

Product Summary

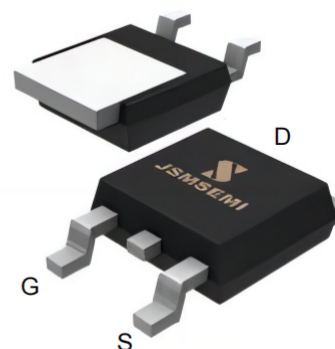
- V_{DS} -60V
- I_D -30A
- $R_{DS(ON)}$ (at $V_{GS}=10V$) <35m Ω
- 100% EAS Tested
- 100% ∇V_{DS} Tested

General Description

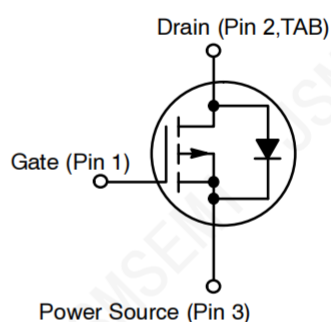
- Vertical Double-diffused MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low $R_{DS(ON)}$
- Moisture Sensitivity Level 1
- Epoxy Meets UL 94 V-0 Flammability Rating
- Halogen Free

Applications

- Power switching application
- Uninterruptible power supply
- DC-DC convertor
- Motor drivers



TO-252



Absolute Maximum Ratings: (T_C=25°C unless otherwise noted)

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	-60	V
V_{GS}	Gate-Source Voltage	±20	V
I_D	Continuous Drain Current	-30	A
	Continuous Drain Current-T _C =100°C	-19	
	Pulsed Drain Current ¹	-	
EAS	Single Pulse Avalanche Energy	225	mJ
P _D	Power Dissipation	50	W
T _J , T _{STG}	Operating and Storage Junction Temperature Range	-55 to +175	°C

Thermal Characteristics:

Symbol	Parameter	Max	Units
R _{θJC}	Thermal Resistance,Junction to Case	3	°C/W
R _{θJA}	Thermal Resistance,Junction to Ambient	42	

Electrical Characteristics: ($T_C=25^{\circ}\text{C}$ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250 μA	-60	---	---	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{GS} =0V, V _{DS} =-60V	---	---	-1	μA
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±20V, V _{DS} =0A	---	---	±100	nA
On Characteristics						
V _{GS(th)}	GATE-Source Threshold Voltage	V _{GS} =V _{DS} , I _D =250 μA	-1	-1.8	-2.5	V
R _{DS(ON)}	Drain-Source On Resistance②	V _{GS} =-10V, I _D =-15A	---	26	35	mΩ
		V _{GS} =-4.5V, I _D =-10A	---	32	40	
G _{FS}	Forward Transconductance	V _{DS} =-10V, I _D =-15A	---	---	---	S
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =-30V, V _{GS} =0V, f=1MHz	---	2535	---	pF
C _{oss}	Output Capacitance		---	130		
C _{rss}	Reverse Transfer Capacitance		---	75		
Switching Characteristics						
t _{d(on)}	Turn-On Delay Time	V _{DD} =-30V, I _D =-10A, R _{GEN} =6.8 Ω, V _{GS} =-10V	---	14	---	ns
t _r	Rise Time		---	18	---	ns
t _{d(off)}	Turn-Off Delay Time		---	42	---	ns
t _f	Fall Time		---	15	---	ns
Q _g	Total Gate Charge	V _{GS} =-10V, V _{DS} =-30V, I _D =-10A	---	46	---	nC
Q _{gs}	Gate-Source Charge		---	11	---	nC
Q _{gd}	Gate-Drain “Miller ” Charge		---	10	---	nC
Drain-Source Diode Characteristics						
V _{SD}	Source-Drain Diode Forward Voltage	V _{GS} =0V, I _S =-15A, T _J =25 °C	---	-0.88	-1.2	V
t _{rr}	Reverse Recovery Time	I _S =-20A, V _{GS} =0V. di/dt=-500A/μs	---	28	---	ns
Q _{rr}	Reverse Recovery Charge		---	165	---	nc

Notes:

1. Repetitive rating; pulse width limited by max. junction temperature.
2. Pulse width $\leq 300\mu s$; duty cycle $\leq 2\%$.
3. Limited by T_{Jmax} , starting $T_J = 25^{\circ}\text{C}$, $L = 0.5mH, R_G = 25\Omega, I_{AS} = -32A, V_{GS} = -10V$. Part not recommended for use above this value

Typical Characteristics: ($T_C=25^{\circ}\text{C}$ unless otherwise noted)

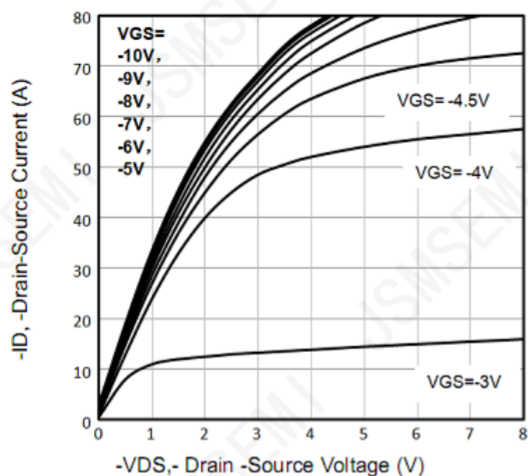


Fig1. Typical Output Characteristics

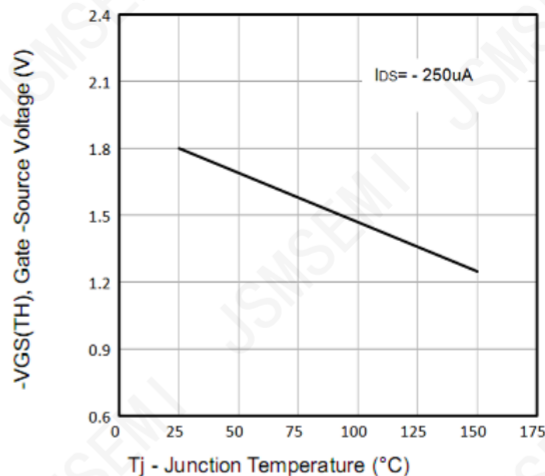


Fig2. -VGS(TH) Gate -Source Voltage Vs. T_j

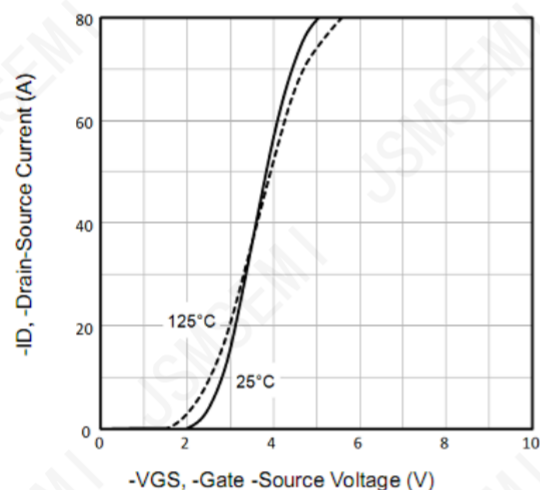


Fig3. Typical Transfer Characteristics

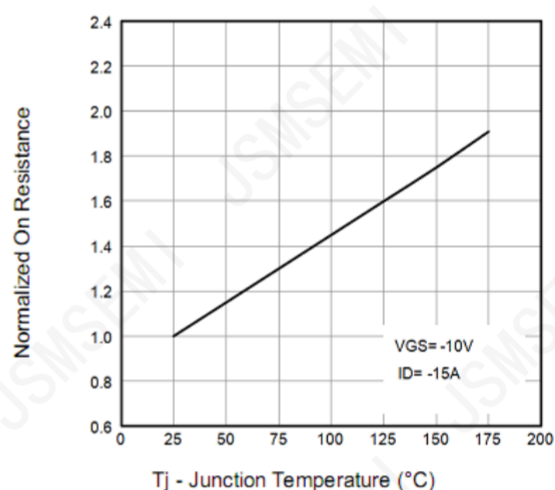


Fig4. Normalized On-Resistance Vs. T_j

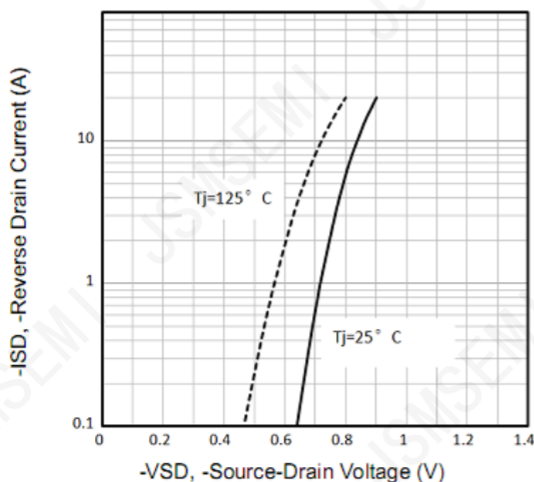


Fig5. Typical Source-Drain Diode Forward Voltage

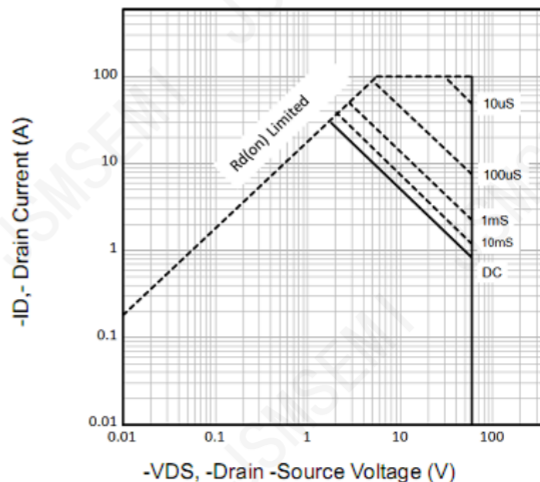
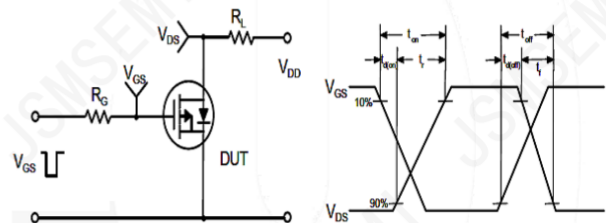
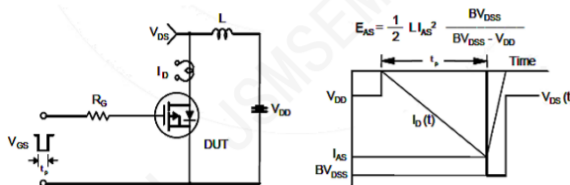
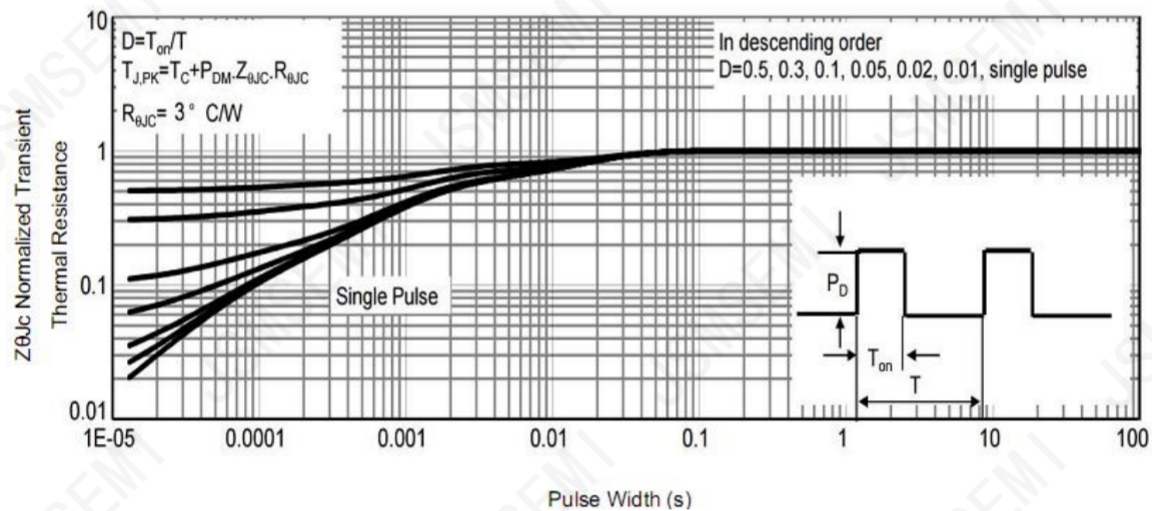
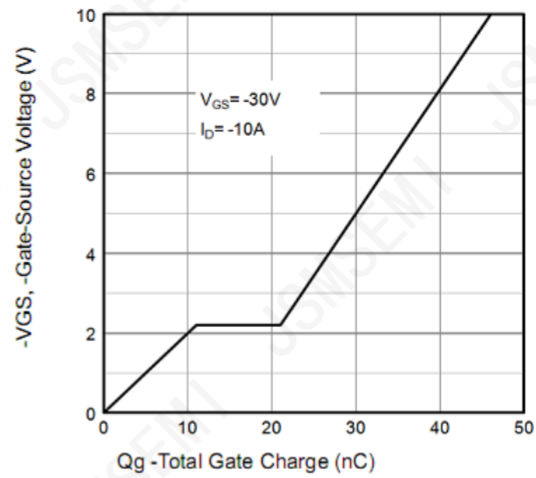
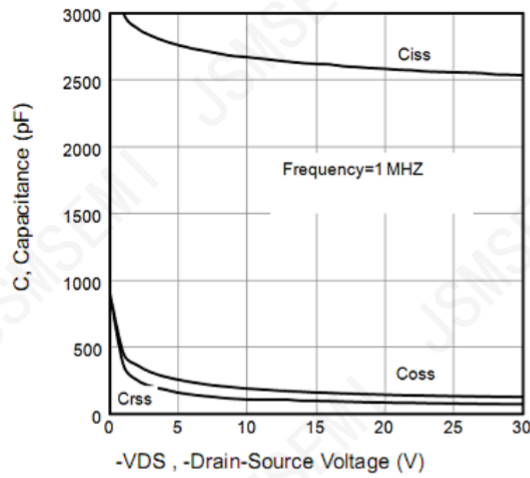
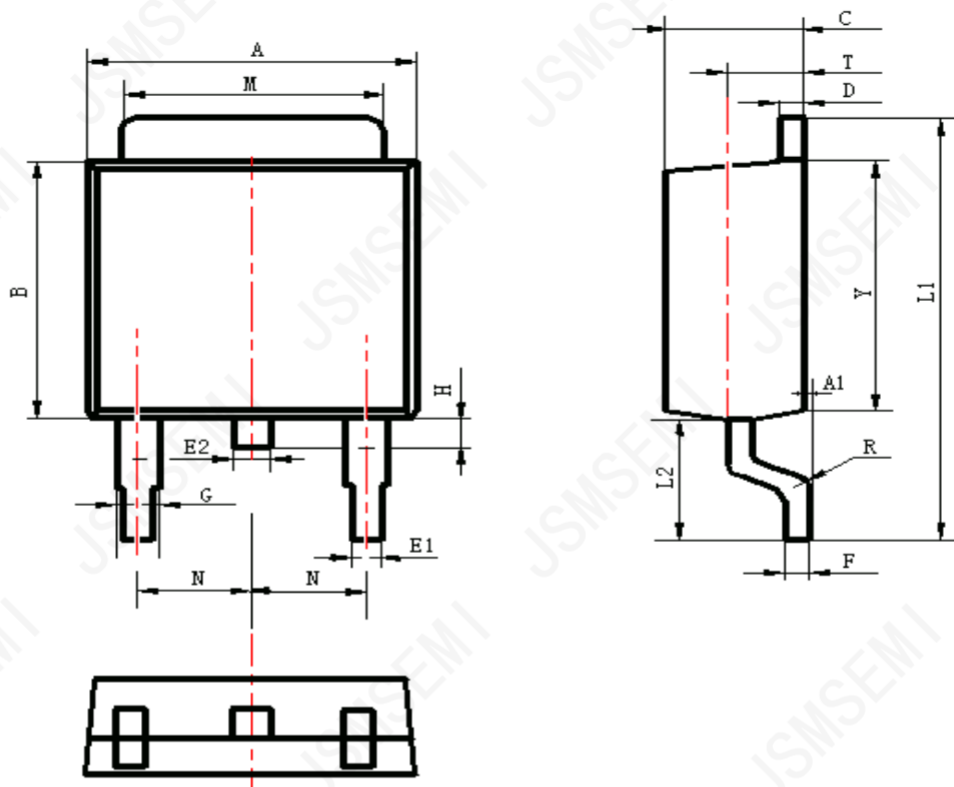


Fig6. Maximum Safe Operating Area



Package Information

TO-252



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	6.30	6.90	0.248	0.272
A1	0.00	0.16	0.000	0.006
B	5.70	6.30	0.224	0.248
C	2.10	2.50	0.083	0.098
D	0.30	0.70	0.012	0.028
E1	0.60	0.90	0.024	0.035
E2	0.70	1.00	0.028	0.039
F	0.30	0.60	0.012	0.024
G	0.70	1.20	0.028	0.047
L1	9.60	10.50	0.378	0.413
L2	2.70	3.10	0.106	0.122
H	0.40	1.00	0.016	0.039
M	5.10	5.50	0.201	0.217
N	2.09	2.49	0.082	0.098
R	0.30		0.012	
T	1.40	1.60	0.055	0.063
Y	5.10	6.30	0.201	0.248

Ordering Information

Order number	Package	Marking	Operation Temperature Range	MSL Grade	Ship, Quantity	Green
FR5305-S-JSM	TO-252	FR5305-S	-55 to 175°C	1	T&R,2500	RoHS

Revision History

Rev.	Change	Date
V1.0	Initial version	6/27/2021

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