

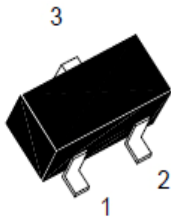
P-Channel Enhancement-Mode MOSFET (-20V, -4.5A)

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

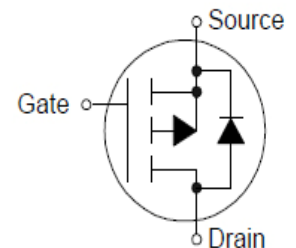
◆ Features

- 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 @T _A =25°C	1.1	W
	Maximum Power Dissipation t @T _A =70°C	0.7	
I _{DM}	Drain Current (Pulsed) *1	-20	A
I _D	Continuous Drain Current @T _A =25°C	-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% .

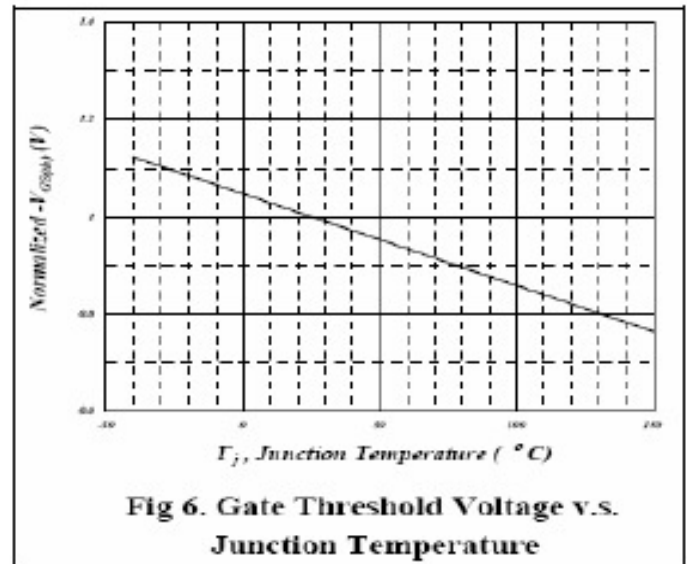
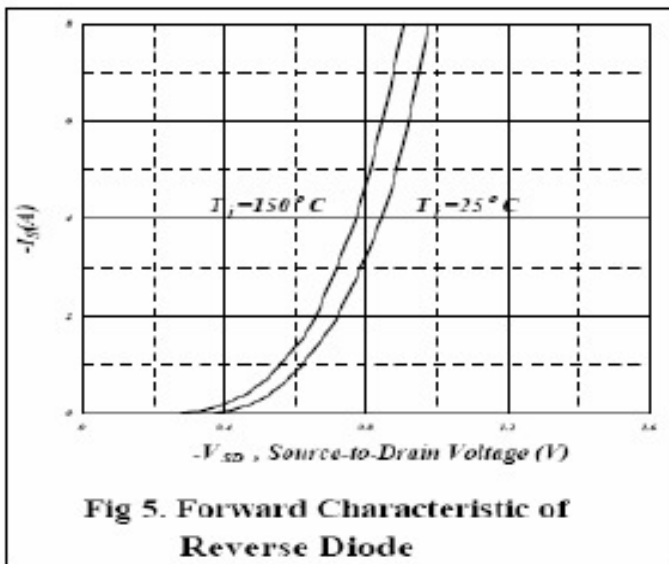
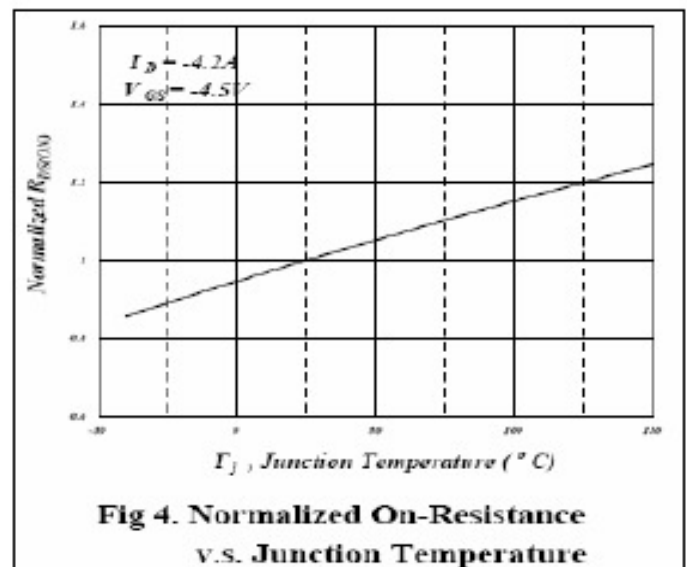
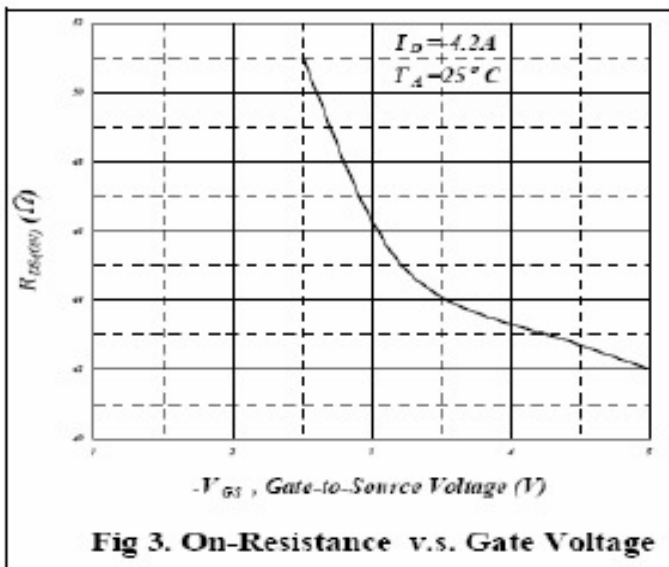
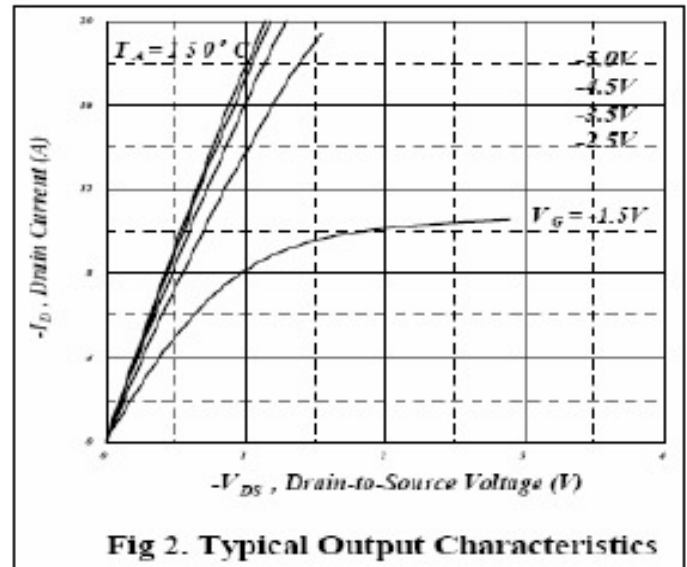
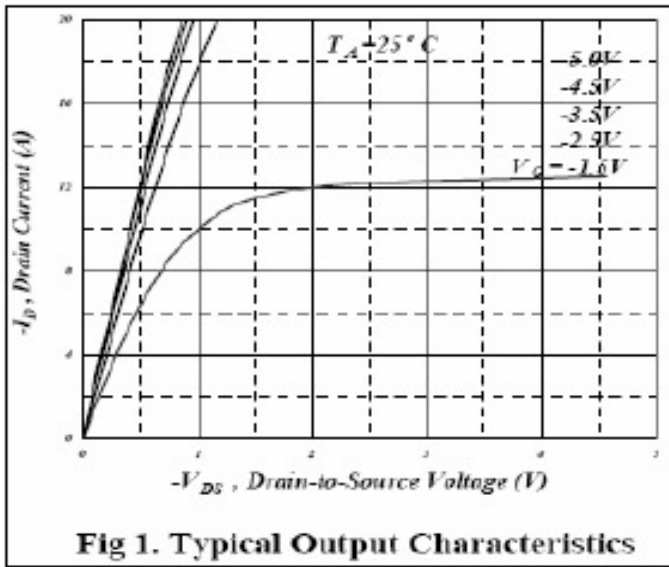
◆ Electrical Characteristics (T_A=25°C, unless otherwise noted)

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	
g _{fs}	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



◆ Characteristics Curve

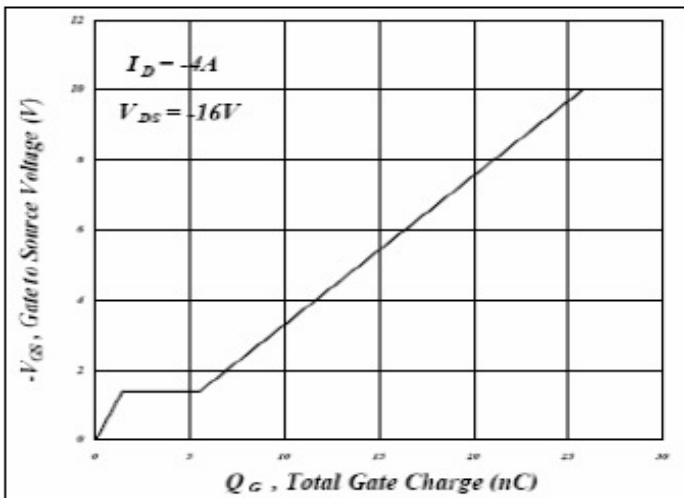


Fig 7. Gate Charge Characteristics

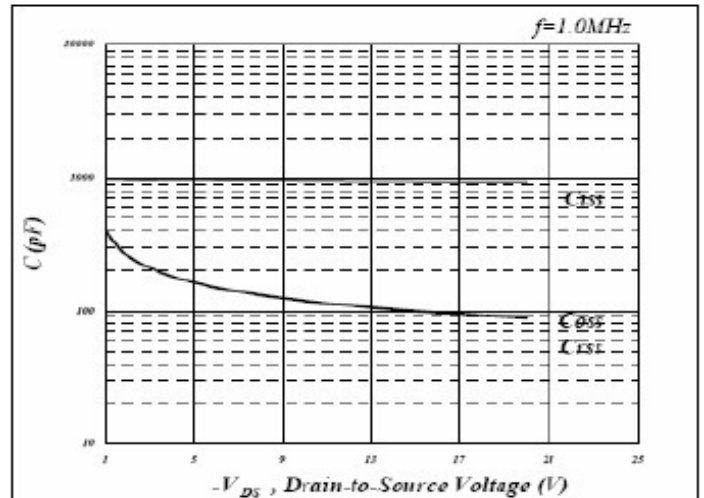


Fig 8. Typical Capacitance Characteristics

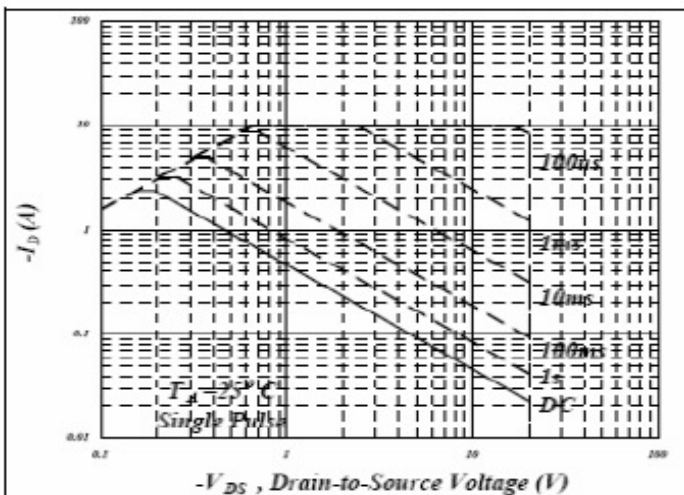


Fig 9. Maximum Safe Operating Area

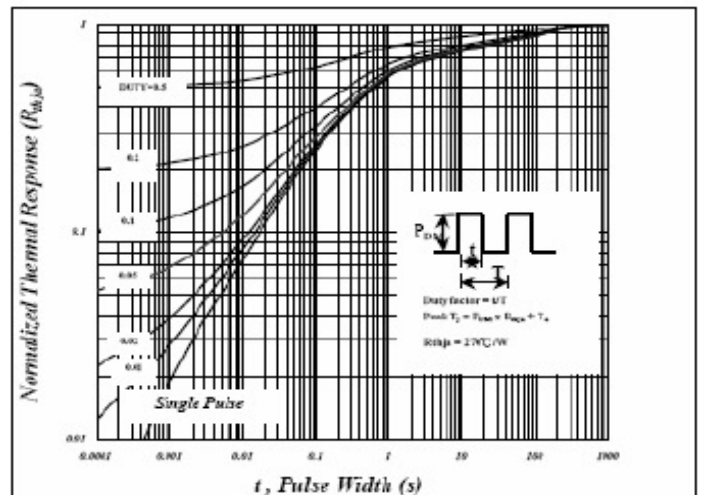


Fig 10. Effective Transient Thermal Impedance

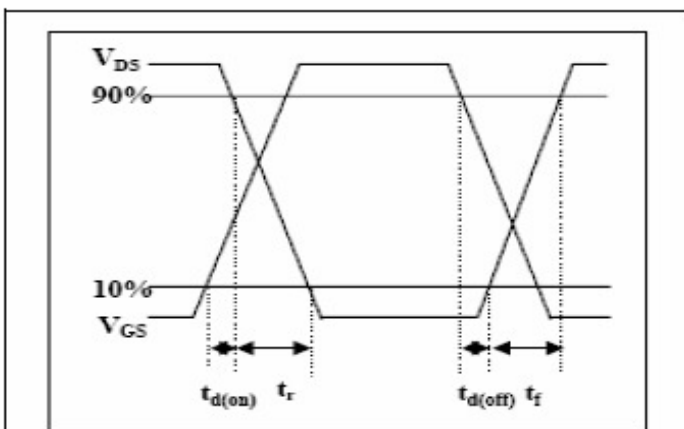


Fig 11. Switching Time Waveform

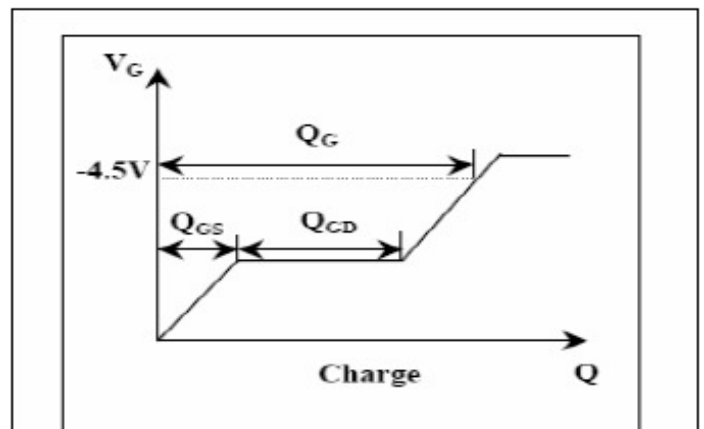


Fig 12. Gate Charge Waveform

◆ Characteristics Curve

