TM01EP02I5

P-Channel Enhancement Mosfet

General Description

- Low $R_{DS(ON)}$
- RoHS and Halogen-Free Compliant

Applications

- Load switch
- PWM

General Features

V_{DS} =-20V I_D =-1A

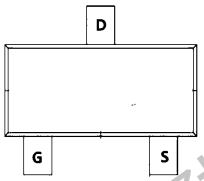
$R_{DS(ON)}$=280mΩ(typ.)@V_{GS}=-4.5V

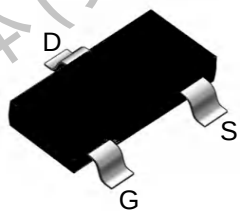
ESD protection

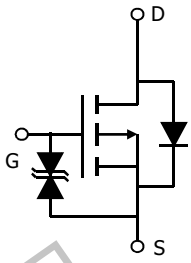
100% UIS Tested

100% R_g Tested

I5:SOT-523







Marking: 39K OR 3139A

Absolute Maximum Ratings (T_C=25℃unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-20	V
V_{GS}	Gate-Source Voltage	±12	V
I_D@T_A=25°C	Continuous Drain Current, V_{GS} @ 10V	-1	A
I_D@T_A=70°C	Continuous Drain Current, V_{GS} @ 10V	-0.5	A
I_{DM}	Pulsed Drain Current	-4	A
P_D@T_A=25°C	Total Power Dissipation	0.3	W
T_{STG}	Storage Temperature Range	-55 to 175	°C
T_J	Operating Junction Temperature Range	-55 to 175	°C

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient	---	178	°C/W
R	Thermal Resistance Junction Case	---	---	°C/W

TM01EP02I5

P-Channel Enhancement Mosfet

Electrical Characteristics (T_J=25℃ unless otherwise noted)

Static Parameter Parameter	Symbol	Conditions	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}= 0V, I_D=-250μA	-20			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-20V,V_{GS}=0V,T_C=25℃			-1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}= ±10V, V_{DS}=0V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}= V_{GS}, I_D=-250μA	-0.4	-0.65	-1.0	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}= -4.5V, I_D=-1A		280	320	mΩ
		V_{GS}= -2.5V, I_D=-0.5A		360	460	
		V_{GS}= -1.8V, I_D=-0.3A		---	---	
Diode Forward Voltage	V_{SD}	I_S=-2A,V_{GS}=0V		-0.8	-1.2	V
Maximum Body-Diode Continuous Current	I_S				-1	A
Dynamic Parameters						
Input Capacitance	C_{iss}	V_{DS}=-10V,V_{GS}=0V,f=1MHZ		127		pF
Output Capacitance	C_{oss}			23		
Reverse Transfer Capacitance	C_{rss}			15		
Switching Parameters						
Total Gate Charge	Q_g	V_{GS}=-4.5V,V_{DS}=-10V,I_D=-2A		4.5		nC
Gate Source Charge	Q_{gs}			0.85		
Gate Drain Charge	Q_{gd}			1.4		
Reverse Recovery Charge	Q_{rr}	I_F=-2A, di/dt=100A/us		2.3		
Reverse Recovery Time	t_{rr}			27		ns
Turn-on Delay Time	$t_{D(on)}$	V_{GS}=-4.5V,V_{DD}=-10V, I_D=-1A, R_{GEN}=2.5Ω		6		
Turn-on Rise Time	t_r			30		
Turn-off Delay Time	$t_{D(off)}$			45		
Turn-off Fall Time	t_f			46		

Typical Performance Characteristics

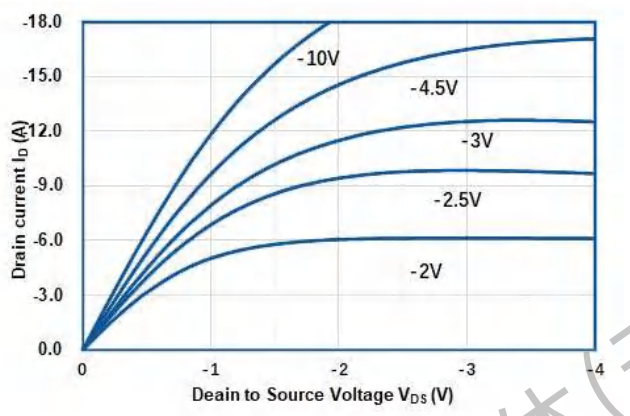


Figure1. Output Characteristics

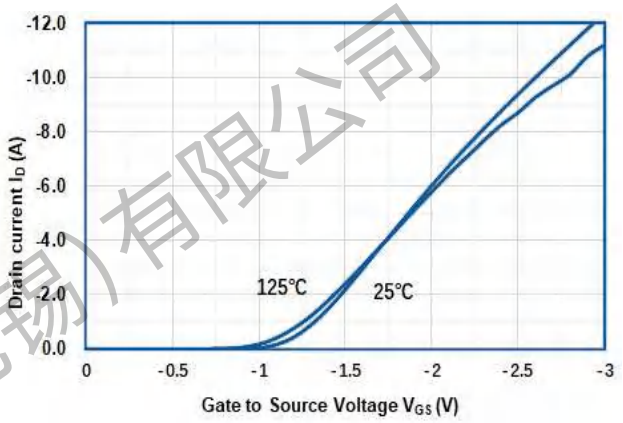


Figure2. Transfer Characteristics

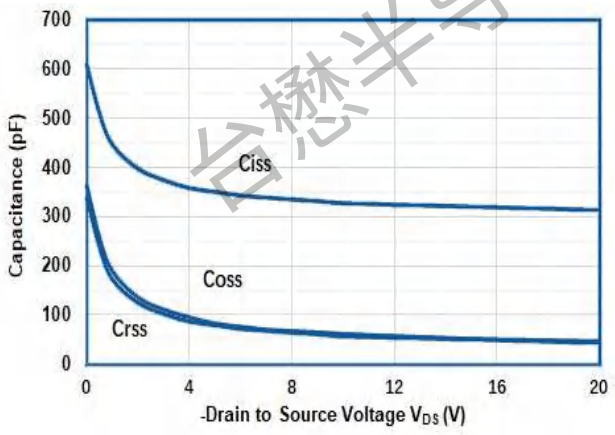


Figure3. Capacitance Characteristics

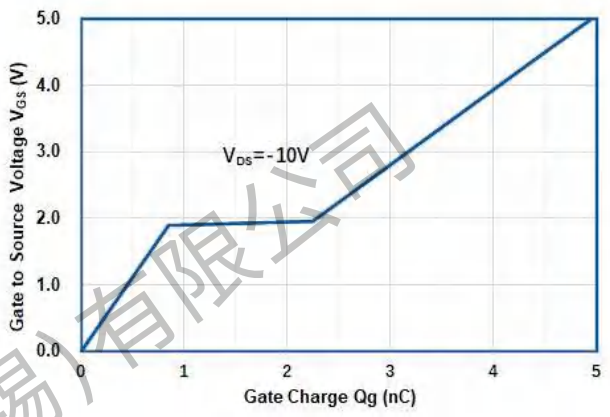


Figure4. Gate Charge

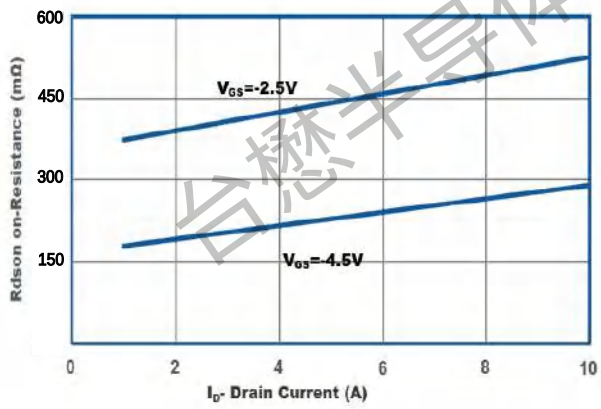


Figure5. Drain-Source on Resistance

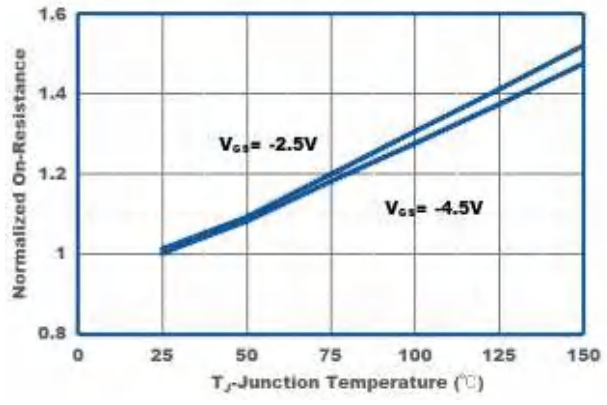


Figure6. Drain-Source on Resistance

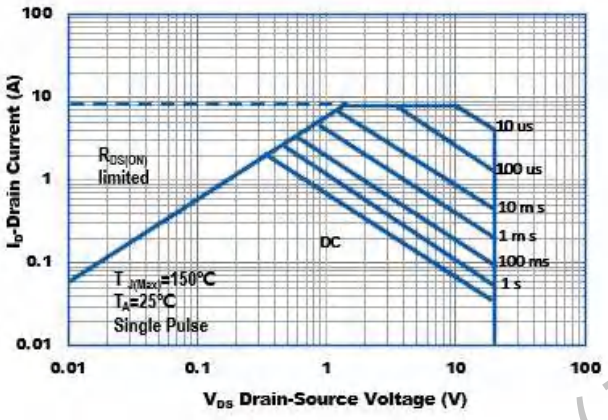


Figure7. Safe Operation Area

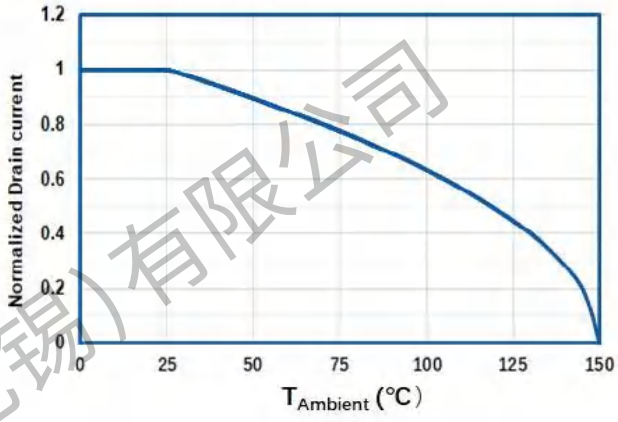


Figure8. Drain Current vs Ambient temperature

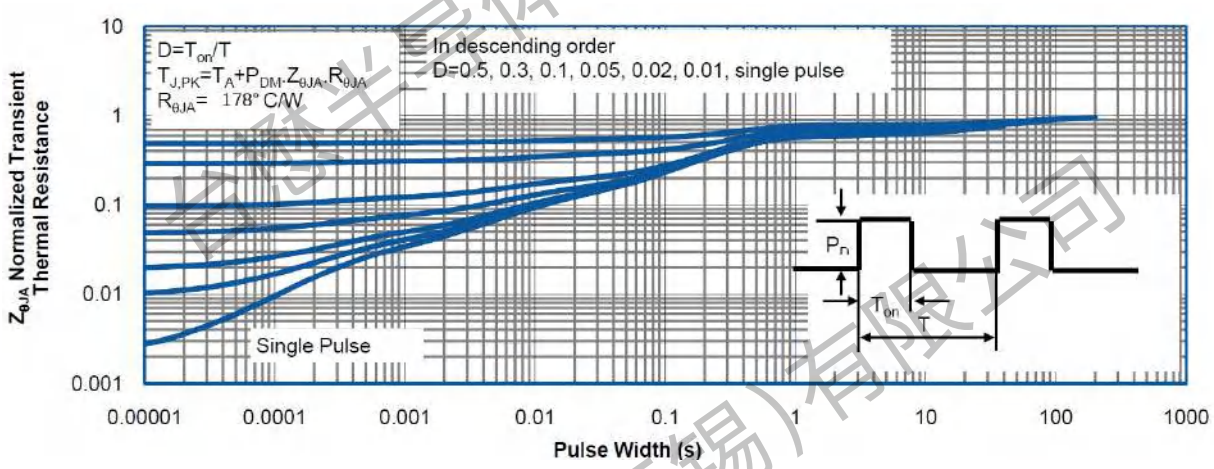
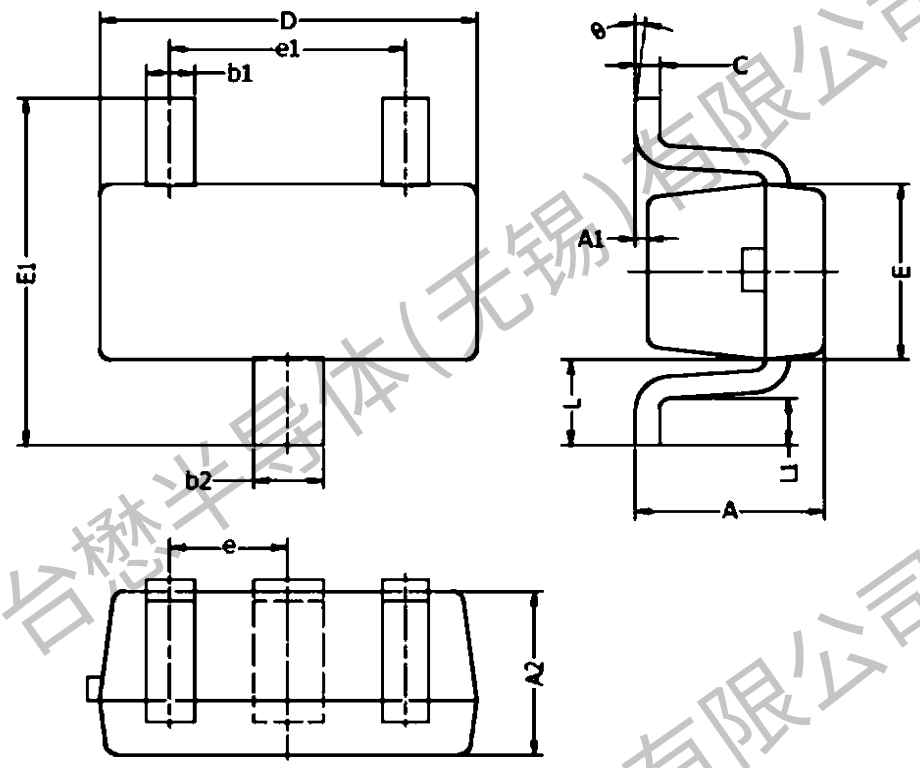


Figure9. Normalized Maximum Transient Thermal Impedance

Package Mechanical Data:SOT-523



DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.70	0.90	0.028	0.035
A1	0.00	0.10	0.000	0.004
A2	0.70	0.80	0.028	0.031
b1	0.15	0.25	0.006	0.010
b2	0.25	0.35	0.010	0.014
c	0.10	0.20	0.004	0.008
D	1.50	1.70	0.059	0.067
E	0.70	0.90	0.028	0.035
E1	1.45	1.75	0.057	0.069
e	0.50 TYP.		0.020 TYP.	
e1	0.90	1.10	0.035	0.043
L	0.40 REF.		0.016 REF.	
L1	0.10	0.30	0.004	0.012
θ	0°	8°	0°	8°

NOTES:
1. Above package outline conforms to JEITA EAIJ ED-7500A SC-75A.
2. Dimensions are exclusive of Burrs, Mold Flash & Tie Bar extrusions.

Important Notices and Disclaimers

- Tritech-MOS Technology Corp.reserves the right to change thisdocument, its products, and specifications at any time without prior notice.
- Before final design, purchase, or use, customers should obtain and confirm the latest product information and specifications.
- Tritech-MOS Technology Corp. makes no warranties, representations or warranties regarding the suitability of its products for any specific purpose, and Tritech-MOS Technology Corp. does not assume any responsibility for application assistance or customer product design.
- Tritech-MOS Technology Corp. does not guarantee or assume any responsibility for the purchase or use of any unexpected or unauthorized products.
- Any intellectual property rights of Tritech-MOS Technology Corp. are not licensed through implicate or other means.
- Products of Tritech-MOS Technology Corp. are not included as critical components in life support equipment or systems without explicit written approval from Tritech-MOS Technology Corp.

Revision history:

Date	Rev	Description	Page
2023.06.21	23.06	Original	