

## Description

These miniature surface mount MOSFETs reduce power loss conserve energy, making this device ideal for use in small power management circuitry.

## General Features

- $V_{DS} = -30V$ ,  $I_D = -4.1A$

$R_{DS(ON)} < 49\text{ m}\Omega$  @  $V_{GS} = -10V$

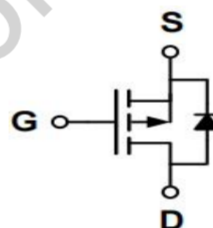
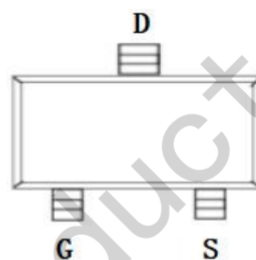
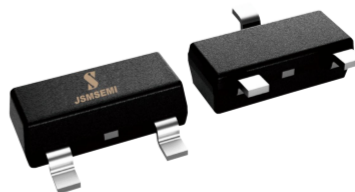
$R_{DS(ON)} < 65\text{ m}\Omega$  @  $V_{GS} = -4.5V$

- High Power and current handing capability
- Lead free product is acquired
- Surface Mount Package

## Application

- PWM applications
- Load switch
- Power management
- Video monitor

## ■ PIN CONFIGURATION



Schematic diagram

## Absolute Maximum Ratings (TA=25°C unless otherwise noted)

Symbol	Parameter	Value	Units	
$V_{DSS}$	Drain-Source Voltage	-30	V	
$I_D$	Drain Current	- Continuous ( $T_C = 25^\circ\text{C}$ )	-4.1	A
		- Continuous ( $T_C = 70^\circ\text{C}$ )	-3.2	A
$I_{DM}$	Drain Current - Pulsed (Note 1)	-15	A	
$V_{GSS}$	Gate-Source Voltage	$\pm 20$	V	
$P_D$	Power Dissipation ( $T_C = 25^\circ\text{C}$ )	1.2	W	
$T_J, T_{STG}$	Operating and Storage Temperature Range	-55 to +150	$^\circ\text{C}$	
$T_L$	Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds	300	$^\circ\text{C}$	

## Thermal Characteristic

Thermal Resistance Junction-to-Ambient	$R_{\theta JA} (\leq 5\text{ s})$	-	$^\circ\text{C/W}$
	$R_{\theta JA}$ (Steady-State)	105	$^\circ\text{C/W}$
Maximum junction-to-ambient	$R_{\theta JC}$	-	$^\circ\text{C/W}$

**Electrical Characteristics (TA=25°C unless otherwise noted)**

Symbol	Parameter	Limit	Min	Typ	Max	Unit
STATIC						
V(BR)DSS	Drain-source breakdown voltage	VGS = 0V, ID = -250μA	-30			V
VGS(th)	Gate threshold voltage	VDS = VGS, ID = -250μA	-1	-1.5	-2.4	V
IGSS	Gate-source leakage current	VDS = 0V, VGS = ±20V			±100	nA
IDSS	Zero gate voltage drain current	VDS = -30V, VGS = 0V			-1	uA
RDS(ON)	Drain-source on-resistance	VGS = -10V, ID = -4.1A		36	49	mΩ
		VGS = -4.5V, ID = -3.5A		52	65	
DYNAMIC PARAMETERS						
Qg	Total Gate Charge	VDS = -15V, VGS = -10V, ID = -4.1A(Note 2)		11.65		nC
Qgs	Gate-Source Charge			2.32		
Qgd	Gate-Drain Charge			2.08		
Ciss	Input capacitance	VDS = -15V, VGS = 0V, f = 1 MHz		572		nF
Coss	Output Capacitance			82		
Crss	Reverse Transfer Capacitance			70		
Rg	Gate Resistance	f = 1 MHz		-		Ω
td(on)	Turn-On Delay Time	VDD = -15V, VGEN = -10V ID = -3.5A, RG = 2.5Ω(Note 2)		3.8		ns
tr	Rise Time			17.6		
td(off)	Turn-Off Delay Time			17.8		
tf	Fall Time			21.8		
IS	Maximum Continuous Drain-Source Diode Forward Current		-	-	-4.1	V
ISM	Maximum Pulsed Drain-Source Diode Forward Current		-	-	-16	A
VSD	Drain to Source Diode Forward Voltage, VGS = 0V, ISD = -4.1A, TJ = 25°C		-	-	-1.2	V

**Notes:**

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 0.5%

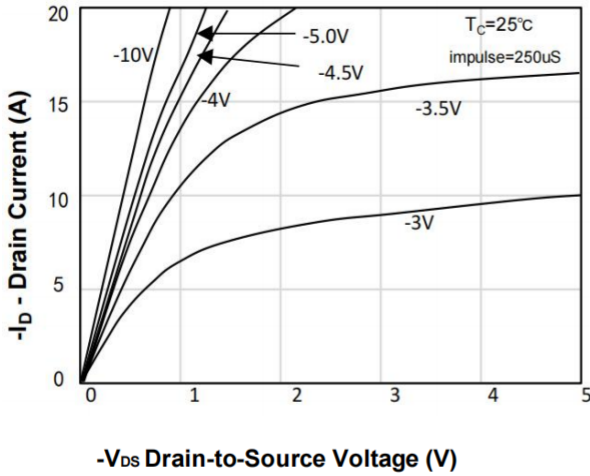


Figure 1. On-Region Characteristics

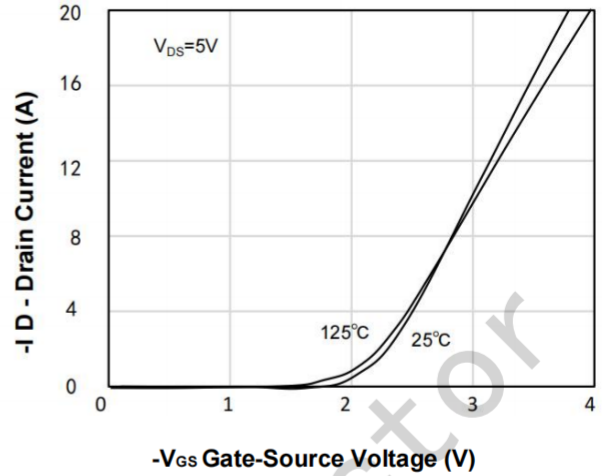


Figure 2. Transfer Characteristics

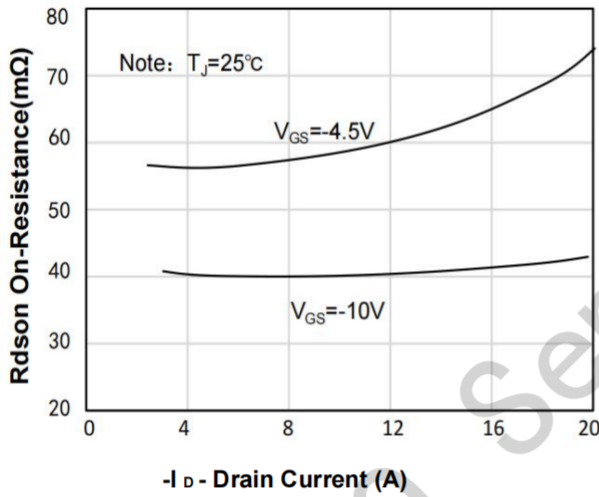


Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

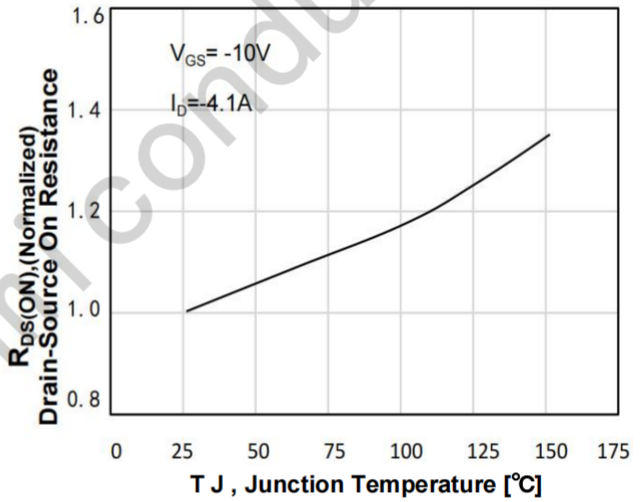


Figure 4. On-Resistance Variation vs Temperature

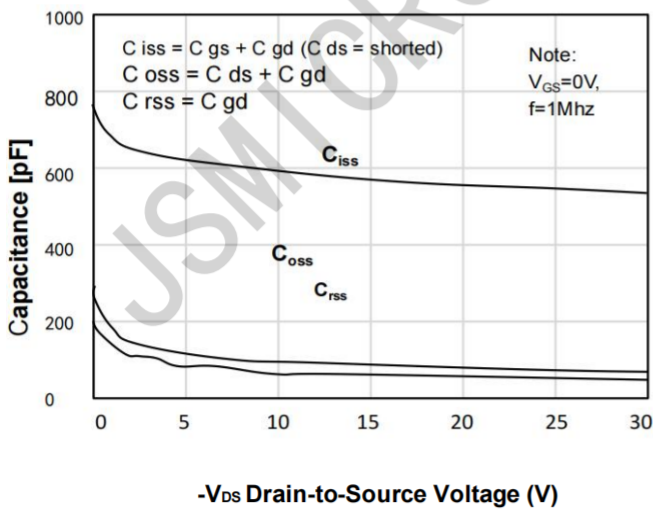


Figure 5. Capacitance Characteristics

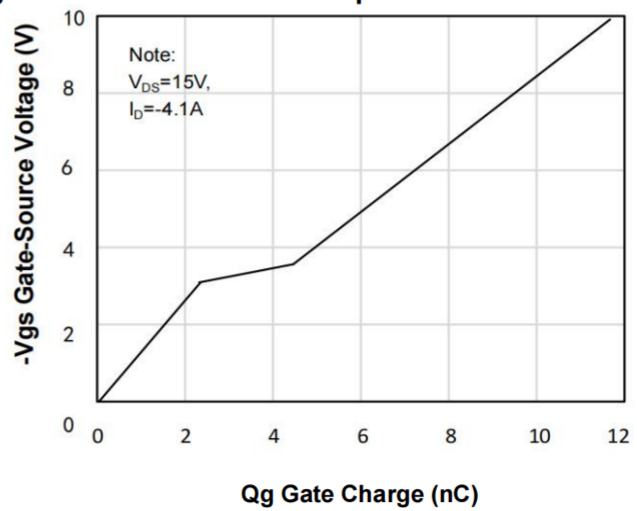


Figure 6. Gate Charge Characteristics

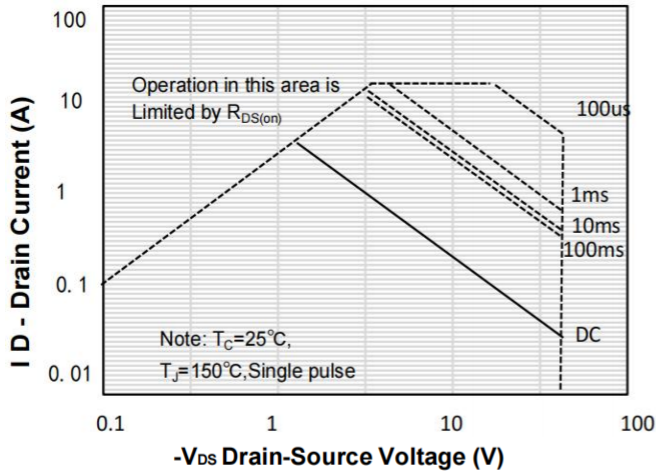


Figure 7. Maximum Safe Operating Area

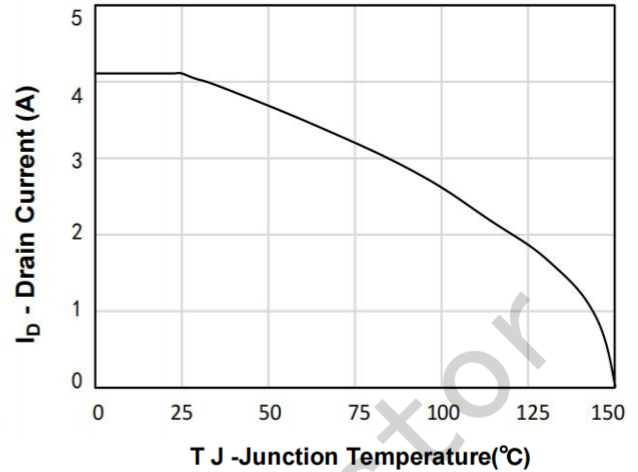


Figure 8. Maximum Continuous Drain Current vs Temperature

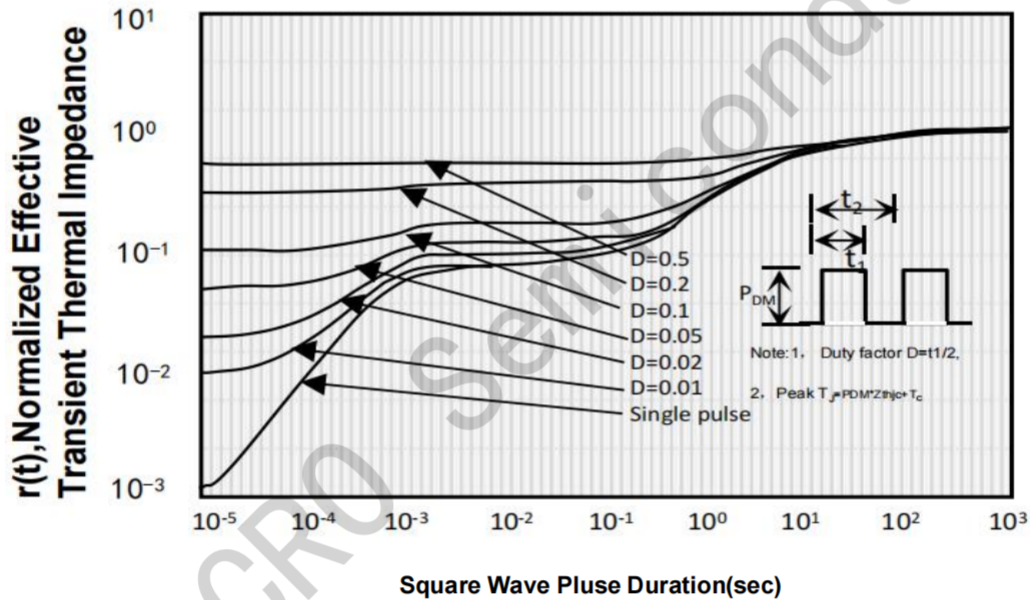
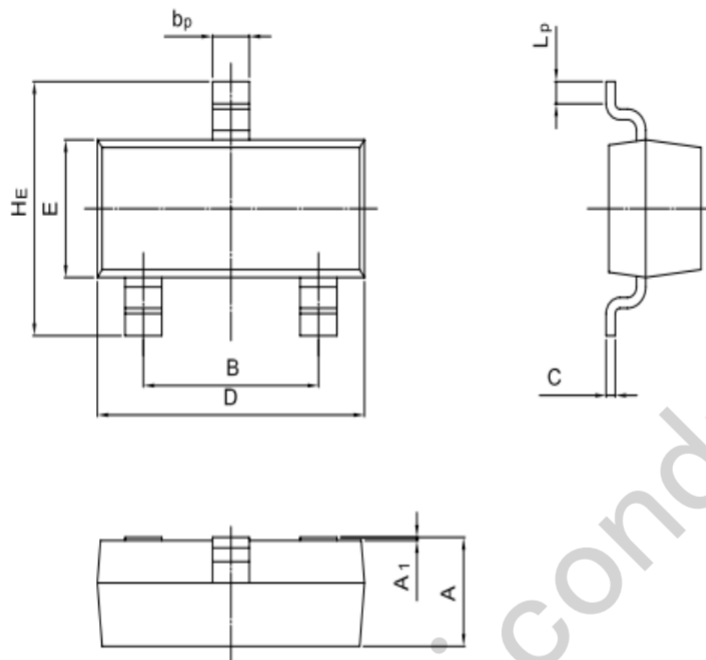


Figure 9. Transient Thermal Response Curve

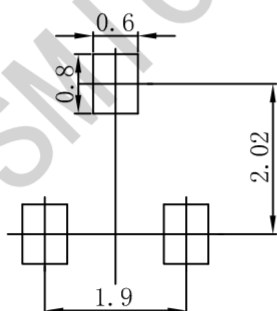
## Package Information

SOT-23



UNIT	A	B	$b_p$	C	D	E	$HE$	$A_1$	$L_p$
mm	1.40 0.95	2.04 1.78	0.50 0.35	0.19 0.08	3.10 2.70	1.65 1.20	3.00 2.20	0.100 0.013	0.50 0.20

### SOT-23 Suggested Pad Layout



**Note:**

1. Controlling dimension: in millimeters.
2. General tolerance:  $\pm 0.05$  mm.
3. The pad layout is for reference purposes only.