

MSKSEMI 美森科

SEMICONDUCTOR



ESD



TVS



TSS



MOV



GDT



PLED

TN2404K-T1-E3-MS

Product specification

Description

These N-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These devices are well suited for high efficiency fast switching applications.

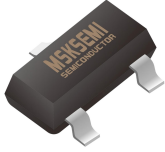
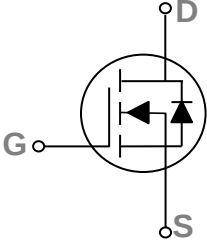
General Features

- 240V,RDS(ON) =8Ω@VGS=10V
- Improved dv/dt capability
- Fast switching
- Green Device Available

Application

- Motor Drive
- Power Tools
- LED Lighting

Reference News

SOT-23	N-Channel MOSFET	MARKING
		

Absolute Maximum Ratings $T_C=25^{\circ}\text{C}$ unless otherwise noted

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	240	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Drain Current - Continuous ($T_A=25^{\circ}\text{C}$)	0.25	A
	Drain Current - Continuous ($T_A=70^{\circ}\text{C}$)	0.17	A
I_{DM}	Drain Current - Pulsed ¹	0.8	A
P_D	Power Dissipation ($T_A=25^{\circ}\text{C}$)	0.5	W
	Power Dissipation - Derate above 25°C	0.4	mW/ $^{\circ}\text{C}$
T_{STG}	Storage Temperature Range	-55 to 150	$^{\circ}\text{C}$
T_J	Operating Junction Temperature Range	-55 to 150	$^{\circ}\text{C}$

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to ambient	---	80	$^{\circ}\text{C}/\text{W}$

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

Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V , I _D =250uA	240	---	---	V
I _{DSS}	Drain-Source Leakage Current	V _{DS} =200V , V _{GS} =0V , T _J =25°C	---	---	1	uA
		V _{DS} =100V , V _{GS} =0V , T _J =75°C	---	---	5	uA
I _{GSS}	Gate-Source Leakage Current	V _{GS} = ±20V , V _{DS} =0V	---	---	±100	nA

On Characteristics

R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =10V , I _D =0.2A	---	---	8	Ω
		V _{GS} =4.5V , I _D =0.1A	---	---	9	Ω
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	0.8	1.5	2.5	V
g _{fs}	Forward Transconductance	V _{DS} =10V , I _D =0.08A	---	0.15	---	S

Dynamic and switching Characteristics

Q _g	Total Gate Charge ^{2, 3}	V _{DS} =190V , V _{GS} =10V , I _D =0.1	---	0.21	---	nC
Q _{gs}	Gate-Source Charge ^{2, 3}		---	0.19	---	
Q _{gd}	Gate-Drain Charge ^{2, 3}		---	0.82	---	
T _{d(on)}	Turn-On Delay Time ^{2, 3}	V _{DD} =120V , V _{GS} =10V , R _G =6 Ω I _D =0.1A	---	3.6	---	ns
T _r	Rise Time ^{2, 3}		---	3.3	---	
T _{d(off)}	Turn-Off Delay Time ^{2, 3}		---	15	---	
T _f	Fall Time ^{2, 3}		---	64	---	
C _{iss}	Input Capacitance	V _{DS} =25V , V _{GS} =0V , F=1MHz	---	69	---	pF
C _{oss}	Output Capacitance		---	6.8	---	
C _{rss}	Reverse Transfer Capacitance		---	4.1	---	

Drain-Source Diode Characteristics and Maximum Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I _S	Continuous Source Current	V _G =V _D =0V , Force Current	---	---	0.25	A
I _{SM}	Pulsed Source Current		---	---	0.50	A
V _{SD}	Diode Forward Voltage	V _{GS} =0V , I _S =0.1A , T _J =25°C	---	---	1.2	V

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.
3. Essentially independent of operating temperature.

Figure 1. Output Characteristics

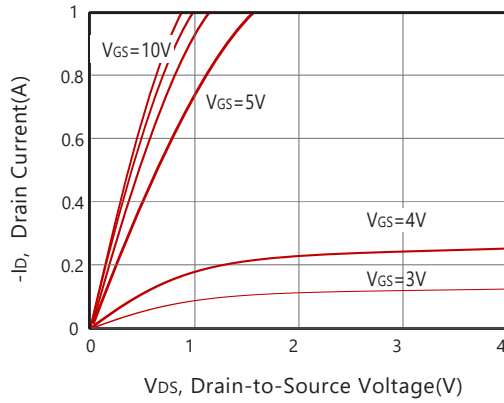


Figure 2. Body Diode Forward Voltage Variation with Source Current

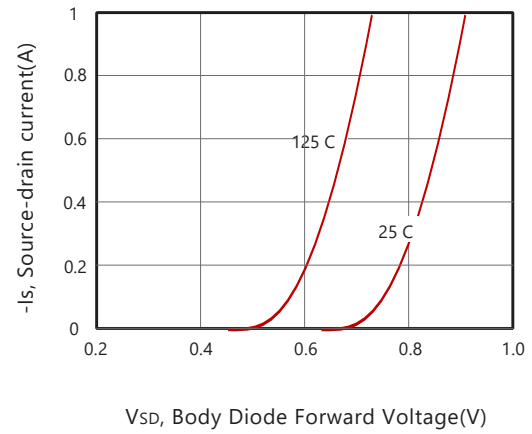


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

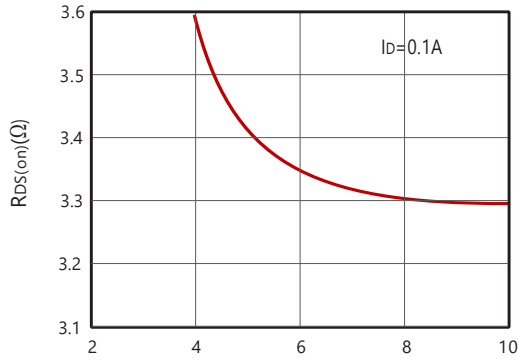


Figure 4. On-Resistance Variation with Drain Current and Temperature

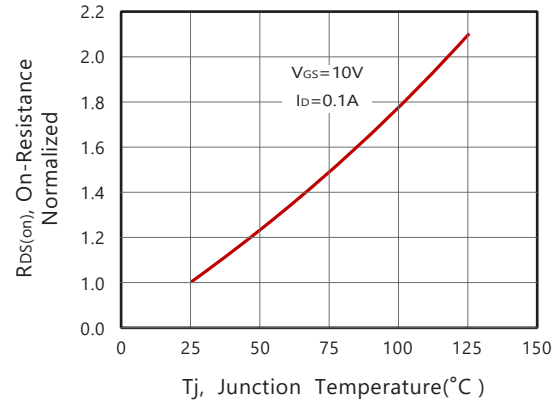


Figure 5. Gate Threshold Variation with Temperature

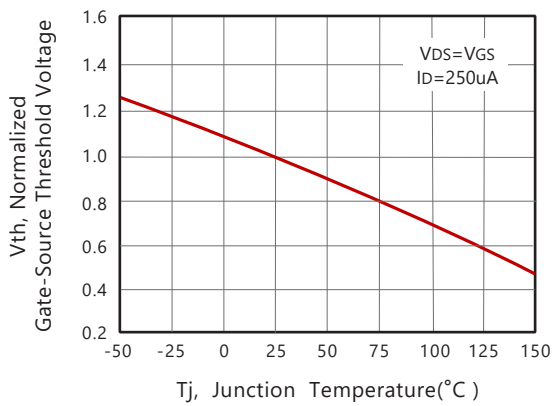


Figure 6. Gate Charge

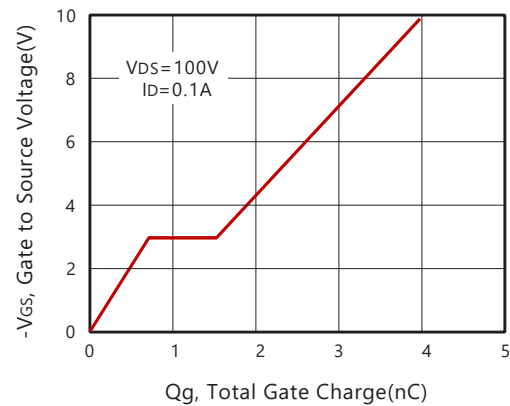


Figure 7. Capacitance

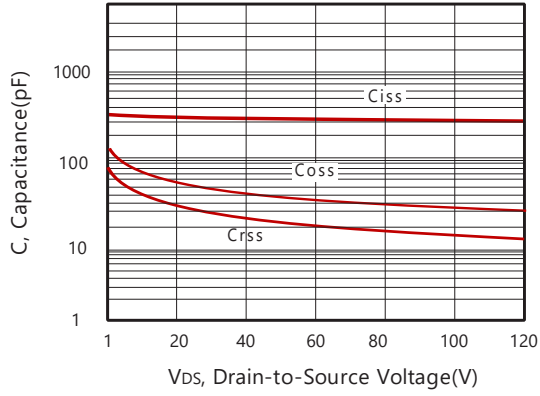


Figure 8. Maximum Safe Operating Area

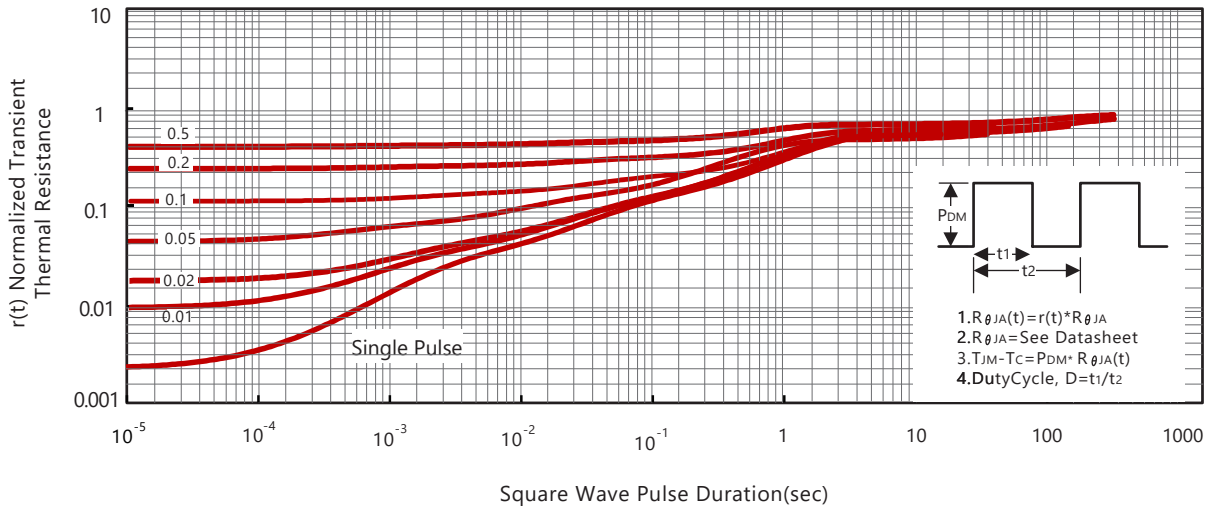
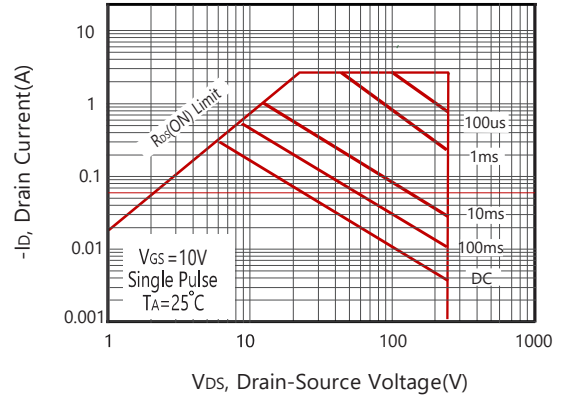
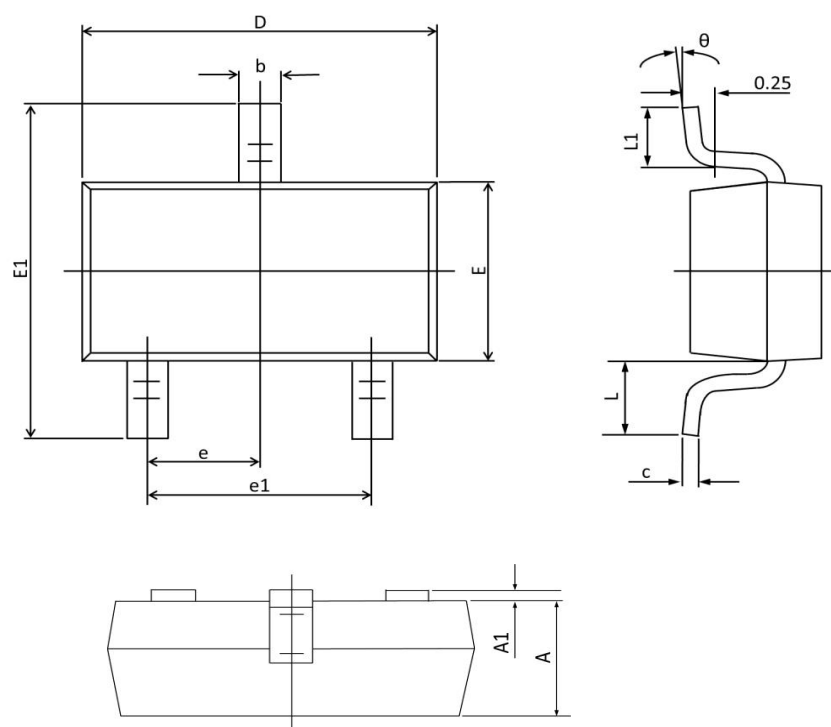


Figure 9. Normalized Thermal Transient Impedance Curve

SOT-23 PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max		Min
A	0.900	1.110	A	0.900
A1	0.001	0.100	A1	0.001
b	0.300	0.500	b	0.300
c	0.080	0.180	c	0.080
D	2.800	3.040	D	2.800
E	1.200	1.400	E	1.200
E1	2.100	2.640	E1	2.100
e	0.950 TYP.		0.037 TYP.	
e1	1.780	2.040	e1	1.780
L	0.550 REF.		0.022 REF.	
L1	0.100	0.500	L1	0.100
θ	1°	10°	θ	1°

REEL SPECIFICATION

P/N	PKG	QTY
2N7002E-T1-E3-MS	SOT-23	3000

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