

Product Summary

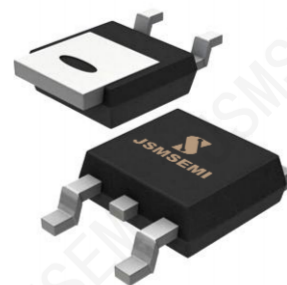
- V_{DS} -60V
- I_D 26A
- $R_{DS(ON)}$ (at $V_{GS}=10V$) <20m Ω
- 100% EAS Tested
- 100% ∇V_{DS} Tested

General Description

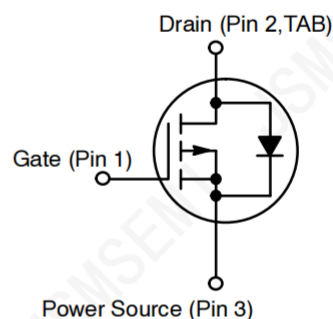
- Trench Power MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low $R_{DS(ON)}$
- Moisture Sensitivity Level 1
- Epoxy Meets UL 94 V-0 Flammability Rating
- Halogen Free

Applications

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



TO-252



ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ Unless otherwise noted)

Parameter		Symbol	Maximum	Units	
Drain-Source Voltage		V_{DS}	-60	V	
Gate-Source Voltage		V_{GS}	± 20	V	
Continuous Drain Current ^G	$T_C=25^{\circ}\text{C}$	I_D	-26	A	
	$T_C=100^{\circ}\text{C}$		-18		
Pulsed Drain Current ^C		I_{DM}	-60		
Avalanche Current ^C		I_{AR}	-26	A	
Repetitive avalanche energy $L=0.1\text{mH}$ ^C		E_{AR}	33.8	mJ	
Power Dissipation ^B	$T_C=25^{\circ}\text{C}$	P_D	60	W	
	$T_C=100^{\circ}\text{C}$		30		
Power Dissipation ^A	$T_A=25^{\circ}\text{C}$	P_{DSM}	2.5	W	
	$T_A=70^{\circ}\text{C}$		1.6		
Junction and Storage Temperature Range		T_J, T_{STG}	-55 to 175	$^{\circ}\text{C}$	
Thermal Characteristics					
Parameter		Symbol	Typ	Max	Units
Maximum Junction-to-Ambient ^A	$t \leq 10\text{s}$	$R_{\theta JA}$	16.7	25	$^{\circ}\text{C/W}$
Maximum Junction-to-Ambient ^A	Steady-State		40	50	$^{\circ}\text{C/W}$
Maximum Junction-to-Case ^C	Steady-State	$R_{\theta JC}$	1.9	2.5	$^{\circ}\text{C/W}$

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress rating only and functional device operation is not implied

ELECTRICAL CHARACTERISTICS ($T_A=25^{\circ}\text{C}$ Unless otherwise noted)

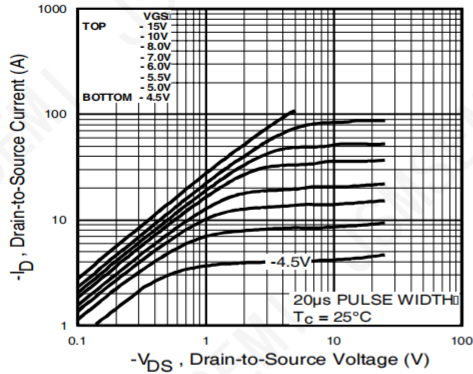
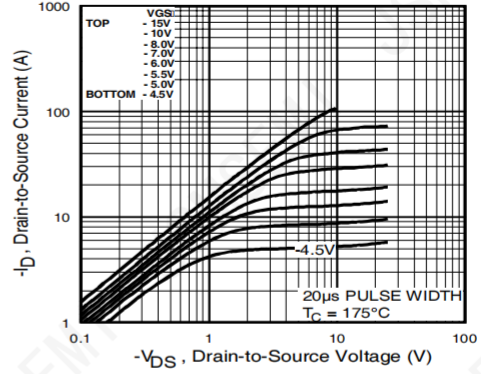
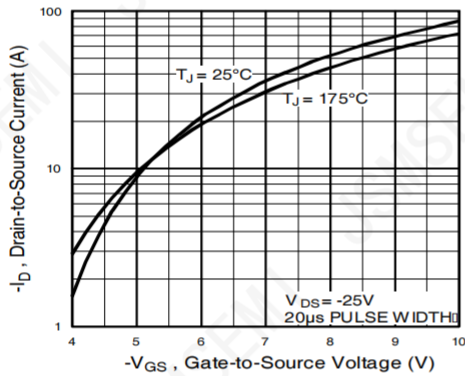
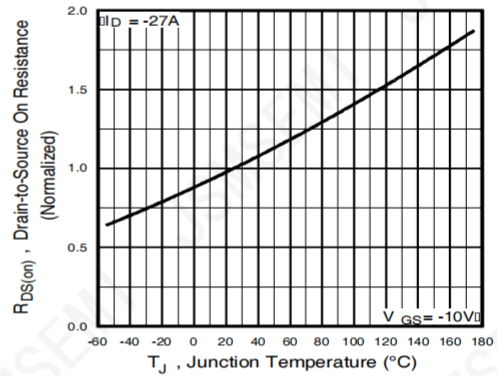
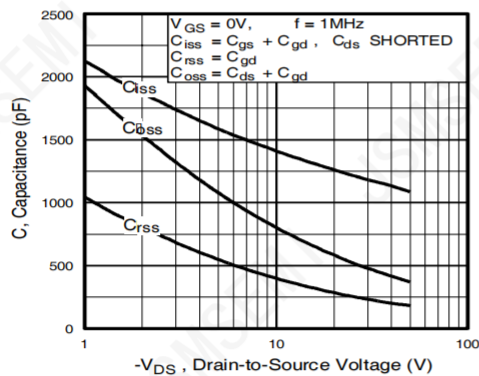
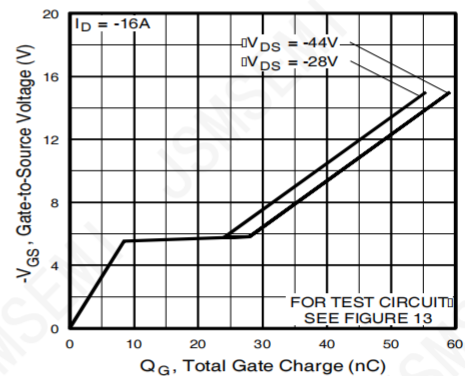
Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Parameters						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D= -250\mu A$	-60			V
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D= -250\mu A$	-1.0		-2.5	V
I_{GSS}	Gate Leakage Current	$V_{DS}=0V, V_{GS}=\pm 20V$			± 100	nA
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=-60V, V_{GS}=0$			-1	uA
		$V_{DS}=-60V, V_{GS}=0$ $T_J=85^{\circ}C$			-5	
$R_{DS(ON)}$	Drain-Source On-Resistance	$V_{GS}=-10V, I_D= -20 A$		16	20	mΩ
		$V_{GS}= -4.5V, I_D= -20 A$		20	23	
Source-Drain Diode						
V_{SD}	Diode Forward Voltage	$I_S= -1 A, V_{GS}=0V$		0.7	1.3	V
Dynamic Parameters						
Q_g	Total Gate Charge	$V_{DS}= -30V$ $V_{GS}= -10V$ $I_D=-20 A$		53		nC
Q_{gs}	Gate-Source Charge			12		
Q_{gd}	Gate-Drain Charge			13		
C_{iss}	Input Capacitance	$V_{DS}= -30V$ $V_{GS}=0V$ $f=1MHz$		1886		pF
C_{oss}	Output Capacitance			540		
C_{rss}	Reverse Transfer Capacitance			240		
$T_{d(on)}$	Turn-On Time	$V_{DS}= -30V$ $R_L=1.50\Omega$ $V_{GEN}=-10V$ $R_G=3.0\Omega$		114		nS
T_r				90		
$T_{d(off)}$	Turn-Off Time			312		
T_f				102		

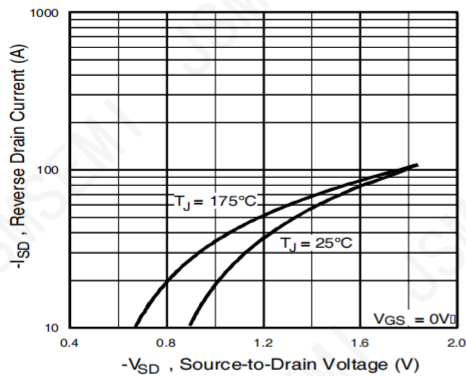
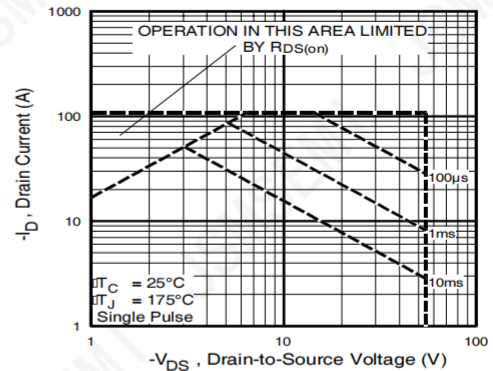
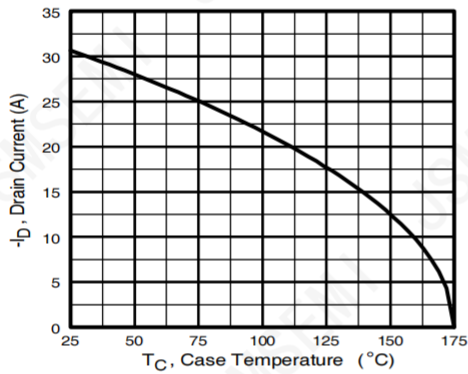
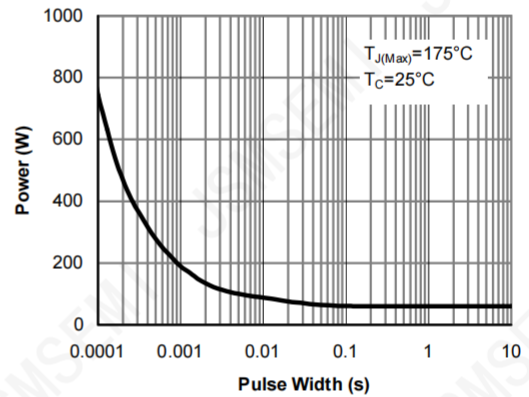
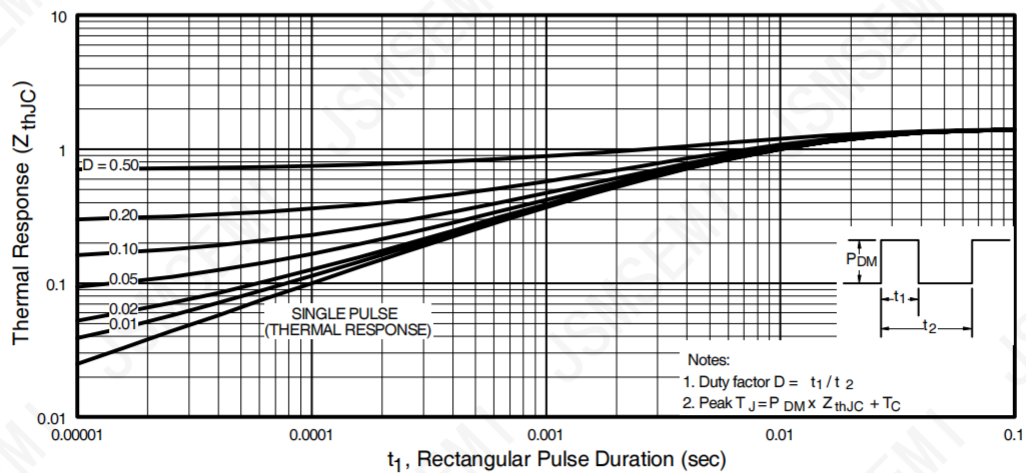
 Note: 1. Pulse test: pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$

2. Static parameters are based on package level with recommended wire bonding

Ordering Information

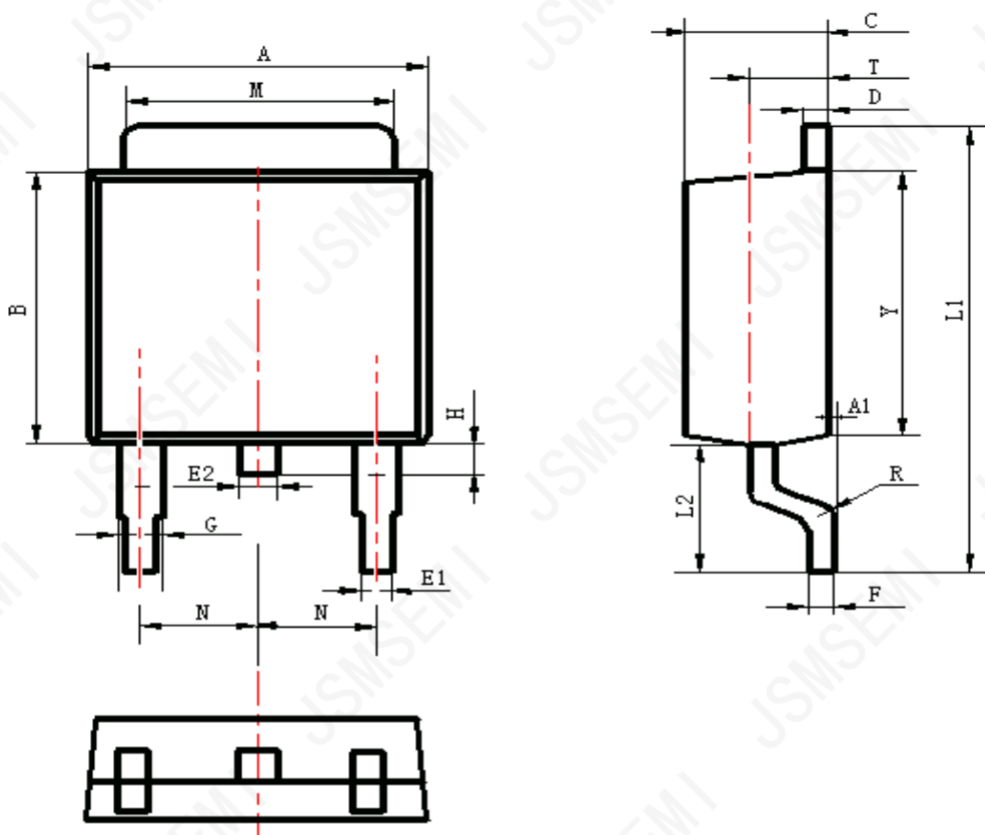
Order number	Package	Marking	Operation Temperature Range	MSL Grade	Ship, Quantity	Green
SIRF5305TRPBF	TO-252	FR5305	-55 to 175 $^{\circ}\text{C}$	1	T&R, 2500	Rohs

TYPICAL CHARACTERISTICS (25°C Unless Note)

Fig 1. Typical Output Characteristics

Fig 2. Typical Output Characteristics

Fig 3. Typical Transfer Characteristics

Fig 4. Normalized On-Resistance Vs. Temperature

Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage

TYPICAL CHARACTERISTICS (continuous)

Fig 7. Typical Source-Drain Diode Forward Voltage

Fig 8. Maximum Safe Operating Area

Fig 9. Maximum Drain Current Vs. Case Temperature

Figure 10: Single Pulse Power Rating Junction-to-Case (Note F)


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

Revision History

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

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