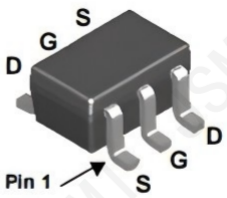
Product Summary

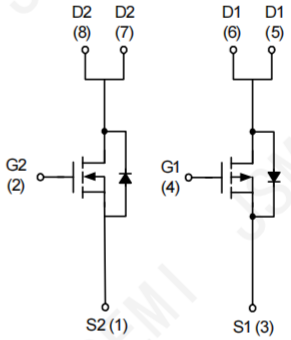
- V_{DS} 20V/-20V
- I_D 0.7A/-0.6A
- $R_{DS(ON)}$(at V_{GS}=4.5V) ＜300mΩ/420mΩ
- 100%EASTested
- 100%∇V_{DS} Tested



SOT363

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



N+P-Channel MOSFET

Applications

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

Absolute Maximum RatingsTA=25℃ unless otherwise noted

Symbol	Parameter	Q1	Q2	Units
VDSS	Drain-SourceVoltage	20	−20	V
VGSS	Gate-SourceVoltage	±12	±12	V
ID	DrainCurrent– Continuous(Note1)	0.7	−0.6	A
	–Pulsed	2.1	−2	
PD	Power Dissipation for Single Operation(Note1)	0.3		W
TJ,TSTG	Operating and Storage Junction Temperature Range	−55 to+150		°C

Thermal Characteristics

$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient Note 1)	415	°C/W

Ordering Information

Order number	Package	Operation Temperature Range	MSL Grade	Ship,Quantity	Green
SI1555DL-T1-GE3-JSM	SOT-363	−55 to+150℃	1	T&R,3000	Rohs

Electrical Characteristics TA=25°C unless otherwise noted

Symbol	Parameter		Test Conditions		Min	Typ	Max	Units
Off Characteristics								
BV_{DSS}	Drain–Source Breakdown Voltage		V_{GS} = 0 V, I_D = 250 μA V_{GS} = 0 V, I_D = –250 μA	Q1 Q2	20 –20			V
$\frac{\Delta BV_{DSS}}{\Delta T_J}$	Breakdown Voltage Temperature Coefficient		I_D = 250 μA,Ref. to 25°C I_D = –250 μA,Ref. to 25°C	Q1 Q2		14 –14		mV/°C
I_{DSS}	Zero Gate Voltage Drain Current		V_{DS} = 16 V, V_{GS} = 0 V V_{DS} =–16 V, V_{GS} = 0 V	Q1 Q2			1 –1	μA
I_{GSSF} /I_{GSSR}	Gate–Body Leakage, Forward		V_{GS} = ± 12 V, V_{DS} = 0 V				±100	nA
I_{GSSF} /I_{GSSR}	Gate–Body Leakage, Reverse		V_{GS} = ± 12V , V_{DS} = 0 V				±100	nA
On Characteristics (Note 2)								
$V_{GS(th)}$	Gate Threshold Voltage	Q1	V_{DS} = V_{GS}, I_D = 250 μA		0.6	1.1	1.5	V
		Q2	V_{DS} = V_{GS}, I_D = –250 μA		-0.6	–1.2	–1.5	
$\frac{\Delta V_{GS(th)}}{\Delta T_J}$	Gate Threshold Voltage Temperature Coefficient	Q1 Q2	I_D = 250 μA,Ref. To 25°C I_D = –250 μA, Ref. to 25°C			–2.8 3		mV/°C
$R_{DS(on)}$	Static Drain–Source On–Resistance	Q1	V_{GS} = 4.5 V, I_D =0.7 A V_{GS} = 2.5 V, I_D =0.6 A V_{GS} = 4.5 V, I_D =0.7A,T_J=125°C			180 293 247	300 400 442	mΩ
		Q2	V_{GS} = –4.5 V, I_D = –0.6 A V_{GS} = –2.5 V, I_D = –0.5 A V_{GS}=–4.5 V, I_D =–0.6 A,T_J=125°C			300 470 400	420 630 700	
g_{FS}	Forward Transconductance	Q1	V_{DS} = 5 V I_D = 0.7 A			2.8		S
		Q2	V_{DS} = –5 V I_D = –0.6A			1.8		
$I_{D(on)}$	On–State Drain Current	Q1	V_{GS} = 4.5 V, V_{DS} = 5 V		1			A
		Q2	V_{GS} = –4.5 V, V_{DS} = –5 V		–2			
Dynamic Characteristics								
C_{iss}	Input Capacitance	Q1	V_{DS}=10 V, V_{GS}= 0 V, f=1.0MHz			113		pF
		Q2	V_{DS}=–10 V, V_{GS}= 0 V, f=1.0MHz			114		
C_{oss}	Output Capacitance	Q1	V_{DS}=10 V, V_{GS}= 0 V, f=1.0MHz			34		pF
		Q2	V_{DS}=–10 V, V_{GS}= 0 V, f=1.0MHz			24		
C_{rss}	Reverse Transfer Capacitance	Q1	V_{DS}=10 V, V_{GS}= 0 V, f=1.0MHz			16		pF
		Q2	V_{DS}=–10 V, V_{GS}= 0 V, f=1.0MHz			9		
Switching Characteristics (Note 2)								
$t_{d(on)}$	Turn–On Delay Time	Q1	For **Q1**: V_{DS} =10 V, I_D= 1 A V_{GS}= 4.5 V, R_{GEN} = 6 Ω For **Q2**: V_{DS} =–10 V, I_D= –1 A V_{GS}= –4.5 V, R_{GEN} = 6 Ω			5	10	ns
		Q2				5.5	11	
t_r	Turn–On Rise Time	Q1				7	15	ns
		Q2				14	25	
$t_{d(off)}$	Turn–Off Delay Time	Q1				9	18	ns
		Q2				6	12	
t_f	Turn–Off Fall Time	Q1				1.5	3	ns
		Q2				1.7	3.4	
Q_g	Total Gate Charge	Q1	For **Q1**: V_{DS} =10 V, I_D= 0.7 A V_{GS}= 4.5 V, R_{GEN} = 6 Ω For **Q2**: V_{DS} =–10 V, I_D= –0.6 A V_{GS}= –4.5 V,R_{GEN} = 6 Ω			1.1	1.5	nC
		Q2				1.4	2	
Q_{gs}	Gate–Source Charge	Q1				0.24		nC
		Q2				0.3		
Q_{gd}	Gate–Drain Charge	Q1				0.3		nC
		Q2				0.4		
Drain–Source Diode Characteristics and Maximum Ratings								
I_S	Maximum Continuous Drain–Source Diode Forward Current			Q1			0.25	A
				Q2			–0.25	
V_{SD}	Drain–Source Diode Forward Voltage	Q1	V_{GS} = 0 V, I_S = 0.25 A (Note 2)			0.74	1.2	V
		Q2	V_{GS} = 0 V, I_S = –0.25 A (Note 2)			–0.77	–1.2	

Notes: 1.$R_{\theta JA}$is the sum of the junction-to-case and case-to-ambient thermal resistance where the case thermal reference is defined as the solder mounting surface of the drain pins. RJCis guaranteed by design while RJA is determined by the user's board design. RJA = 415°C/W when mounted on a minimum pad of FR-4 PCB in a still air environment.
2.Pulse Test: Pulse Width < 300s, Duty Cycle < 2.0%

Typical Characteristics: N-Channel

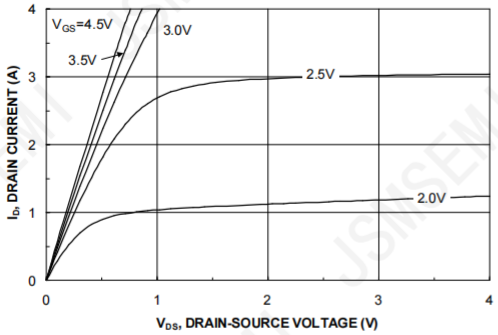


Figure 1. On-Region Characteristics.

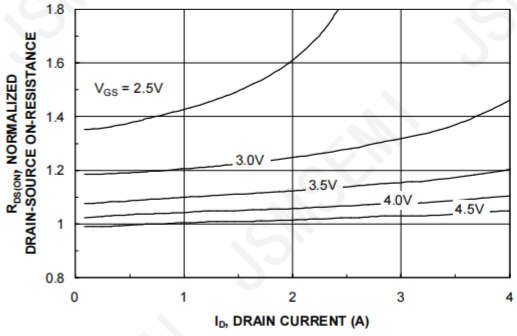


Figure 2. On-Resistance Variation with Drain Current and Gate Voltage.

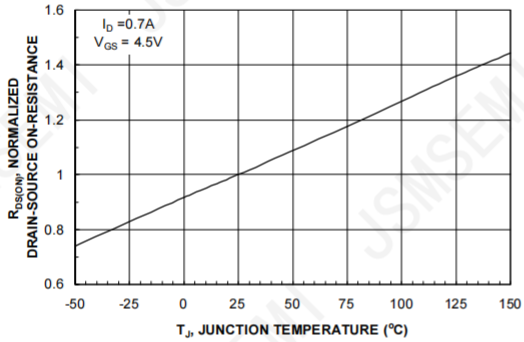


Figure 3. On-Resistance Variation with Temperature.

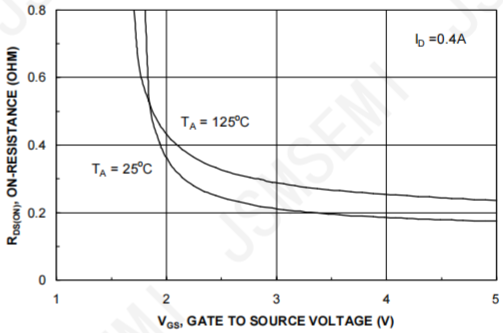


Figure 4. On-Resistance Variation with Gate-to-Source Voltage.

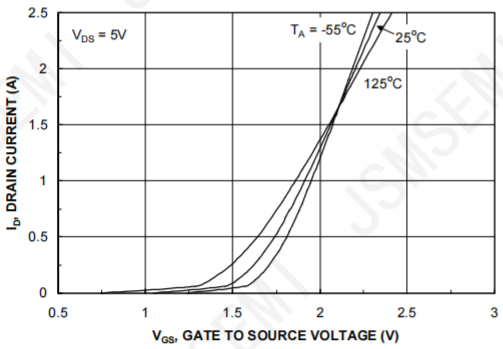


Figure 5. Transfer Characteristics.

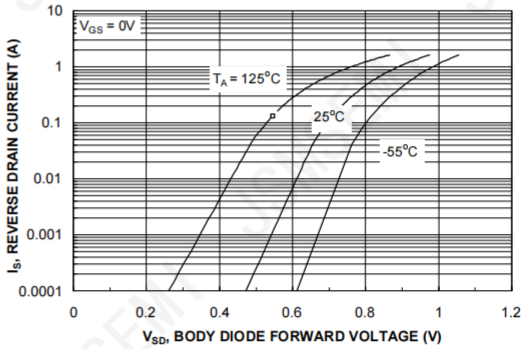


Figure 6. Body Diode Forward Voltage Variation with Source Current and Temperature.

Typical Characteristics: N-Channel

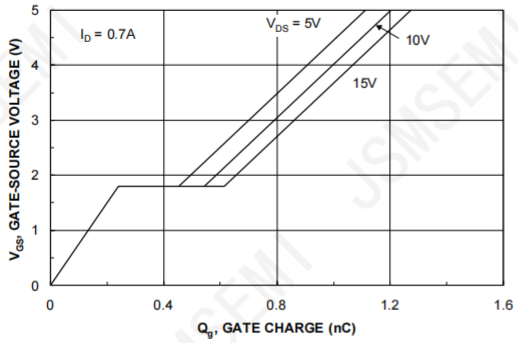


Figure 7. Gate Charge Characteristics.

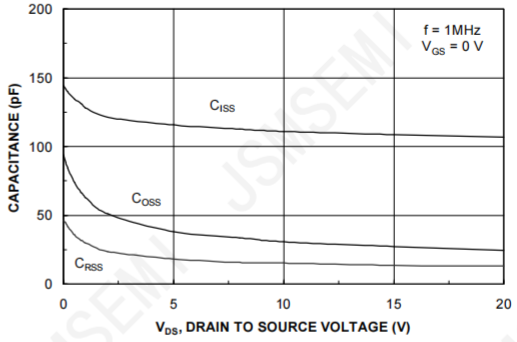


Figure 8. Capacitance Characteristics.

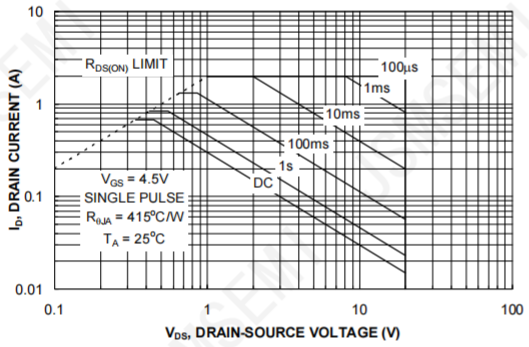


Figure 9. Maximum Safe Operating Area.

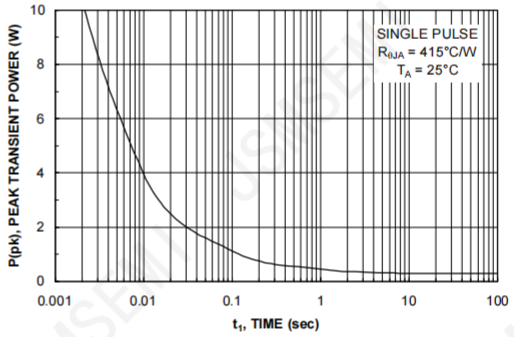


Figure 10. Single Pulse Maximum Power Dissipation.

Typical Characteristics: P-Channel

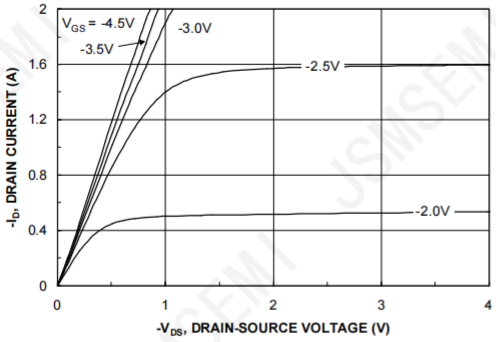


Figure 11. On-Region Characteristics.

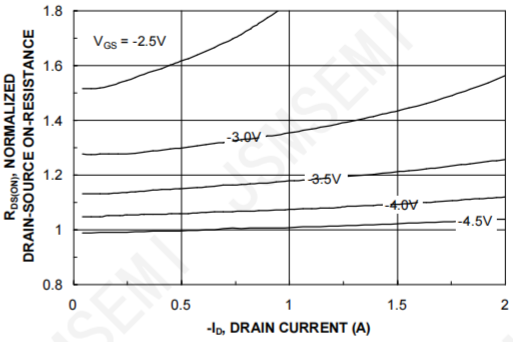


Figure 12. On-Resistance Variation with Drain Current and Gate Voltage.

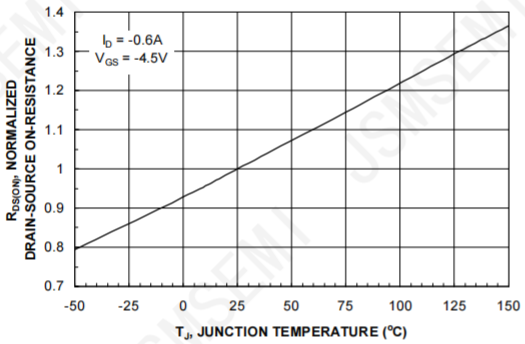


Figure 13. On-Resistance Variation with Temperature.

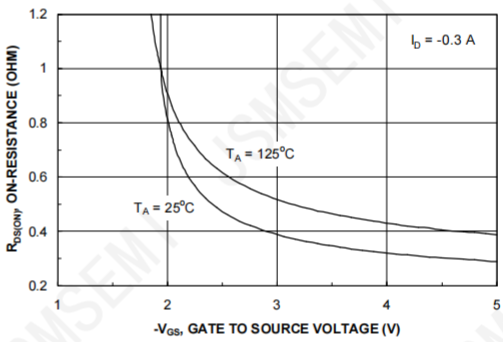


Figure 14. On-Resistance Variation with Gate-to-Source Voltage.

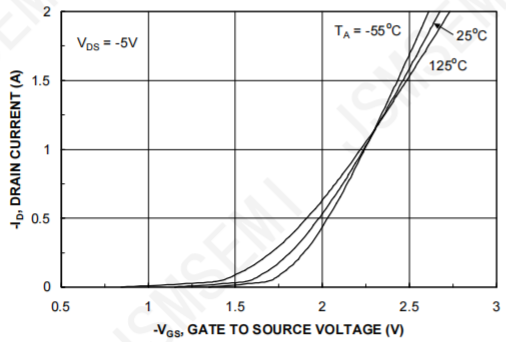


Figure 15. Transfer Characteristics.

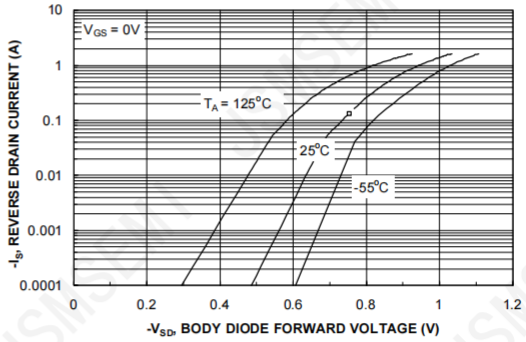


Figure 16. Body Diode Forward Voltage Variation with Source Current and Temperature.

Typical Characteristics: P-Channel

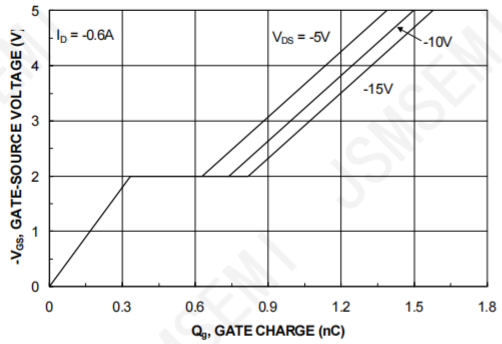


Figure 17. Gate Charge Characteristics.

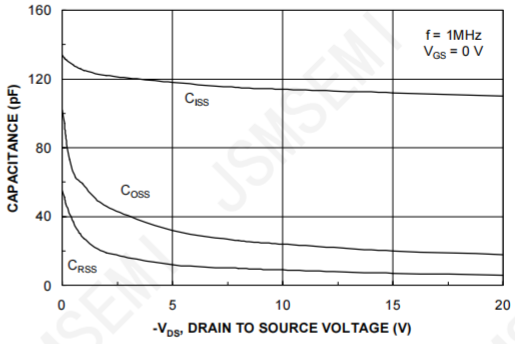


Figure 18. Capacitance Characteristics.

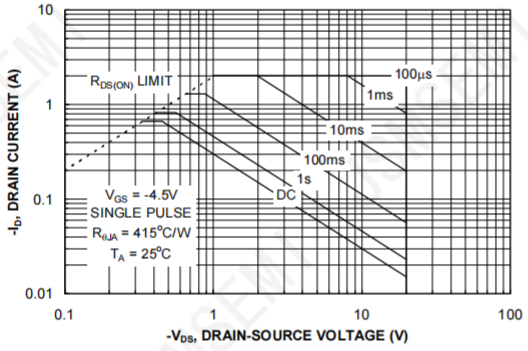


Figure 19. Maximum Safe Operating Area.

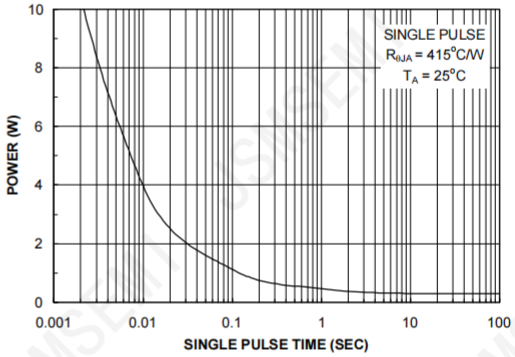


Figure 20. Single Pulse Maximum Power Dissipation.

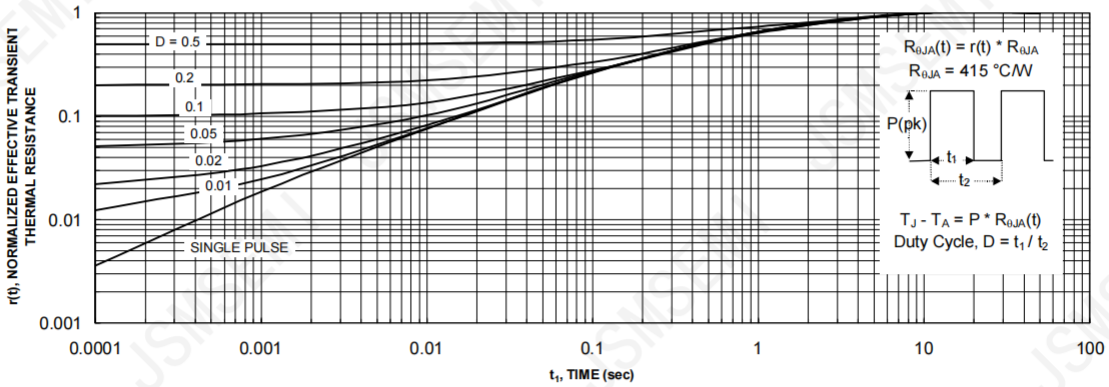


Figure 21. Transient Thermal Response Curve.

Thermal characterization performed using the conditions described in Note 1.
Transient thermal response will change depending on the circuit board design.

Revision History

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

Important Notice

JSMSEMI Semiconductor (JSMSEMI) PRODUCTS ARE NEITHER DESIGNED NOR INTENDED FOR USE IN MILITARY AND/OR AEROSPACE, AUTOMOTIVE OR MEDICAL DEVICES OR SYSTEMS UNLESS THE SPECIFIC JSMSEMI PRODUCTS ARE SPECIFICALLY DESIGNATED BY JSMSEMI FOR SUCH USE. BUYERS ACKNOWLEDGE AND AGREE THAT ANY SUCH USE OF JSMSEMI PRODUCTS WHICH JSMSEMI HAS NOT DESIGNATED FOR USE IN MILITARY AND/OR AEROSPACE, AUTOMOTIVE OR MEDICAL DEVICES OR SYSTEMS IS SOLELY AT THE BUYER’S RISK.

JSMSEMI assumes no liability for application assistance or customer product design. Customers are responsible for their products and applications using JSMSEMI products.

Resale of JSMSEMI products or services with statements diferent from or beyond the parameters stated by JSMSEMI for that product or service voids all express and any implied warranties for the associated JSMSEMI product or s ervice. JSMSEMI is not responsible or liable for any such statements.

Any and all information described or contained herein are subject to change without notice due to product/technology improvement, etc.When designing equipment, refer to the "Delivery Specification" for the JSMSEMI product that you intend to use.

For additional information please contact Kevin@jsmsemi.com or visit www.jsmsemi.com