

## SOT-23 Plastic-Encapsulate MOSFETS

### Features

- $V_{DS} = -20V$
- $I_D = -5.0A$
- $R_{DS(on)}@V_{GS} = -4.5V < 43m\Omega$
- $R_{DS(on)}@V_{GS} = -2.5V < 55m\Omega$
- 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

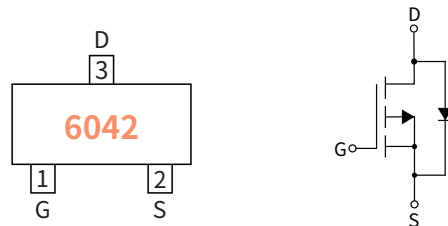
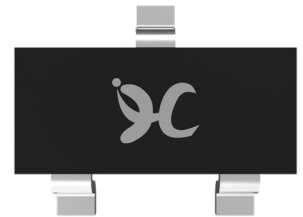
**Drain-source Voltage**

-20 V

**Drain Current**

-5.0 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	$\pm 10$
Drain Current	$T_A = 25^\circ C$ @ Steady State	$I_D$	A	-5.0
	$T_A = 70^\circ C$ @ Steady State			-4.0
Pulsed Drain Current <sup>(1)</sup>		$I_{DM}$	A	-30
Total Power Dissipation @ $T_A = 25^\circ C$		$P_D$	W	1.5
Thermal Resistance Junction-to-Ambient @ Steady State <sup>(2)</sup>		$R_{\theta JA}$	$^\circ C / W$	357
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	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	-20	—	—
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=-20V, V_{GS}=0V$	$\mu A$	—	—	-1.0
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS}=\pm 10V, V_{DS}=0V$	nA	—	—	$\pm 100$
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	V	-0.3	—	-0.9
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=-4.5V, I_D=-4.0A$	m $\Omega$	—	—	43
		$V_{GS}=-2.5V, I_D=-4.0A$		—	—	55
		$V_{GS}=-1.8V, I_D=-2.0A$		—	—	75
		$V_{GS}=-1.5V, I_D=-1.0A$		—	—	100
Forward Transconductance	$g_{fs}$	$V_{DS}=-5.0V, I_D=-4.0A$	S	—	20	—
Diode Forward Voltage	$V_{SD}$	$I_S=-1.0A, V_{GS}=0V$	V	—	—	-1.0
Maximum Body-Diode Continuous Current	$I_S$	—	A	—	—	-2.0

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

PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Input Capacitance	$C_{iss}$	$V_{DS}=-10V$ $V_{GS}=-10V$ $f=1MHz$	pF	600	—	905
Output Capacitance	$C_{oss}$			80	—	150
Reverse Transfer Capacitance	$C_{rss}$			48	—	115

● **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	7.4	—	11
Gate-Source Charge	$Q_{gs}$			0.8	—	1.2
Gate-Drain Charge	$Q_{gd}$			1.3	—	3.1
Reverse Recovery Charge	$Q_{rr}$	$I_F=-4.0A$ $di/dt=100A/us$		40	—	62
Reverse Recovery Time	$t_{rr}$			20	—	32
Turn-on Delay Time	$t_{d(on)}$	$V_{GS}=-4.5V, V_{DS}=10V$ $R_L=2.5\Omega, R_{GEN}=3.0\Omega$	ns	—	13	—
Turn-on Rise Time	$t_r$			—	9.0	—
Turn-off Delay Time	$t_{d(off)}$			—	19	—
Turn-off fall Time	$t_f$			—	29	—

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

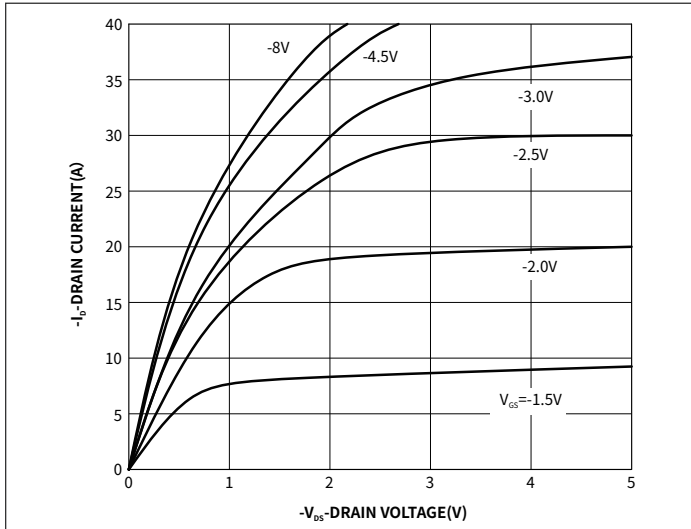


Fig.1 Output Characteristics

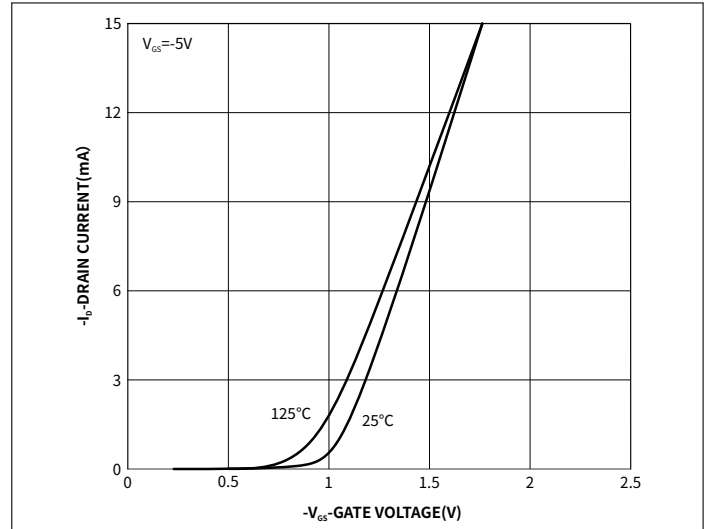


Fig.2 Transfer Characteristics

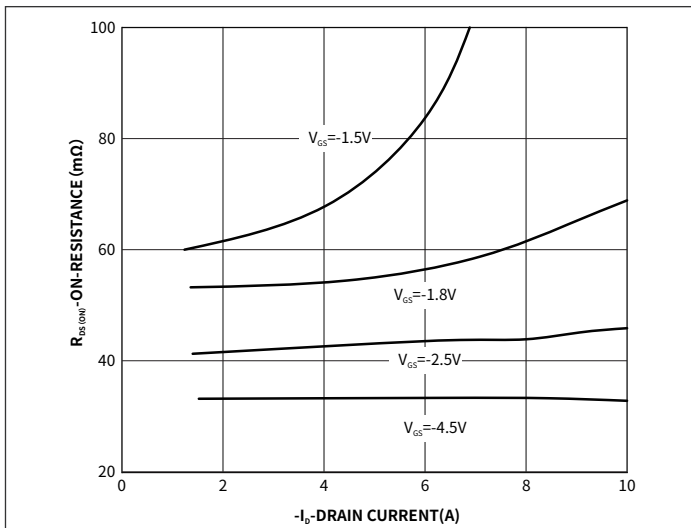


Fig.3 On-Resistance vs. Drain Current and Gate Voltage

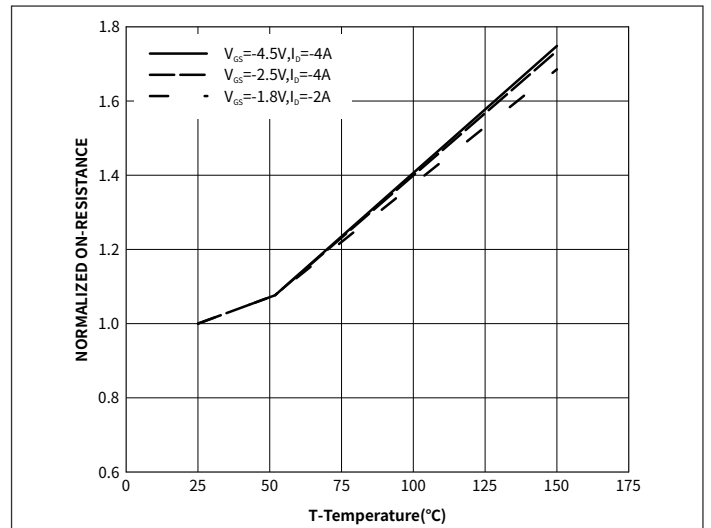


Fig.4 On-Resistance vs. Junction Temperature

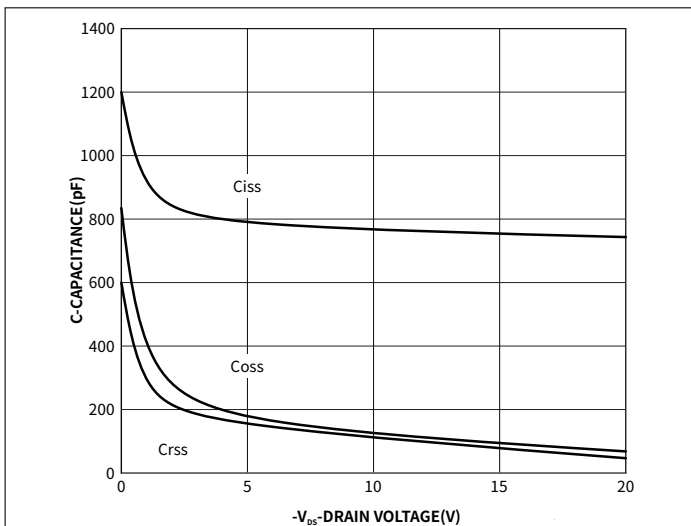


Fig.5 Capacitance Characteristics

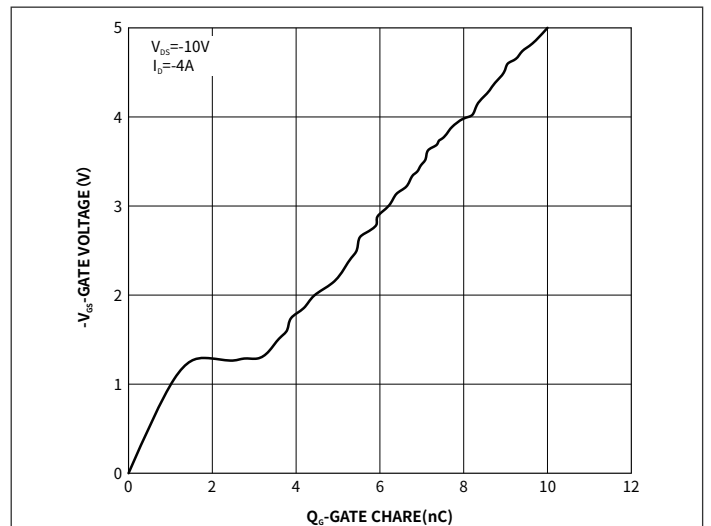
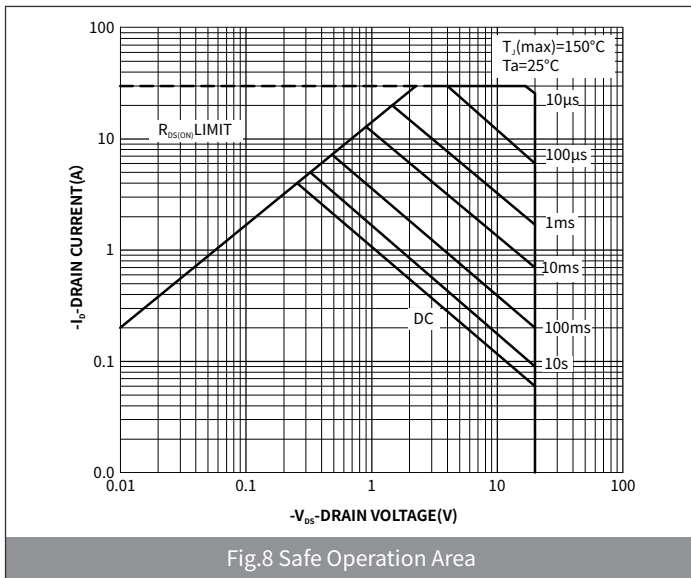
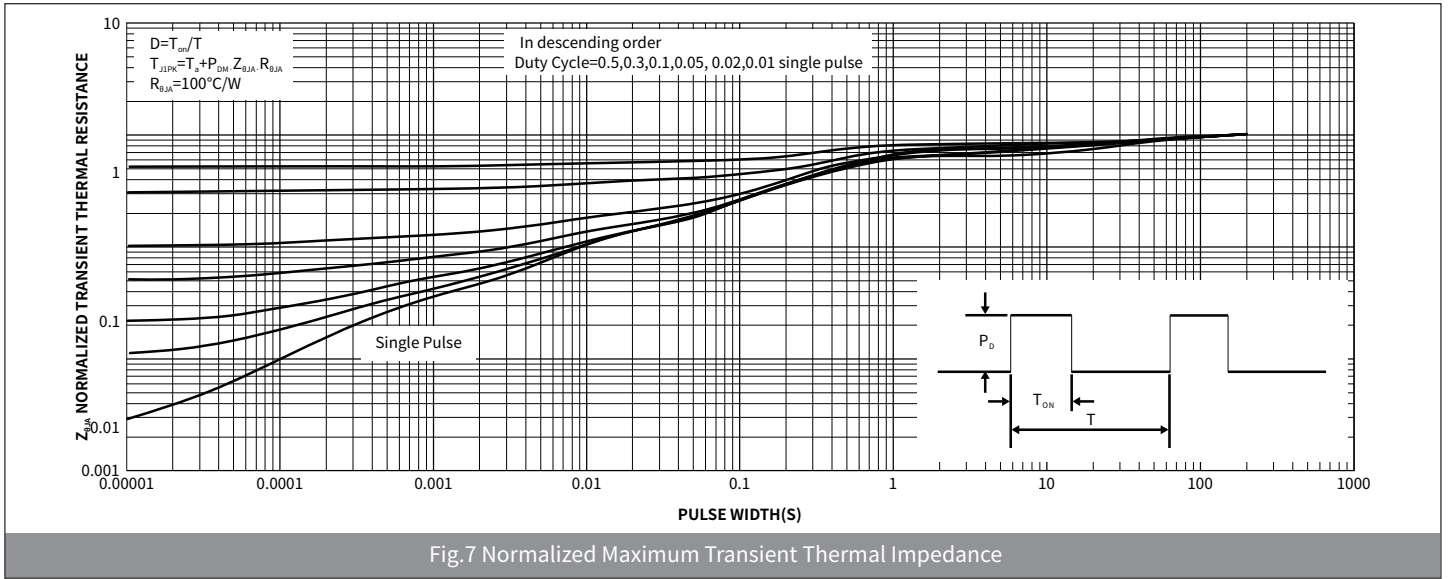


Fig.6 Gate Charge

● 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
$\theta$	-	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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