

SOT-23 Plastic-Encapsulate MOSFETS

Features

- $V_{DS}=20V$
- $I_D=6.5A$
- $R_{DS(on)}@V_{GS}=4.5V < 22m\Omega$
- $R_{DS(on)}@V_{GS}=2.5V < 26m\Omega$
- Trench Power MV MOSFET technology
- Voltage controlled small signal switch
- Fast Switching Speed

Applications

- Battery operated systems
- Solid-state relays
- Direct logic-level interface: TTL/CMOS

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

Reference News

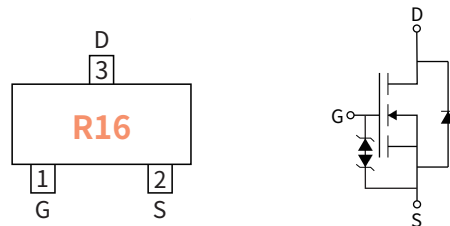
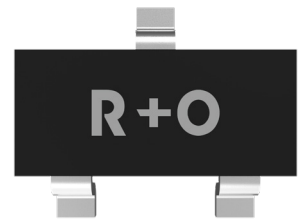
Drain-source Voltage

20 V

Drain Current

6.5 Ampere

SOT-23



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

PARAMETER		SYMBOL	UNIT	VALUE
Drain-source Voltage		V_{DS}	V	20
Gate-source Voltage		V_{GS}	V	± 10
Drain Current	$T_A=25^\circ C$ @ Steady State	I_D	A	6.5
Pulsed Drain Current ⁽¹⁾		I_{DM}	A	28
Total Power Dissipation @ $T_A=25^\circ C$		P_D	W	1.3
Thermal Resistance Junction-to-Ambient @ Steady State ⁽²⁾		$R_{\theta JA}$	$^\circ C / W$	96
Junction and Storage Temperature Range		T_J, T_{STG}	$^\circ C$	-55 ~ +150

Note:

(1) Pulse test; Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$

(2) Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch.

Ordering Information

PACKAGE	PACKAGE CODE	UNIT WEIGHT(g)	REEL(pcs)	BOX(pcs)	CARTON(pcs)	DELIVERY MODE
SOT-23	R1	0.008	3000	45000	180000	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	20	—	—
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=20V, V_{GS}=0V$	μA	—	—	1.0
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 10V, V_{DS}=0V$	μA	—	—	± 10
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	V	0.45	0.62	1.0
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=4.5V, I_D=6.5A$	m Ω	—	16	22
		$V_{GS}=2.5V, I_D=4.0A$		—	18	26
		$V_{GS}=1.8V, I_D=2.0A$		—	34	48
Forward Transconductance	g_{fs}	$V_{DS}=5.0V, I_D=6.5A$	S	—	50	—
Diode Forward Voltage	V_{SD}	$I_S=1.0A, V_{GS}=0V$	V	—	—	1.0

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

PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Input Capacitance	C_{iss}	$V_{DS}=10V$ $V_{GS}=0V$ $f=1MHz$	pF	—	890	—
Output Capacitance	C_{oss}			—	133	—
Reverse Transfer Capacitance	C_{rss}			—	120	—

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

PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Total Gate Charge	Q_g	$V_{GS}=4.5V$ $V_{DS}=10V$ $I_D=4.0A$	nC	—	11	—
Gate-Source Charge	Q_{gs}			—	2.0	—
Gate-Drain Charge	Q_{gd}			—	3.0	—
Reverse Recovery Charge	Q_{rr}	$I_F=4.0A$ $di/dt=-100A/\mu s$		—	6.8	—
Reverse Recovery Time	t_{rr}			—	31	41
Turn-on Delay Time	$t_{D(on)}$	$V_{GS}=4.5V$ $V_{DS}=10V$ $R_G=3.0\Omega$ $I_D=3.0A$	ns	—	7.0	—
Turn-on Rise Time	t_r			—	45	—
Turn-off Delay Time	$t_{D(off)}$			—	30	—
Turn-off fall Time	t_f			—	52	—

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

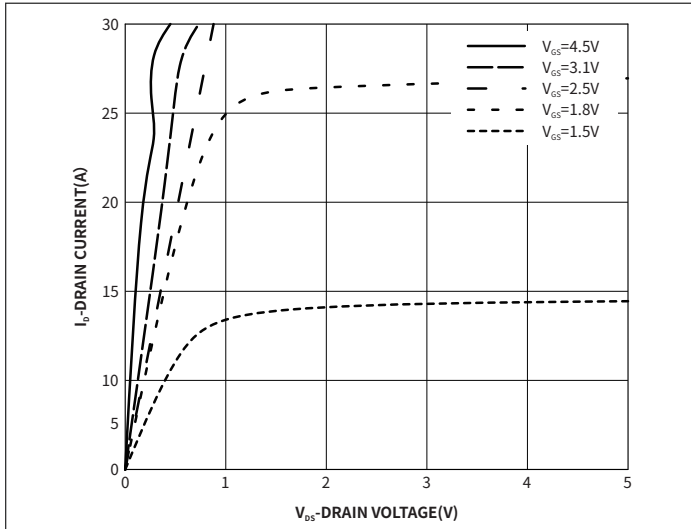


Fig.1 Output Characteristics

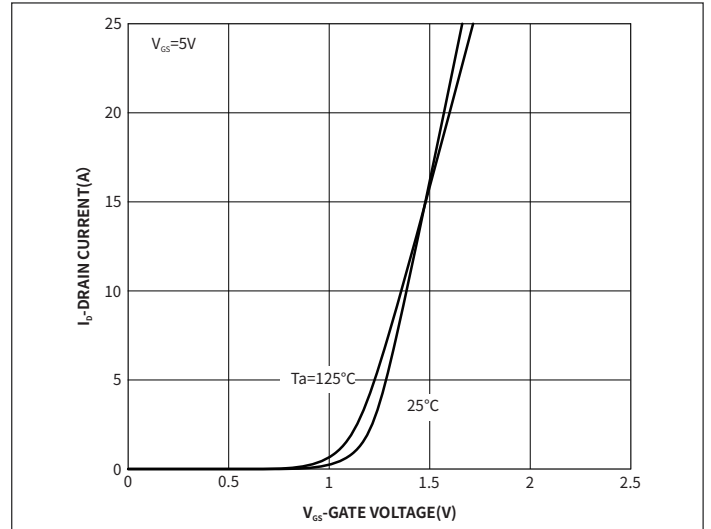


Fig.2 Transfer Characteristics

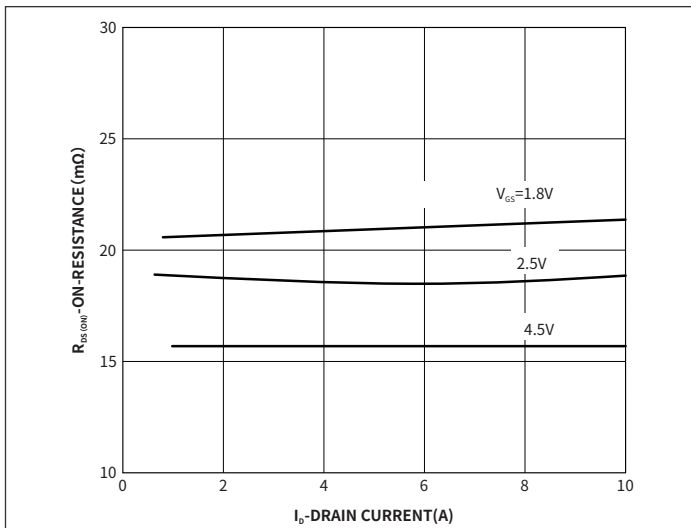


Fig.3 On-Resistance vs. Drain Current and Gate Voltage

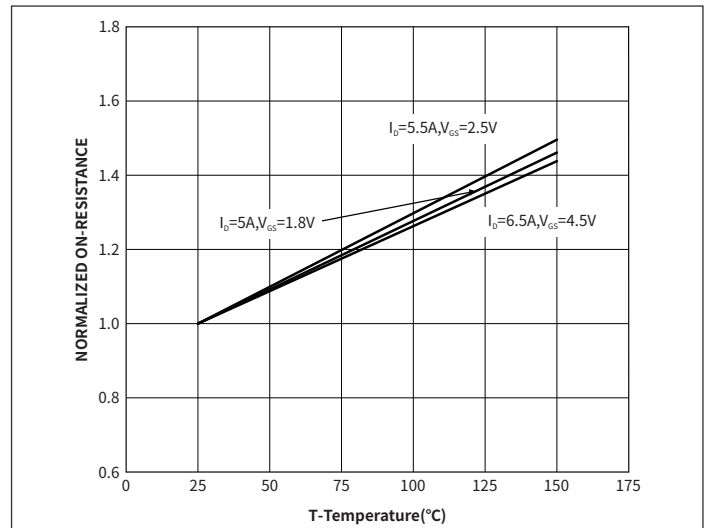


Fig.4 On-Resistance vs. Junction Temperature

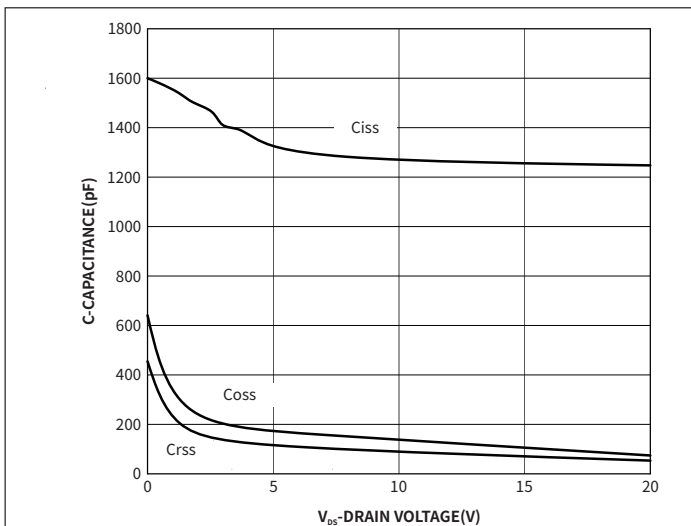


Fig.5 Capacitance Characteristics

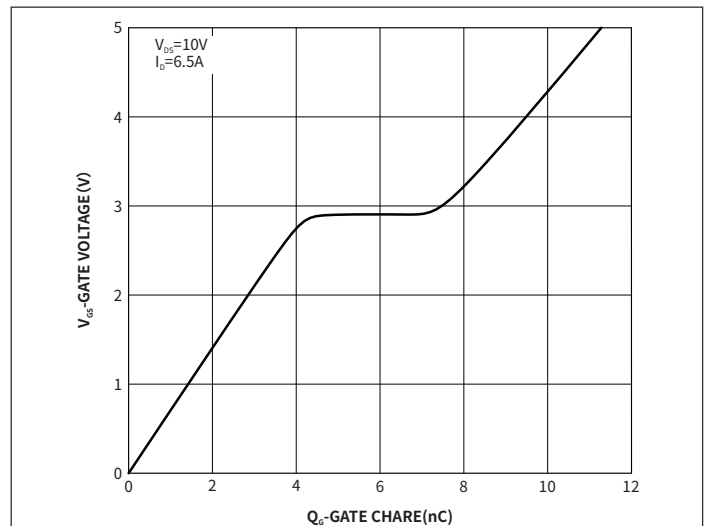
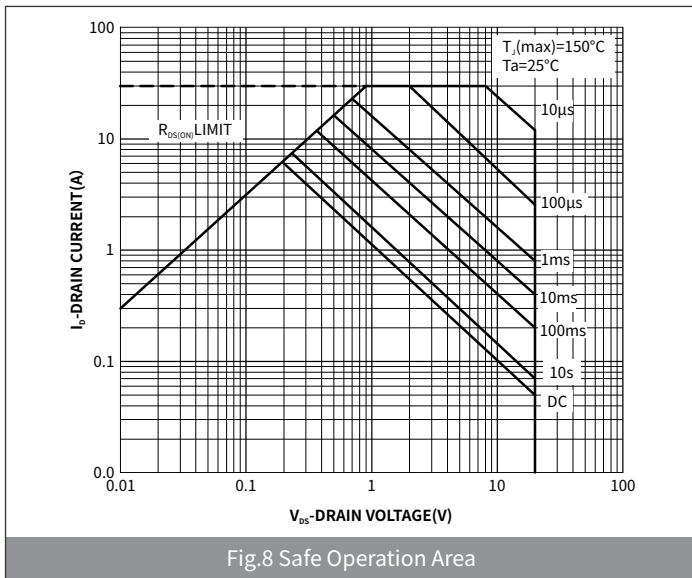
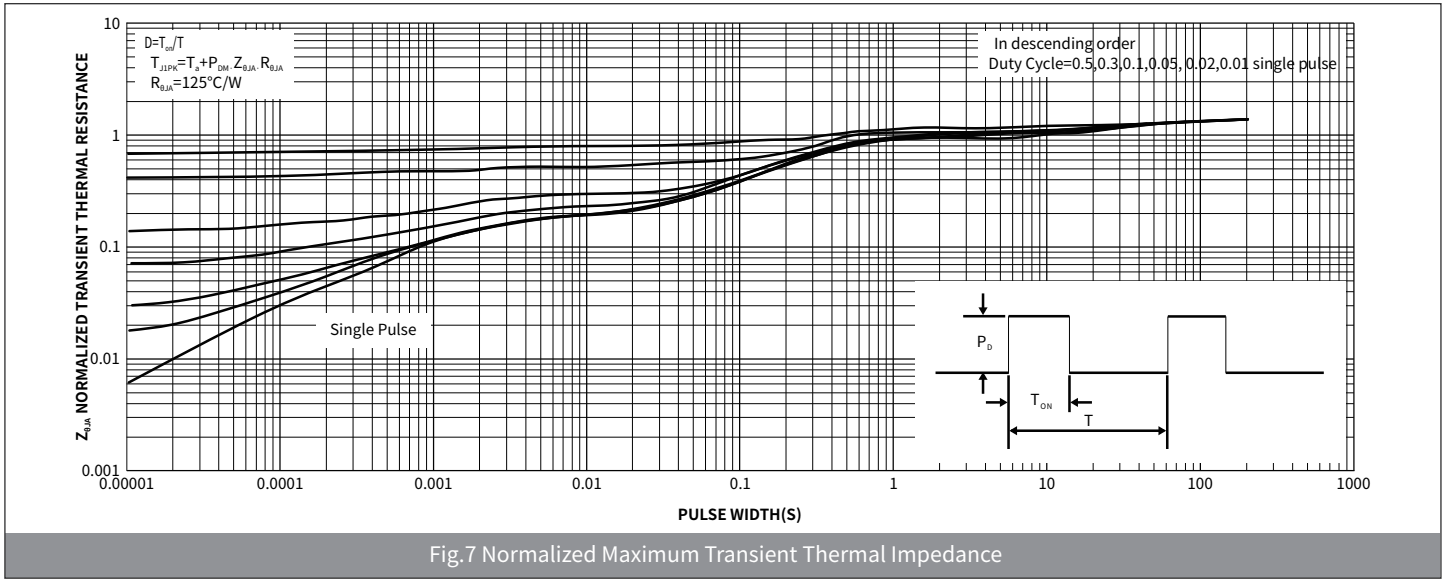


Fig.6 Gate Charge

● 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	0.80	-	0.031	-
K	-	0.90	-	0.035
M	2.00	-	0.078	-
N	-	1.90	-	0.074

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