Features

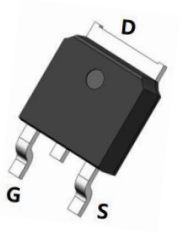
- N-channel SJ MOSFET with deep trench process
- Extremely low losses due to very low Eon and Eoff
- Qualified for industrial grade applications according to JEDEC
- Excellent stability and uniformity

Application

- SMPS
- Adapter
- LED lighting
- EV Charger
- Telecom power
- Solar Inverter

Key Performance Parameters

Parameter	Value	Unit
V_{DS}	650	V
I_D	13	A
$R_{DS(ON)\_max}$	380	mΩ



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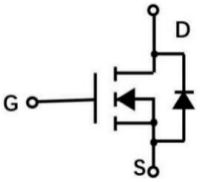


Equivalent Circuit

Table 1. Absolute Maximum Ratings (T_C=25°C unless otherwise specified)

Symbol	Parameter		Value	Units
V_{GS}	Drain-Source Voltage(static)		±20	V
V_{GS}	Gate-Source Voltage (dynamic)(AC (f>1Hz))		±30	
I_D	Continuous Drain Current	(T_C=25°C)	13	A
		(T_C=100°C)	8	
$I_{D,pulse}$	Pulsed Drain Current (T_C = 25°C)		24	
I_S	Continuous diode forward current	(T_C=25°C)	11	
$I_{S,pulse}$	Diode pulse current	(T_C=25°C)	25	
E_{AS}	Avalanche energy, single pulse(I_D=3.4A,V_{DD}=50 V)		320	mJ
I_{AS}	Avalanche current, single pulse		3.4	A
dv/dt	MOSFET dv/dt ruggedness (V_{DS}=0...400V)		50	V/ns
dv/dt	Recovery diode dv/dt(V_{DS}=0...400V,I_{SD}<=7A)		15	V/ns
P_{tot}	Power Dissipation	(T_C=25°C)	63	W
T_J ,T_{STG}	Operating Junction Storage Temperature Range		-55 to +150	°C

Table 2. Thermal Characteristic

Symbol	Parameter	Value			Units
		Min	Typ	Max	
R_{thJA}	Thermal resistance,junction – ambient	--	--	62	°C/ W
R_{thJC}	Thermal resistance,junction – case	--	--	1.9	°C/ W

Table 3. Electrical Characteristics (T_J=25°C unless otherwise specified)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS} = 0V, I_D = 1mA	650	--	--	V
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250μA	2.9	3.4	3.9	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 650V, V_{GS} = 0V, T_J = 25°C	--	--	1	μA
I_{GSS}	Gate to Source Leakage Current	V_{DS} = 0 V ,V_{GS} = ±30V	-100	±2	100	nA
$R_{DS(ON)}$	Drain-Source On-State Resistance	V_{GS} = 10V, I_D = 7A, T_J = 25°C	--	352	380	mΩ
		V_{GS} = 10V, I_D =7A, T_J = 150°C	--	704	--	
R_G	Gate Resistance	f = 1.0MHz,open drain	--	9	--	Ω
Dynamic Characteristics						
Ciss	Input Capacitance	V_{GS} = 0V,V_{DS} = 50V,f = 100kHz	--	410	--	pF
Coss	Output Capacitance		--	49	--	
Crss	Reverse Transfer Capacitance		--	3.9	--	
$t_{d(on)}$	Turn-on Delay Time	V_{DS} = 400 V, I_D = 5A V_{GS} = 15V, R_g = 10Ω	--	21	--	ns
t_r	Turn-on Rise Time		--	12	--	
$t_{d(off)}$	Turn-off Delay Time		--	36	--	
t_f	Turn-off Fall Time		--	13	--	
Q_g	Total Gate Charge	I_D = 5 A ,V_{DD}=400V V_{GS} = 0~10V	--	19	--	nC
Q_{gs}	Gate-Source Charge		--	4.1	--	
Q_{gd}	Gate-Drain Charge		--	9	--	
$V_{plateau}$	Gate plateau voltage		--	6	--	V
Body Diode Characteristics						
V_{SD}	Body Diode Forward Voltage	V_R= 400V I_F = 5 A, diF/dt = 100A/μs,	--	--	1.3	V
t_{rr}	Reverse Recovery Time		--	190	--	ns
Q_{rr}	Reverse Recovery Charge		--	2	--	μC
I_{rm}	Peak reverse recovery current		--	13	--	A

Typical Electrical and Thermal Characteristics (TJ = 25°C, unless otherwise noted)

Fig 1: Typical Outputcharacteristics (25°C)	Fig 2: Transfer characteristics

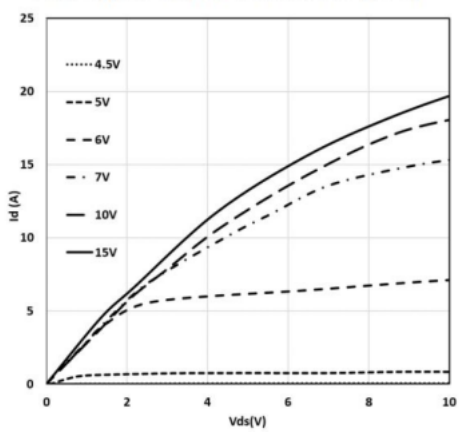
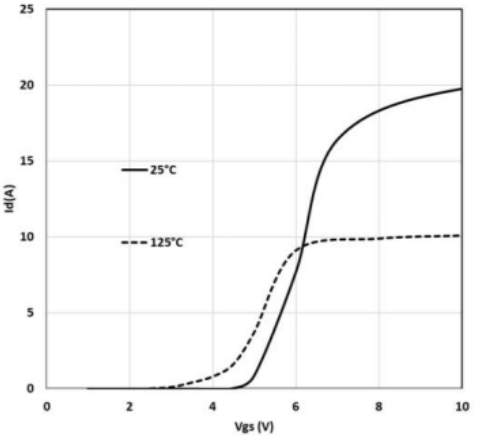

	

Fig 3: Safe Operating Area	**Fig 4: Powerdissipation**

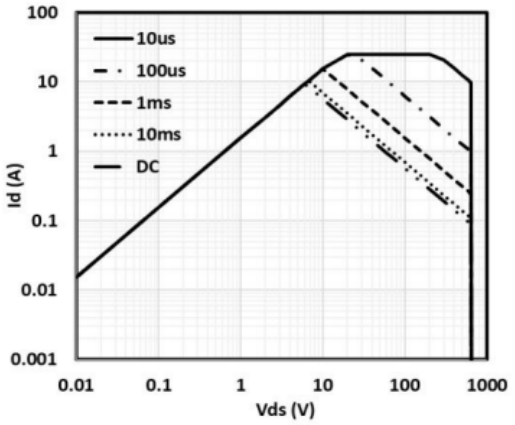
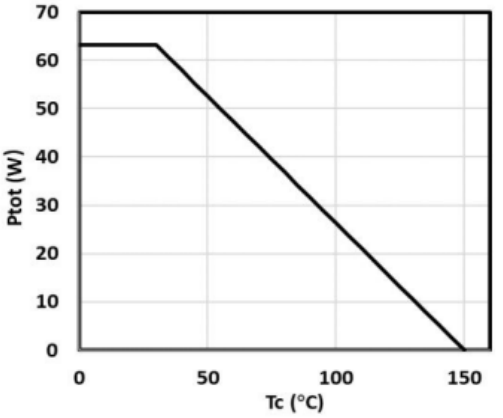

	

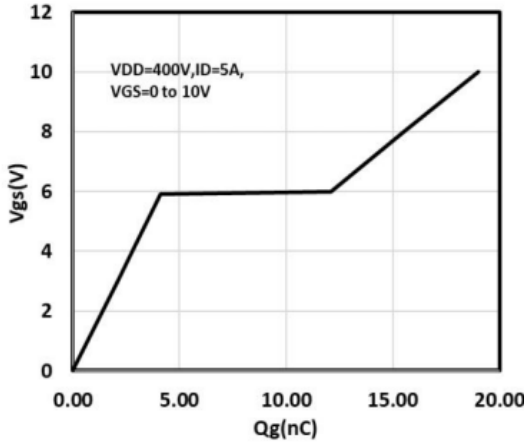
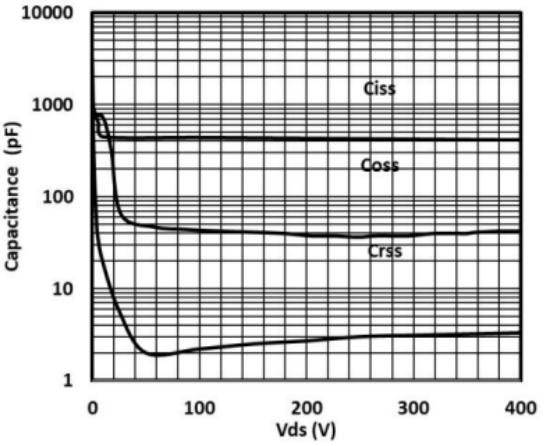
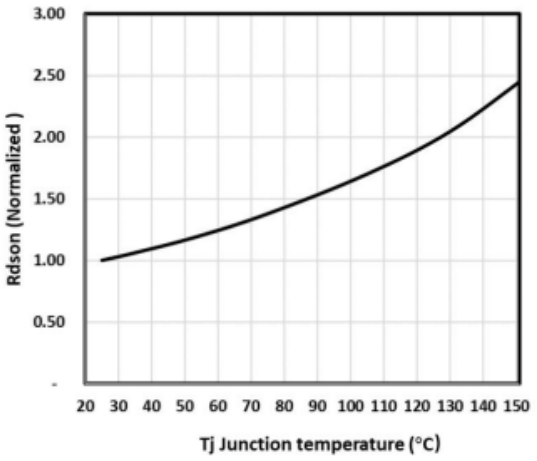
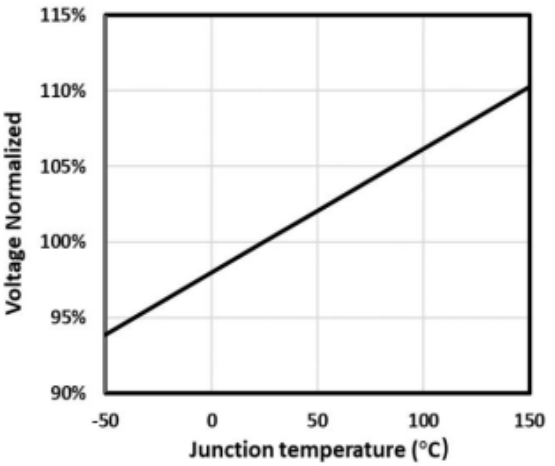
Fig 5: Gatecharge	**Fig 6: Typicalcapacitance characteristics**
	

Fig 7: On Resistor vs.Junction temperature	Fig 8: Drain-Source Breakdown Voltage
	

Test Circuit and Waveforms

Fig A: Switching Test Circuit & Waveforms

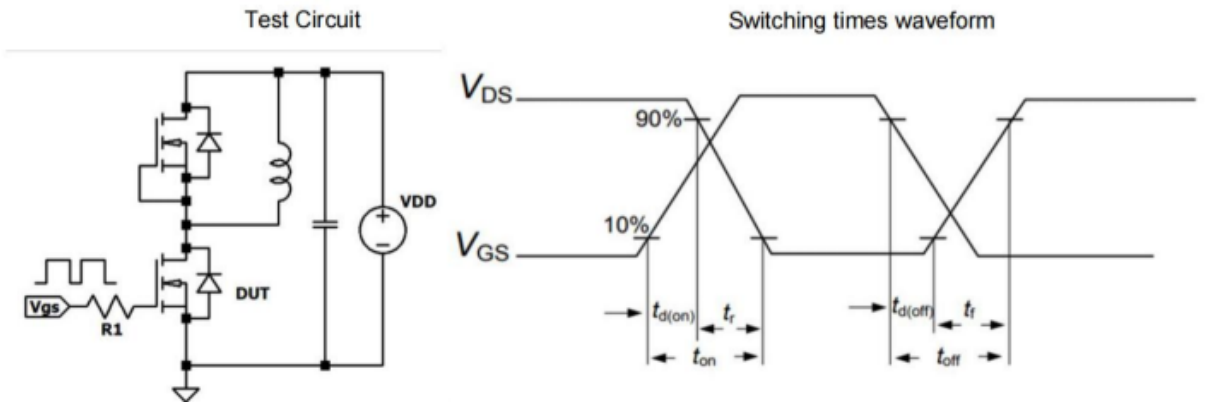
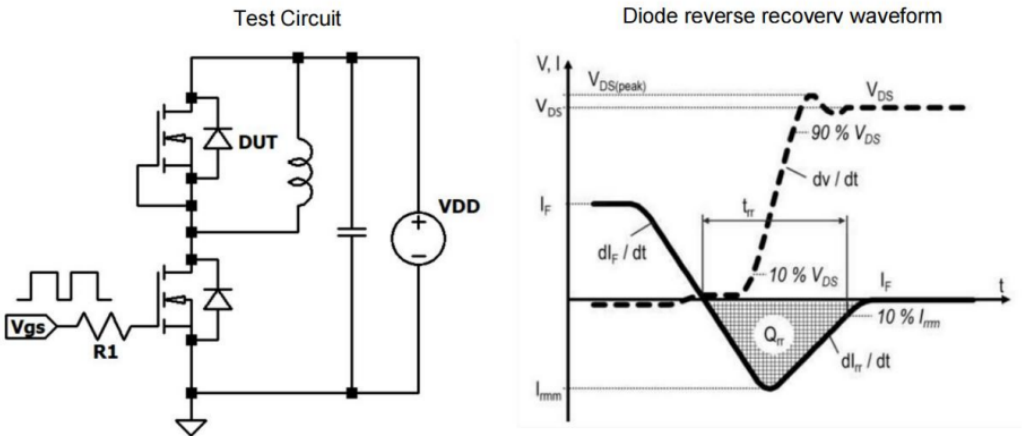


Fig B: Diode Recovery Test Circuit & Waveforms



Package Information

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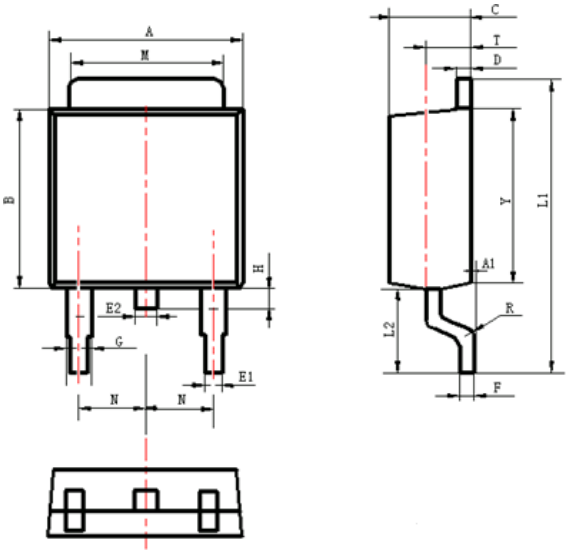

Items	Values(mm)	
	MIN	MAX
A	6.30	6.90
A1	0	0.16
B	5.70	6.30
C	2.10	2.50
D	0.30	0.70
E1	0.60	0.90
E2	0.70	1.00
F	0.30	0.60
G	0.70	1.20
L1	9.60	10.50
L2	2.70	3.10
H	0.40	1.00
M	5.10	5.50
N	2.09	2.49
R	0.3	
T	1.40	1.60
Y	5.10	6.30