

SOT-23 Plastic-Encapsulate MOSFETS

Features

- $V_{DS} = -30V$
- $I_D = -4.2A$
- $R_{DS(on)}@V_{GS} = -10V < 65m\Omega$
- $R_{DS(on)}@V_{GS} = -4.5V < 75m\Omega$
- $R_{DS(on)}@V_{GS} = -2.5V < 90m\Omega$
- Trench Power LV MOSFET technology
- High Speed switching

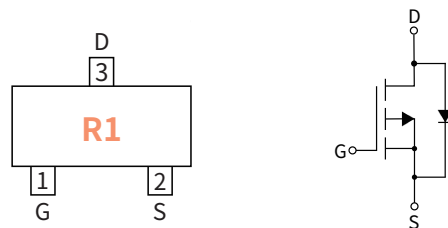
Applications

- Battery protection
- Load switch
- Power management

Mechanical Data

- Case: SOT-23
Molding compound meets UL 94V-0 flammability rating, RoHS-compliant, halogen-free
- Terminals: Solder plated, solderable per MIL-STD-750, Method 2026

Function Diagram



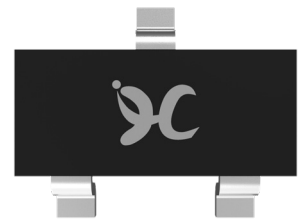
Drain-source Voltage

-30 V

Drain Current

-4.2 Ampere

SOT-23



Maximum Ratings (Ta=25°C Unless otherwise specified)

PARAMETER	SYMBOL	UNIT	VALUE
Drain-source Voltage	V_{DS}	V	-30
Gate-source Voltage	V_{GS}	V	± 12
Drain Current	I_D	A	-4.2
Pulsed Drain Current ⁽¹⁾	I_{DM}	A	-27
Total Power Dissipation ⁽²⁾	P_D	W	0.35
Junction temperature	T_J	°C	-55 ~ +150
Storage temperature	T_{stg}	°C	-55 ~ +150
Thermal Resistance Junction-to-Ambient @ Steady State ⁽²⁾	$R_{\theta JA}$	°C / W	357

Ordering Information

PACKAGE	PACKAGE CODE	UNIT WEIGHT(g)	REEL(pcs)	BOX(pcs)	CARTON(pcs)	DELIVERY MODE
SOT-23	R1	0.008	3000	30000	120000	7"

● Static Parameter Characteristics (Ta=25°C Unless otherwise specified)

PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=-250\mu A$	V	-30	—	—
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-24V, V_{GS}=0V$	μA	—	—	-1.0
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 12V, V_{DS}=0V$	nA	—	—	± 100
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	V	-0.7	-0.9	-1.3
Static Drain-Source On-Resistance ⁽³⁾	$R_{DS(on)}$	$V_{GS}=-10V, I_D=-4.2A$	m Ω	—	50	65
		$V_{GS}=-4.5V, I_D=-4.0A$		—	60	75
		$V_{GS}=-2.5V, I_D=-1.0A$		—	75	90
Forward Transconductance	g_{FS}	$V_{DS}=-5.0V, I_D=-5.0A$	S	7.0	—	—
Diode Forward Voltage	V_{SD}	$I_S=-1.0A, V_{GS}=0V$	V	—	—	-1.0
Maximum Body-Diode Continuous Current	I_S	—	A	—	—	-1.0

● Dynamic Parameters (Ta=25°C Unless otherwise specified)

PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Input Capacitance	C_{iss}	$V_{DS}=-15V, V_{GS}=0V, f=1MHz$	pF	—	954	—
Output Capacitance	C_{oss}			—	115	—
Reverse Transfer Capacitance	C_{rss}			—	77	—

● Switching Parameters (Ta=25°C Unless otherwise specified)

PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Turn-on Delay Time	$t_{D(on)}$	$V_{GS}=-10V, V_{DS}=-15V,$ $R_L=3.6\Omega, R_{GEN}=6.0\Omega$		—	—	6.3
Turn-on Rise Time	t_r			—	—	3.2
Turn-off Delay Time	$t_{D(off)}$			—	—	38.2
Turn-off fall Time	t_f			—	—	12

Note :

(1) Repetitive rating, pulse width limited by junction temperature $T_{J(Max)}=150^\circ C$. Ratings are based on low frequency and duty cycles to keep initial $T_J=25^\circ C$.

(2) The value of P_D and $R_{\theta JA}$ is measured with the device mounted on 1 in² FR-4 board with 2oz. Copper, in a still air environment with $T_A=25^\circ C$.

(3) Pulse test: Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.

● Ratings And Characteristics Curves (Ta=25°C Unless otherwise specified)

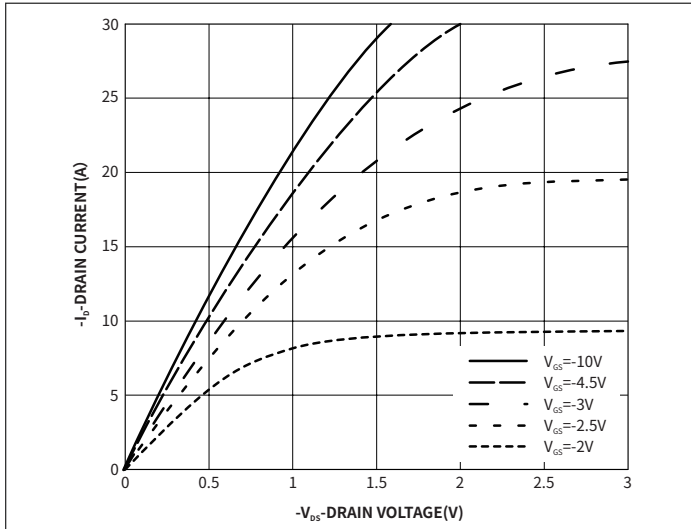


Fig.1 Output Characteristics

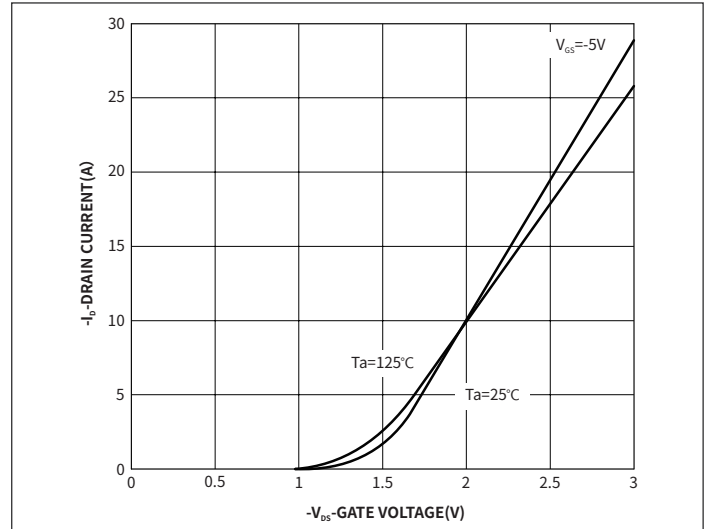


Fig.2 Transfer Characteristics

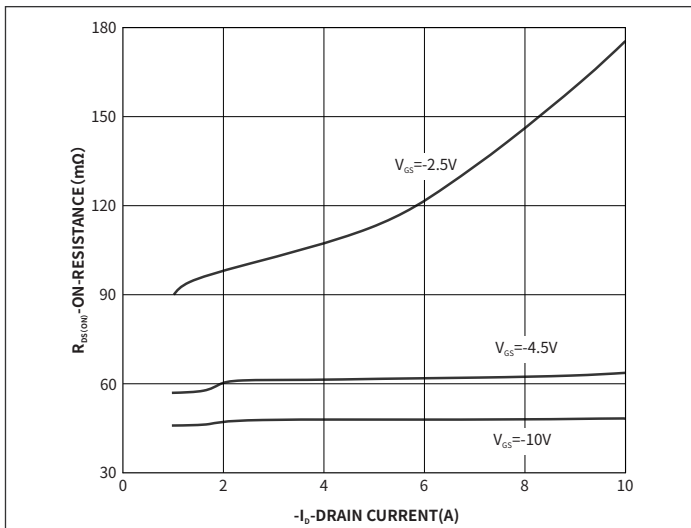


Fig.3 On-Resistance vs. Drain Current and Gate Voltage

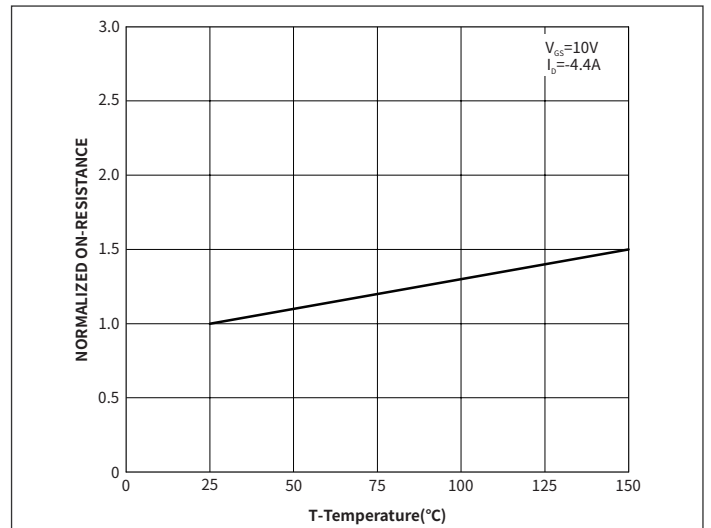


Fig.4 On-Resistance vs. Junction Temperature

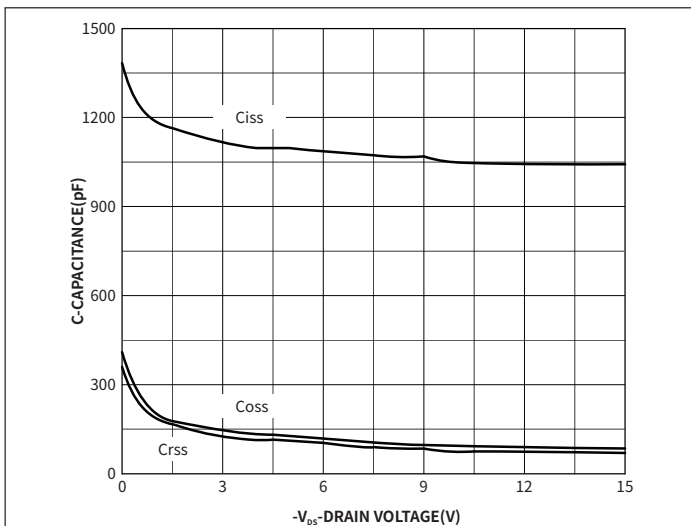


Fig.5 Capacitance Characteristics

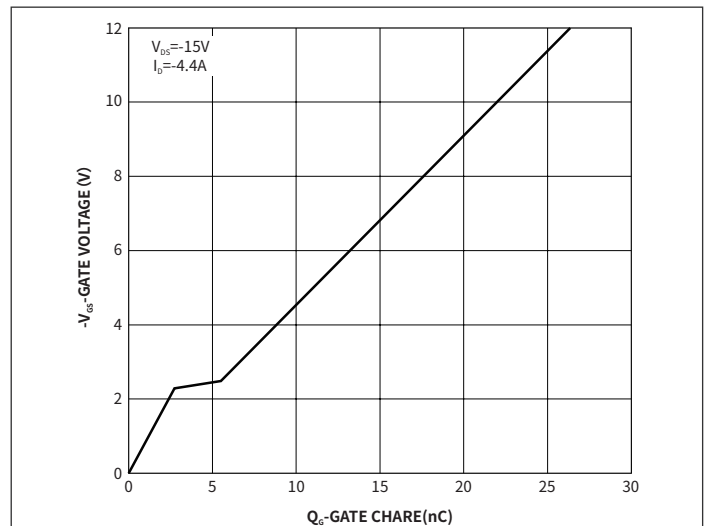
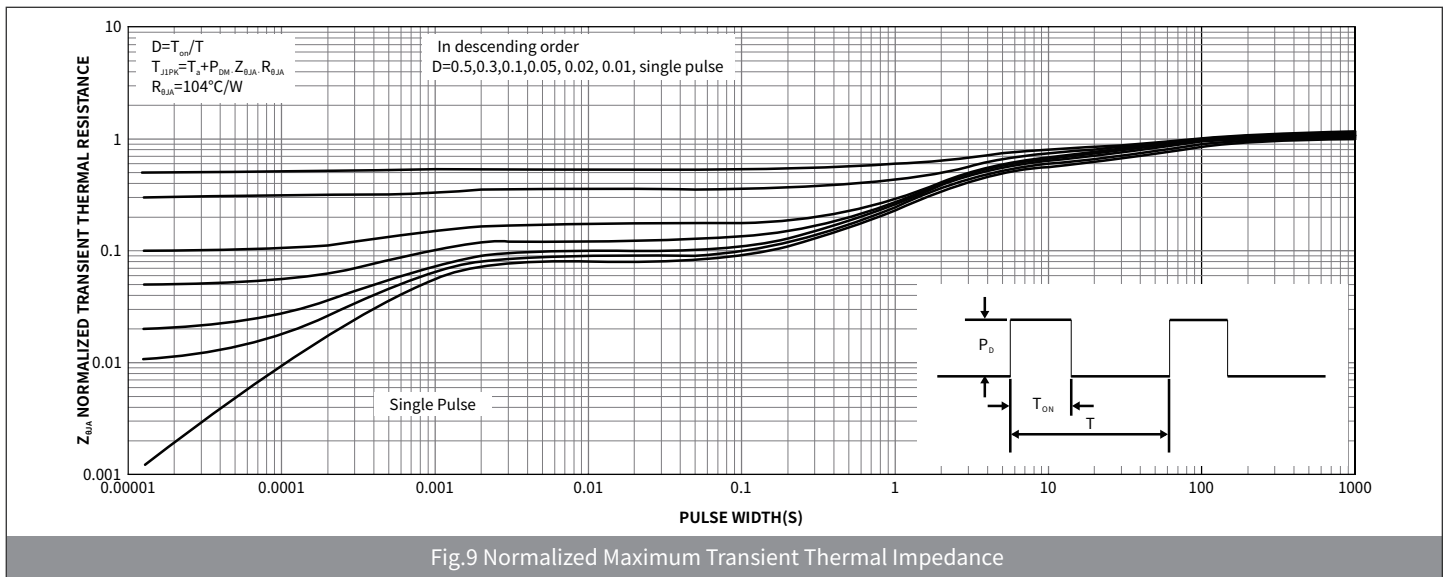
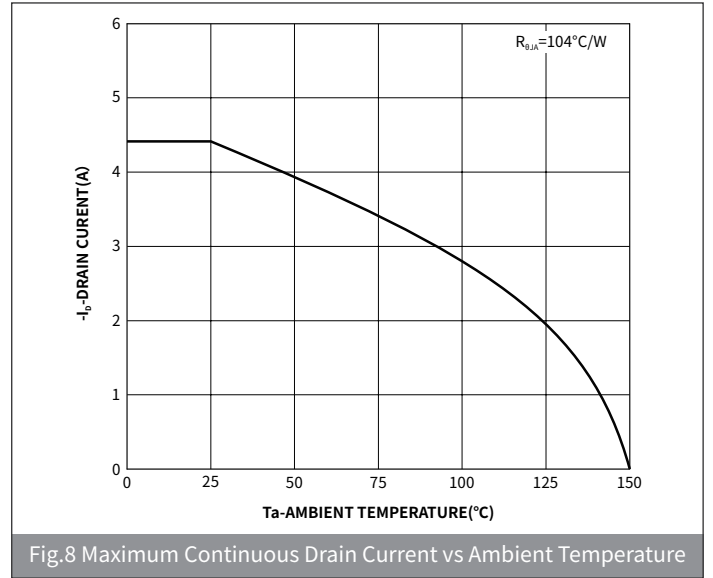
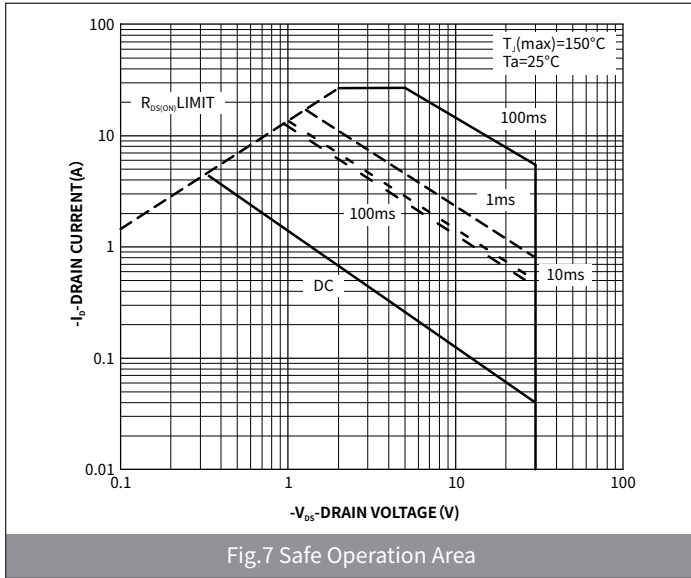


Fig.6 Gate Charge

● Ratings And Characteristics Curves (Ta=25°C Unless otherwise specified)



● Package Outline Dimensions (SOT-23)

Symbol	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	0.90	1.15	0.035	0.045
A1	-	0.10	-	0.004
A2	0.90	1.05	0.035	0.041
b	0.30	0.50	0.012	0.020
c	0.10	0.20	0.004	0.008
D	2.80	3.00	0.110	0.118
E	1.20	1.40	0.047	0.055
E1	2.25	2.55	0.089	0.100
e	0.950TYP		0.037TYP	
e1	1.80	2.00	0.071	0.079
L	0.550REF		0.022REF	
L1	0.30	0.50	0.012	0.020
θ	-	8°	-	8°

● Suggested Pad Layout

Symbol	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
J	0.75	0.85	0.030	0.033
K	0.85	0.95	0.033	0.037
M	1.95	2.05	0.077	0.081
N	1.85	1.95	0.073	0.077