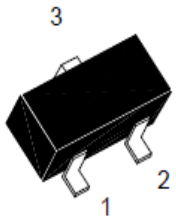
P-Channel Enhancement-Mode MOSFET (-20V, -4. 5A)

PRODUCT SUMMARY		
V_{DSS}	I_D	$R_{DS(on)}$ (m-ohm) Max
-20V	-4.5A	53 @ V_{GS} = -10V,I_D=-4.5A
		60 @ V_{GS} = -4.5V,I_D=-4.2A
		100 @ V_{GS} = -2.5V,I_D=-2.0A

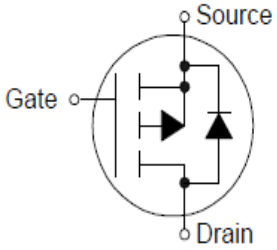
◆ Features

1、 Super high dense cell trench design for low RDS(on).
2、 Rugged and reliable.
3、 SOT-23 package
4、 RoHS Compliant.



SM2305 Pin Assignment & Symbol

3-Lead Plastic **SOT-23**
Pin 1: Gate 2: Source 3: Drain



◆ Ordering Information

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
SM2305SRL	SM2305SRG	SOT-23	G	S	D	Tape Reel
SM2305LRL	SM2305LRG	SOT-23-3L	G	S	D	Tape Reel

SM2305X X X

(1)Package Type
(2)Packing Type
(3)Lead Free

(1) S：SOT-23；L：SOT-23-3L

(2) R：Tape Reel

(3) G：Halogen Free；L：Lead Free

◆ Absolute Maximum Ratings (T_A=25°C, unless otherwise noted)

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	-20	V
V_{GS}	Gate-Source Voltage	±12	V
P_D	Maximum Power Dissipation @TA=25℃	1.1	W
	Maximum Power Dissipation t @TA=70℃	0.7	
I_{DM}	Drain Current (Pulsed) [*1]	-20	A
I_D	Continuous Drain Current @TA=25℃	-4.5	A
T_j, T_{stg}	Operating Junction and Storage Temperature Range	-55 to +150	°C
R_{qJA}	Thermal Resistance Junction to Ambient	110	°C/W

a: Surface Mounted on FR4 Board , t ≤ 5sec .

b: 1 Pulse Test: Pulse width ≤ 300us , Duty Cycle ≤ 2% .

◆ Electrical Characteristics (T_A=25°C, unless otherwise noted)

Symbol	Characteristic	Test Conditions	Min.	Typ.	Max.	Unit
• Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=-250uA	-20	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=-20V, V_{GS}=0V	-	-	-1	uA
		V_{DS}=-16V, V_{GS}=0V, T_J=55°C	-	-	-10	
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±12V, V_{DS}=0V	-	-	±100	nA
• On Characteristics[c]						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=-250uA	-0.6	-0.85	-1.4	V
$R_{DS(on)}$	Drain-Source On-State Resistance	V_{GS}=-10V, I_D=-4.5A	-	-	53	mΩ
		V_{GS}=-4.5V, I_D=-4.2A	-	-	60	
		V_{GS}=-2.5V, I_D=-2.0A	-	-	100	
gfs	Forward Transconductance	V_{DS}=-5V, I_D=-4.7A	-	14	-	S
• Dynamic Characteristics [d]						
C_{iss}	Input Capacitance	V_{DS}=-20V, V_{GS}=0V, f=1MHz	-	920	-	pF
C_{oss}	Output Capacitance		-	90	-	
C_{rss}	Reverse Transfer Capacitance		-	85	-	
R_g	Gate Resistance	V_{DS}=0V, V_{GS}=0V, f=1MHz	-	4.5	-	Ω
• Switching Characteristics[d]						
Q_g	Total Gate Charge	V_{DS}=-10V, I_D=-4.7A, V_{GS}=-4.5V	-	24	31.2	nC
Q_{gs}	Gate-Source Charge		-	18	23.4	
Q_{gd}	Gate-Drain Charge		-	2.7	3.51	
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=-10V, R_D=10Ω, I_D=-1A, V_{GS}=-4.5V, R_G=6Ω	-	22	44	nS
t_r	Turn-on Rise Time		-	35	70	
$t_{d(off)}$	Turn-off Delay Time		-	45	90	
t_f	Turn-off Fall Time		-	25	50	
t_{rr}	Reverse Recovery Time	I_{DS}=-4A, dI/ dt=100A/ uS	-	27	-	nS
Q_{rr}	Reverse Recovery Charge		-	14	-	nC
• Drain-Source Diode Characteristics						
V_{SD}	Drain-Source Diode Forward Voltage	V_{GS}=0V, I_S=-1.7A	-	-	-1.2	V

b:Pulse Test: Pulse Width £300us, Duty Cycle£2%

c: Guaranteed by design , not subject to production testing.

◆ Characteristics Curve

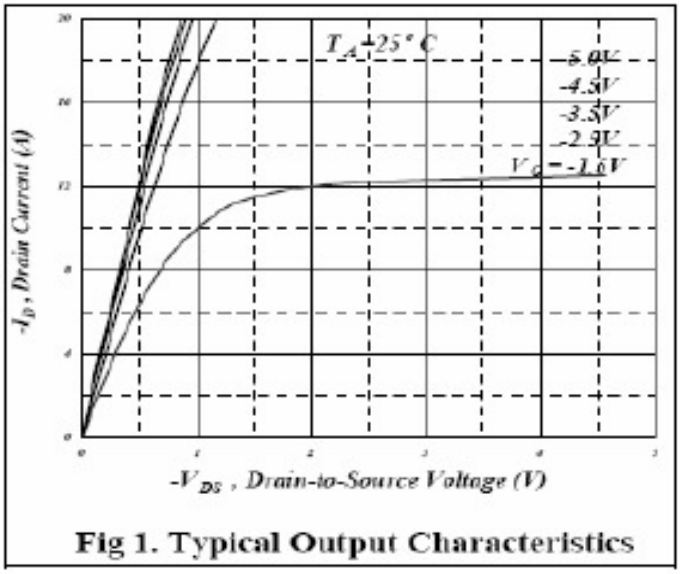


Fig 1. Typical Output Characteristics

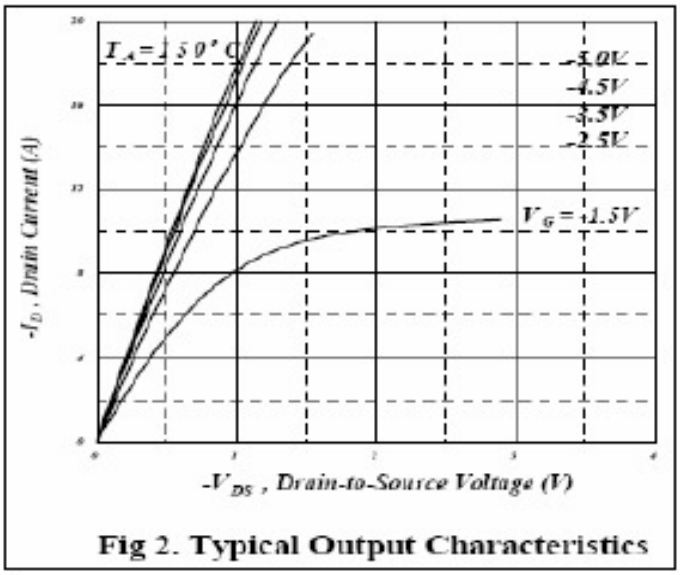


Fig 2. Typical Output Characteristics

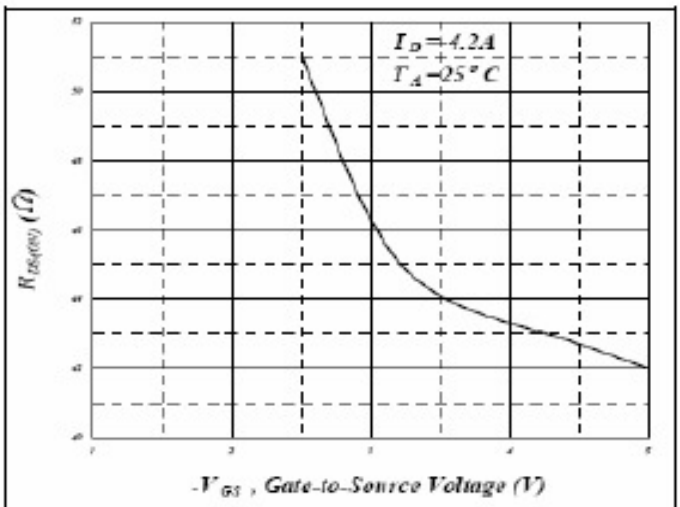


Fig 3. On-Resistance v.s. Gate Voltage

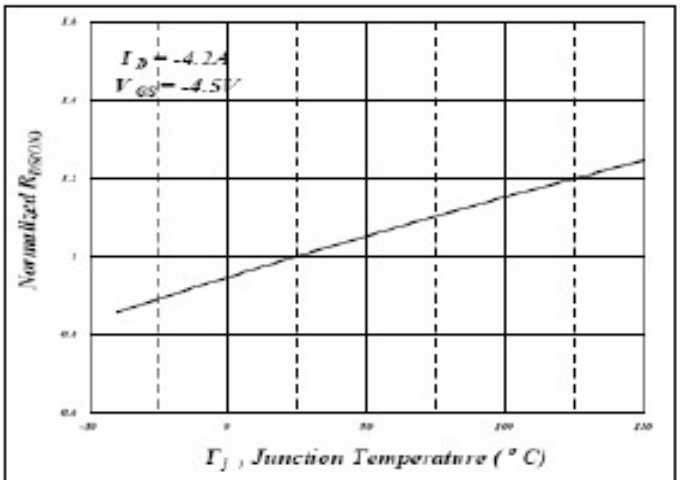


Fig 4. Normalized On-Resistance v.s. Junction Temperature

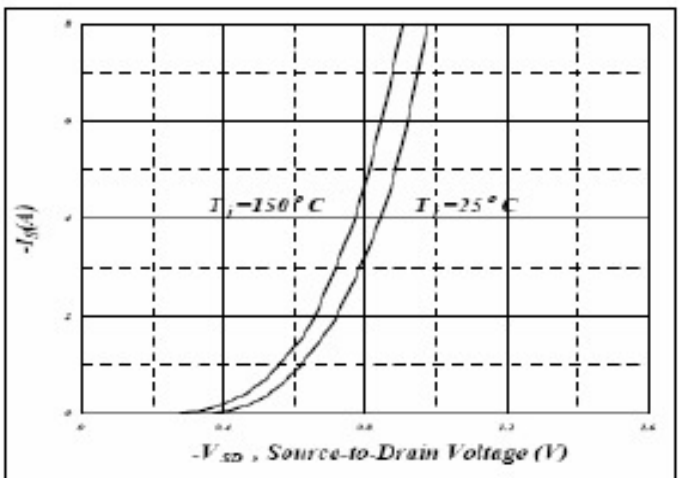


Fig 5. Forward Characteristic of Reverse Diode

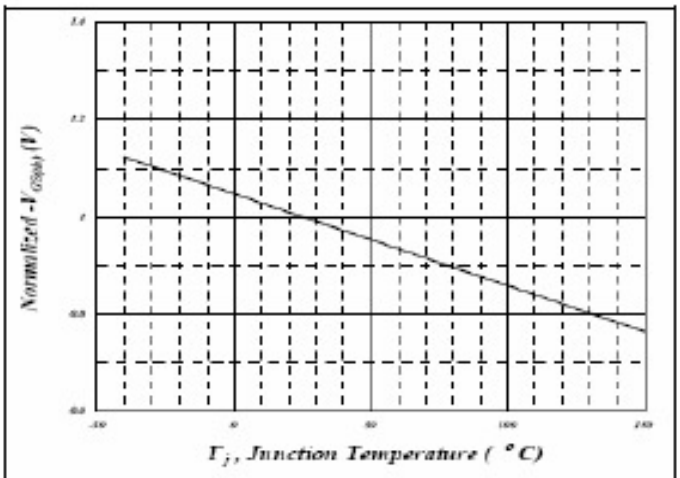


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

◆ Characteristics Curve

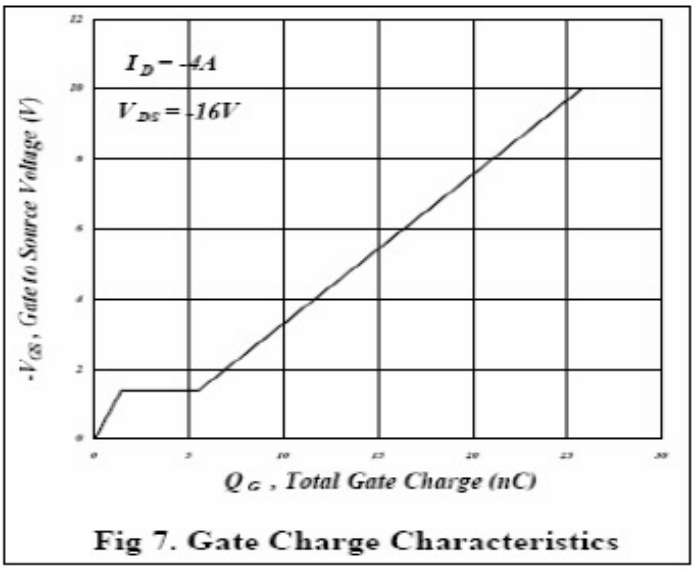


Fig 7. Gate Charge Characteristics

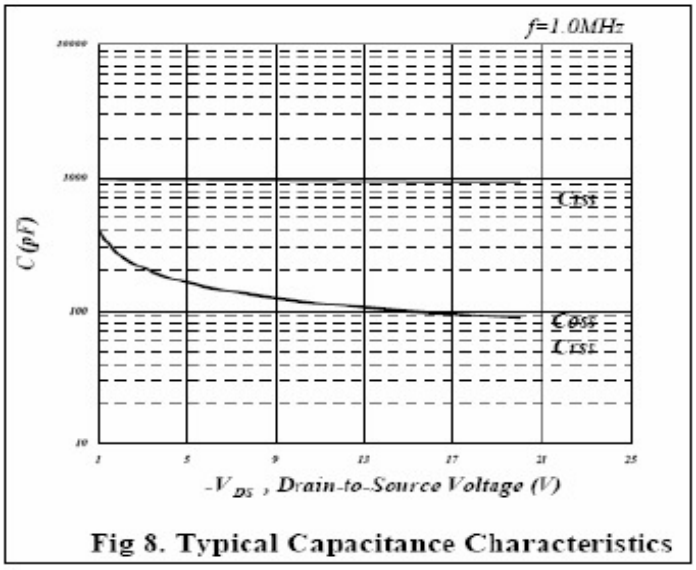


Fig 8. Typical Capacitance Characteristics

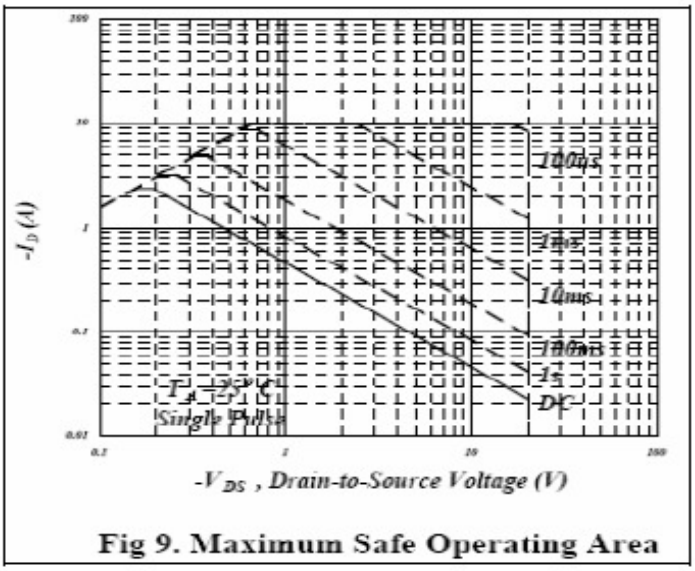


Fig 9. Maximum Safe Operating Area

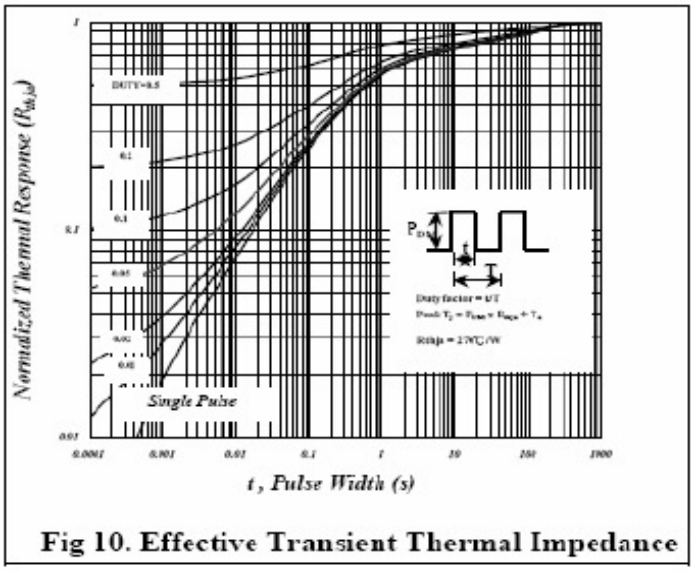


Fig 10. Effective Transient Thermal Impedance

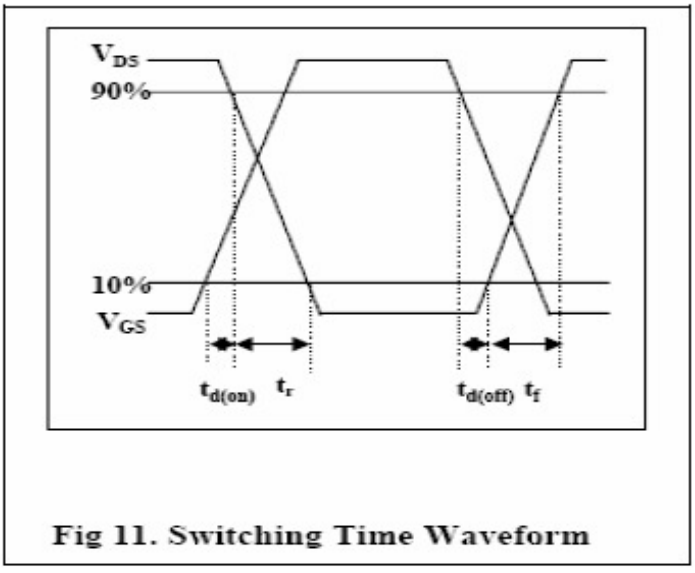


Fig 11. Switching Time Waveform

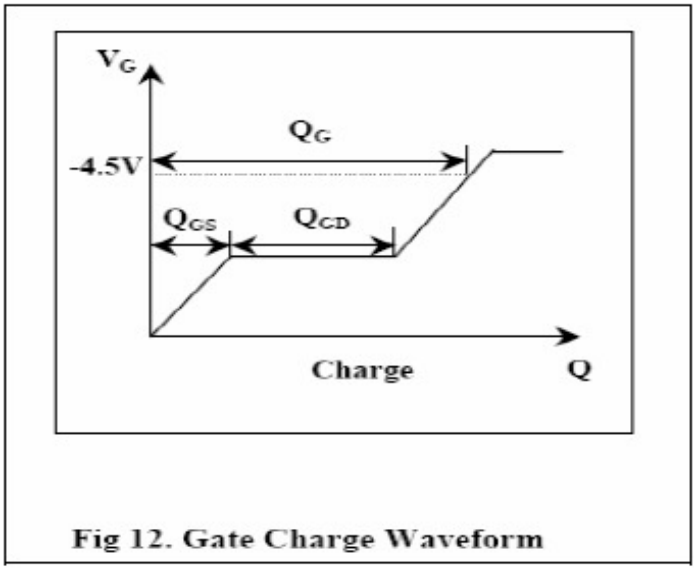
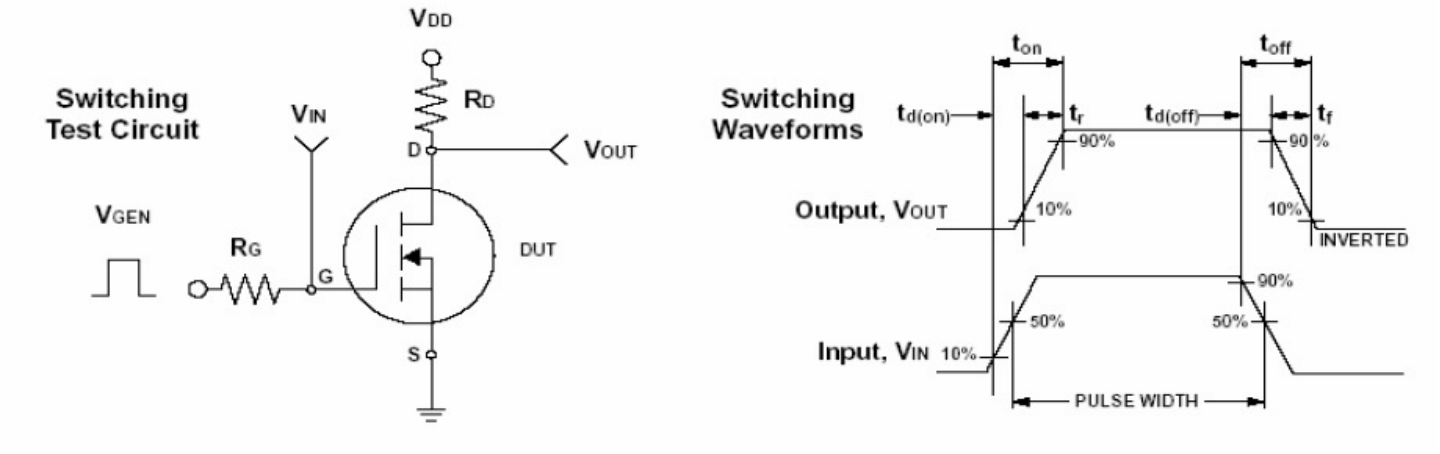


Fig 12. Gate Charge Waveform

◆ Characteristics Curve



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