

Features

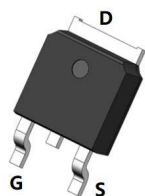
- N-channel SJ MOSFET with deep trench process
- Extremely low losses due to very low Eon and Eoff
- Qualified for industrial grade applications according to JEDEC
- Excellent stability and uniformity

Application

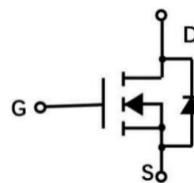
- SMPS
- Adapter
- LED lighting
- EV Charger
- Telecom power
- Solar Inverter

Key Performance Parameters

Parameter	Value	Unit
V_{DS}	650	V
I_D	14	A
$R_{DS(ON)_{typ}}$	250	mΩ



TO-252



Equivalent Circuit

Table 1. Absolute Maximum Ratings ($T_C=25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter		Value	Units
V_{GS}	Gate-Source Voltage (static)		± 20	V
V_{GS}	Gate-Source Voltage (dynamic)(AC ($f>1\text{Hz}$))		± 30	
I_D	Continuous Drain Current	($T_C=25^\circ\text{C}$)	14	A
		($T_C=100^\circ\text{C}$)	9	
$I_{D,pulse}$	Pulsed Drain Current ($T_C = 25^\circ\text{C}$)		25	
I_S	Continuous diode forward current	($T_C=25^\circ\text{C}$)	11	
$I_{S,pulse}$	Diode pulse current	($T_C=25^\circ\text{C}$)	25	
E_{AS}	Avalanche energy, single pulse($I_D=3.4\text{A}, V_{DD}=50\text{V}$)		300	mJ
I_{AS}	Avalanche current, single pulse		3.4	A
dv/dt	MOSFET dv/dt ruggedness ($V_{DS}=0\ldots 400\text{V}$)		50	V/ns
dv/dt	Recovery diode dv/dt ($V_{DS}=0\ldots 400\text{V}, I_{SD}\leq 7\text{A}$)		15	V/ns
P_{tot}	Power Dissipation	($T_C=25^\circ\text{C}$)	63	W
T_J, T_{STG}	Operating Junction Storage Temperature Range		-55 to +150	$^\circ\text{C}$

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 ($T_J=25^{\circ}\text{C}$ unless otherwise specified)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static Characteristics						
BVDSS	Drain-Source Breakdown Voltage	VGS = 0V, ID = 1mA	650	--	--	V
VGS(th)	Gate Threshold Voltage	VDS = VGS, ID = 250μA	3	3.5	4	V
IDSS	Zero Gate Voltage Drain Current	VDS = 650V, VGS = 0V, TJ = 25°C	--	--	1	μA
IGSS	Gate to Source Leakage Current	VDS = 0 V , VGS = ±30V	-100	2	100	nA
RDS(ON)	Drain-Source On-State Resistance	VGS = 10V, ID = 7A, T J = 25°C	--	250	290	mΩ
		VGS = 10V, ID =7A, T J = 150°C	--	630	--	
RG	Gate Resistance	f = 1.0MHz,open drain	--	8	--	Ω
Dynamic Characteristics						
Ciss	Input Capacitance	VGS = 0V, VDS = 50V, f = 100kHz	--	450	--	pF
Coss	Output Capacitance		--	60	--	
Crss	Reverse Transfer Capacitance		--	4.3	--	
td(on)	Turn-on Delay Time	VDS = 400 V, ID = 7A VGS = 15V, Rg = 10Ω	--	20	--	ns
tr	Turn-on Rise Time		--	13	--	
td(off)	Turn-off Delay Time		--	40	--	
tf	Turn-off Fall Time		--	15	--	
Qg	Total Gate Charge	ID = 7 A , VDD=400V VGS = 0~10V	--	22	--	nC
Qgs	Gate-Source Charge		--	5	--	
Qgd	Gate-Drain Charge		--	11	--	
Vplateau	Gate plateau voltage		--	6	--	V
Body Diode Characteristics						
VSD	Body Diode Forward Voltage	VR= 400V IF = 7 A, diF/dt = 100A/μs,	--	--	1.3	V
trr	Reverse Recovery Time		--	220	--	ns
Qrr	Reverse Recovery Charge		--	2.2	--	μC
Irm	Peak reverse recovery current		--	16	--	A

Typical Electrical and Thermal Characteristics ($T_J = 25^\circ\text{C}$, unless otherwise noted)

Fig 1: Typical Output characteristics (25°C)

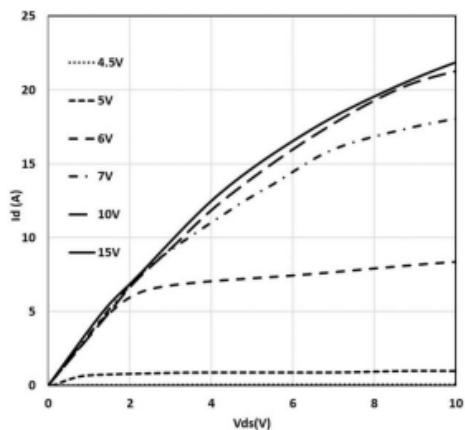


Fig 2: Transfer characteristics

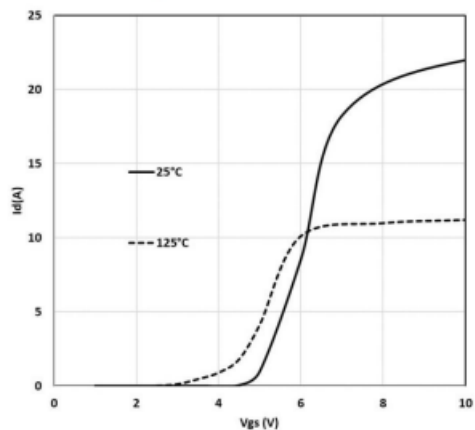


Fig 3: Safe Operating Area

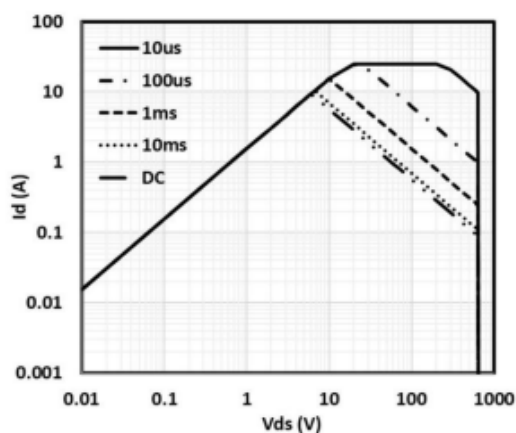


Fig 4: Power dissipation

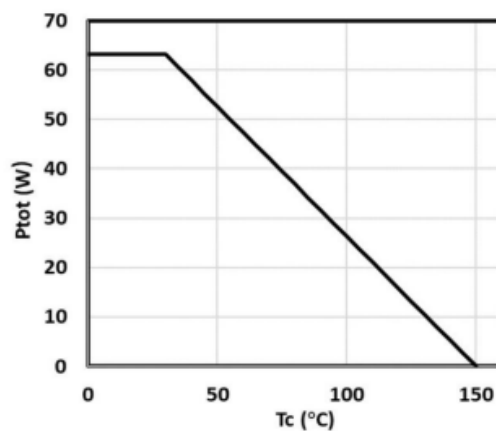


Fig 5: Gate charge

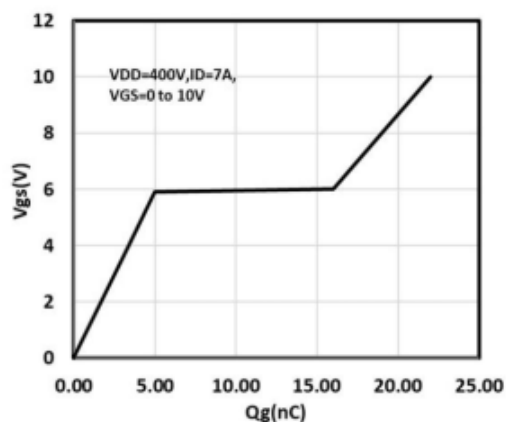


Fig 6: Typical capacitance characteristics

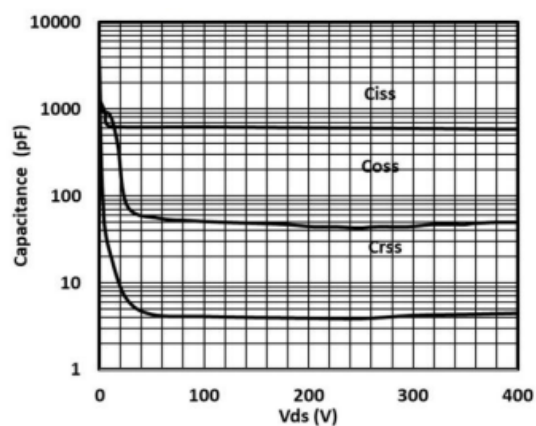


Fig 7: On Resistor vs.Junction temperature

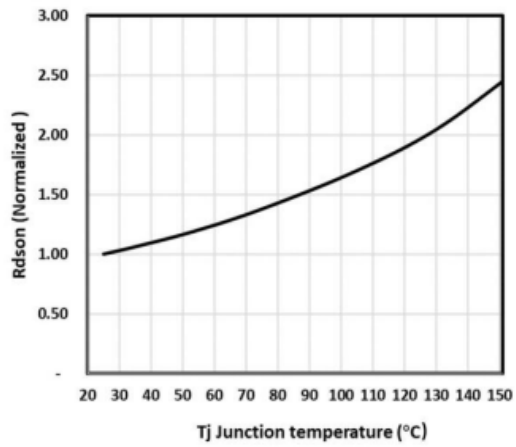
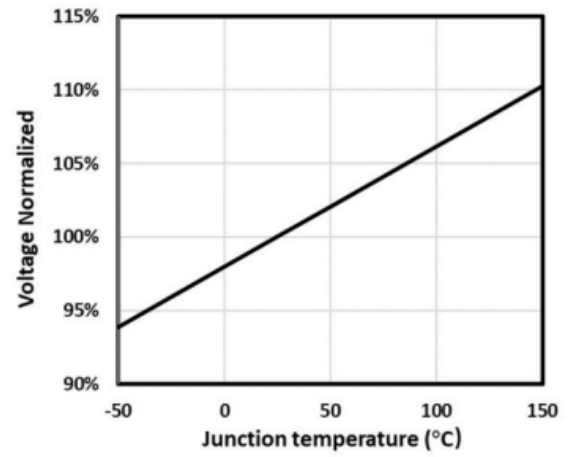


Fig 8: Drain-Source Breakdown Voltage



Test Circuit and Waveforms

Fig A: Switching Test Circuit & Waveforms

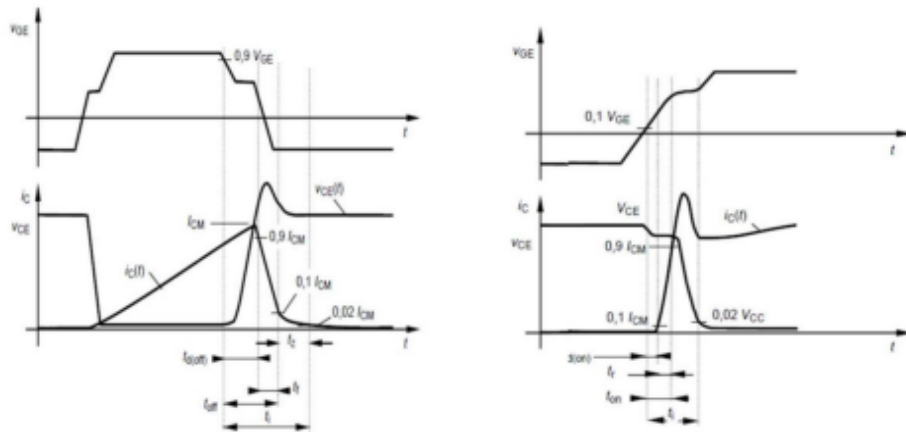


Fig B: Diode Recovery Test Circuit & Waveforms

