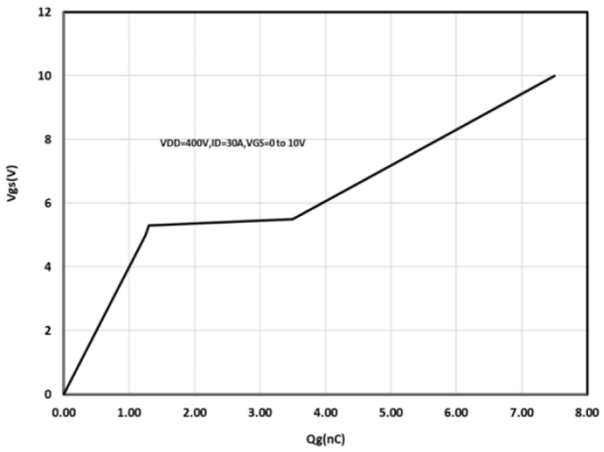


Fig.5 Gate charge

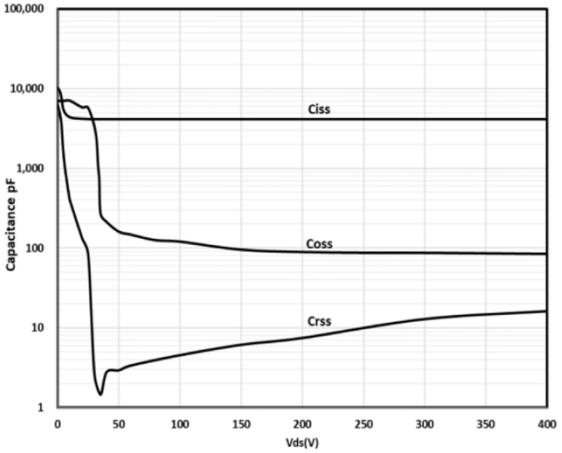


Fig.6 Typical capacitance characteristics

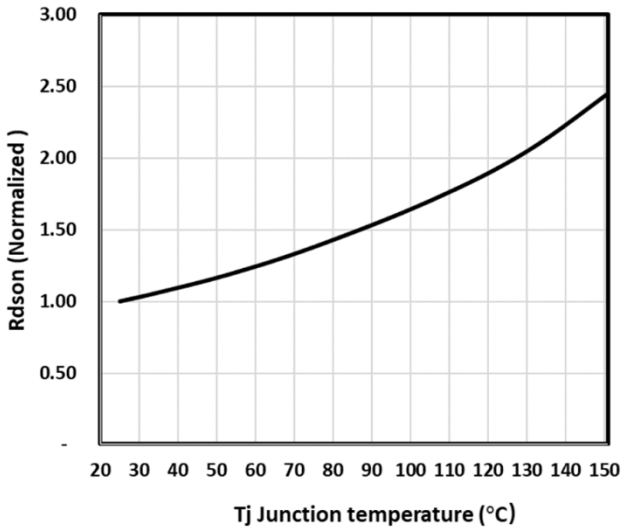


Fig.7 On Resistor vs. Junction temperature

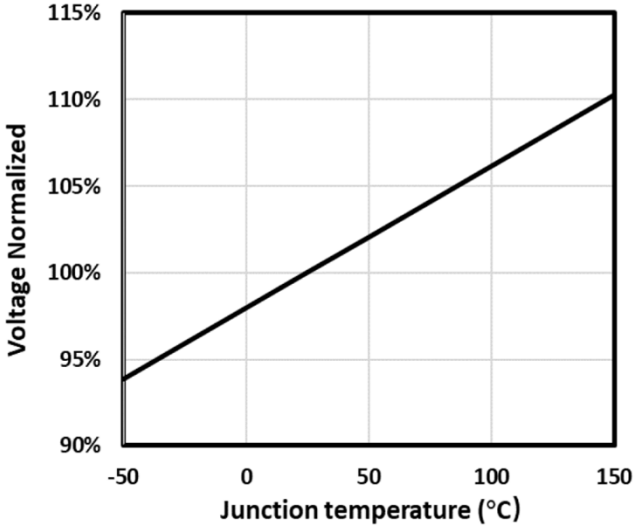


Fig.8 Drain-Source Breakdown Voltage

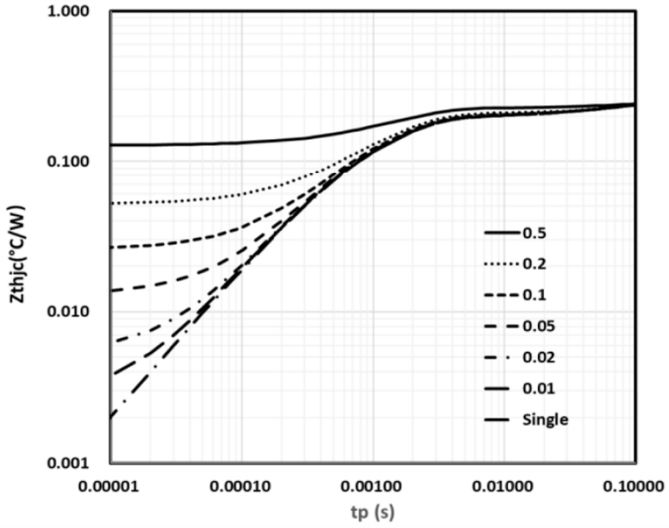
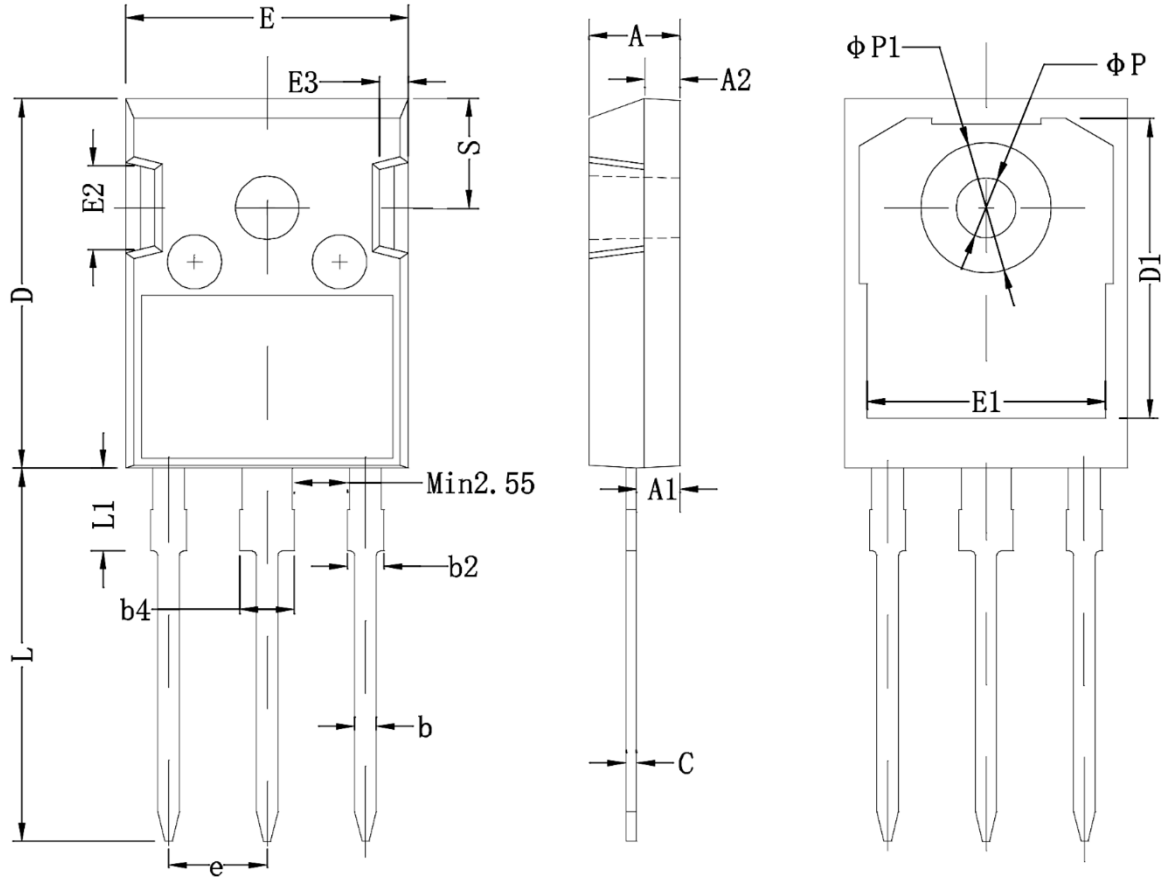


Fig.9 Transient thermal impedance

Product dimension (TO-247-3L)



Dim	Millimeters		Inches		Dim	Millimeters		Inches	
	Min	Max	Min	Max		Min	Max	Min	Max
A	4.80	5.20	0.189	0.205	E1	13.00	13.60	0.512	0.535
A1	2.21	2.59	0.087	0.102	E2	4.80	5.20	0.189	0.205
A2	1.85	2.15	0.073	0.085	E3	2.30	2.70	0.091	0.106
b	1.11	1.36	0.044	0.054	e	5.44 BSC.		0.214 BSC.	
b2	1.91	2.21	0.075	0.087	L	19.82	20.22	0.780	0.796
b4	2.91	3.21	0.115	0.126	L1	-	4.30	-	0.169
c	0.51	0.75	0.020	0.030	φP	3.40	3.80	0.134	0.150
D	20.80	21.30	0.819	0.839	φP1	-	7.30	-	0.287
D1	16.25	16.85	0.640	0.663	S	6.15 BSC.		0.242 BSC.	
E	15.50	16.10	0.610	0.634					

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