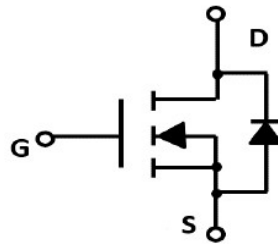
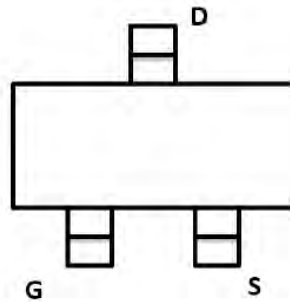


N-Channel Enhancement Mode Field Effect Transistor



Top View

SOT-23



Product Summary

- V_{DS} 40V
- I_D 5.0A
- $R_{DS(ON)}$ (at $V_{GS}=10V$) < 45mohm
- $R_{DS(ON)}$ (at $V_{GS}=4.5V$) < 60mohm
- 100% V_{DS} Tested

General Description

- Trench Power LV MOSFET technology
- High Power and current handing capability
- AEC-Q101 qualified

Applications

- PWM application
- Load switch

■ Absolute Maximum Ratings ($T_A=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-source Voltage	V_{DS}	40	V
Gate-source Voltage	V_{GS}	± 20	V
Drain Current	I_D	$T_A=25^\circ\text{C}$	5
		$T_A=70^\circ\text{C}$	4
Pulsed Drain Current ^A	I_{DM}	20	A
Total Power Dissipation	P_D	$T_A=25^\circ\text{C}$	1.2
		$T_A=70^\circ\text{C}$	0.8
Thermal Resistance Junction-to-Ambient ^B	$R_{\theta JA}$	104	$^\circ\text{C}/\text{W}$
Junction and Storage Temperature Range	T_J, T_{STG}	-55 ~ +150	$^\circ\text{C}$

■ Ordering Information (Example)

PREFERRED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
FTK05N04A	F2	4005.	3000	30000	120000	7" reel



FTK05N04A

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

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Parameter						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250μA	40			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =40V, V _{GS} =0V			1	μA
Gate-Body Leakage Current	I _{GSS1}	V _{GS} =± 20V, V _{DS} =0V			± 100	nA
	I _{GSS2}	V _{GS} =± 10V, V _{DS} =0V			± 50	
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D =250μA	1.0	1.5	2.5	V
Static Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =10V, I _D =5A		30	45	mΩ
		V _{GS} =4.5V, I _D =3A		40	60	
Diode Forward Voltage	V _{SD}	I _S =5A, V _{GS} =0V			1.2	V
Dynamic Parameters						
Input Capacitance	C _{ISS}	V _{DS} =10V, V _{GS} =0V, f=1MHZ		417		pF
Output Capacitance	C _{OSS}			73		
Reverse Transfer Capacitance	C _{rss}			59		
Switching Parameters						
Total Gate Charge	Q _g	V _{GS} =10V, V _{DS} =20V, I _D =3.5A		9.76		nC
Gate-Source Charge	Q _{gs}			1.85		
Gate-Drain Charge	Q _{gd}			2.14		
Reverse Recovery Charge	Q _{rr}	I _F =3.5A, di/dt=100A/us		2.6		
Reverse Recovery Time	t _{rr}			19.1		
Turn-on Delay Time	t _{D(on)}	V _{GS} =10V, V _{DS} =20V, I _D =3.5A R _{GEN} =3Ω		4.4		ns
Turn-on Rise Time	t _r			21		
Turn-off Delay Time	t _{D(off)}			12		
Turn-off fall Time	t _f			19.6		

A. Pulse Test: Pulse Width≤300us, Duty cycle ≤2%.

B. R_{θJA} is the sum of the junction-to-case and case-to-ambient thermal resistance, where the case thermal reference is defined as the solder mounting surface of the drain pins. R_{θJC} is guaranteed by design, while R_{θJA} is determined by the board design. The maximum rating presented here is based on mounting on a 1 in 2 pad of 2oz copper.

Typical Performance Characteristics

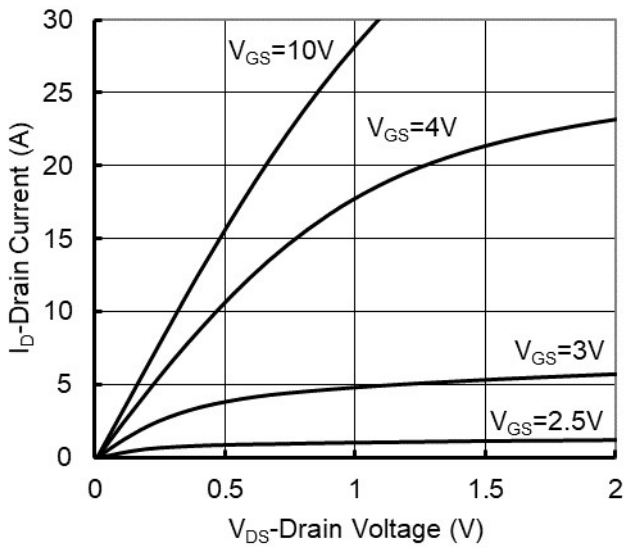


Figure 1. Output Characteristics

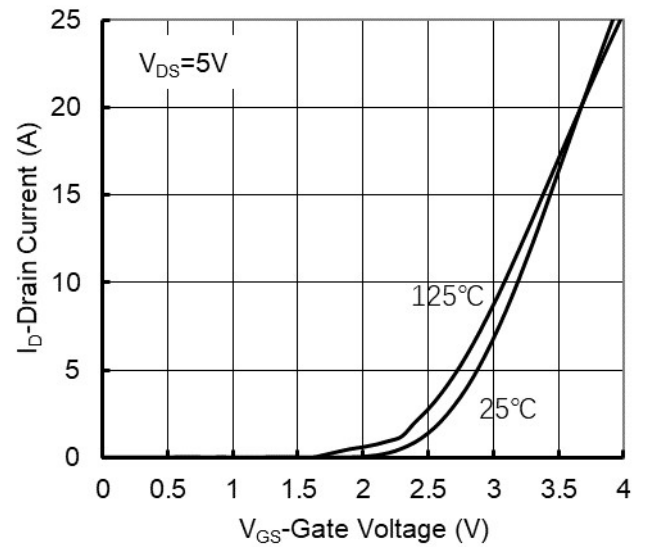


Figure 2. Transfer Characteristics

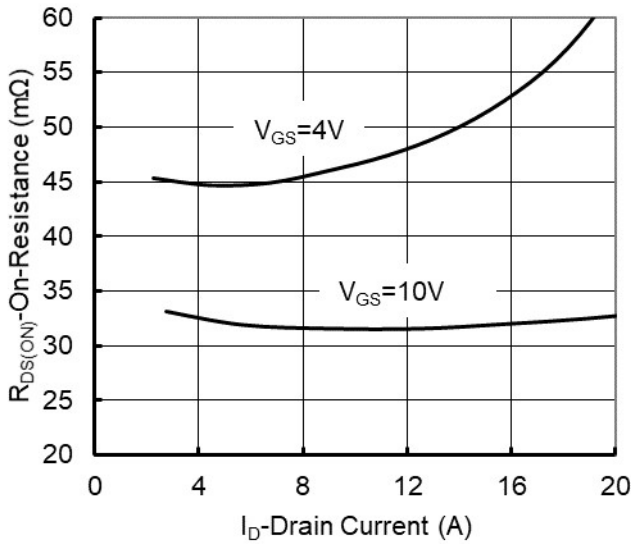


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

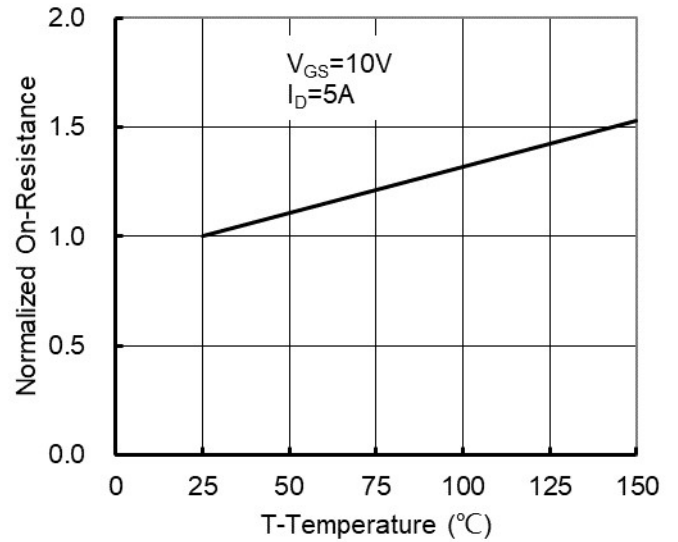


Figure 4: On-Resistance vs. Junction Temperature

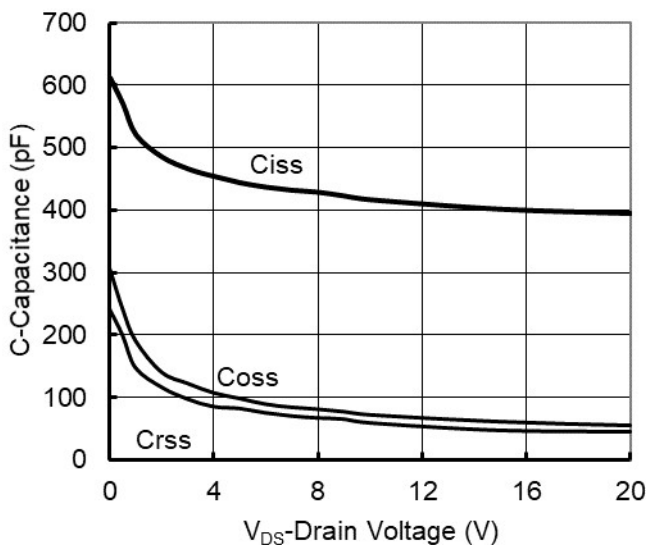


Figure 5. Capacitance Characteristics

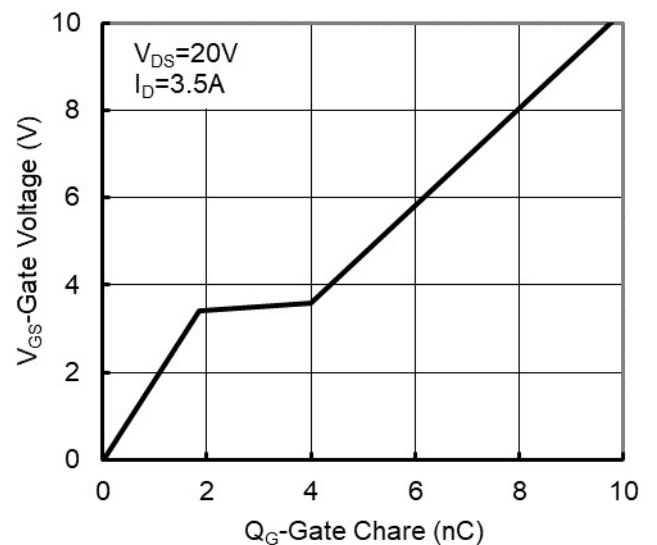


Figure 6. Gate Charge

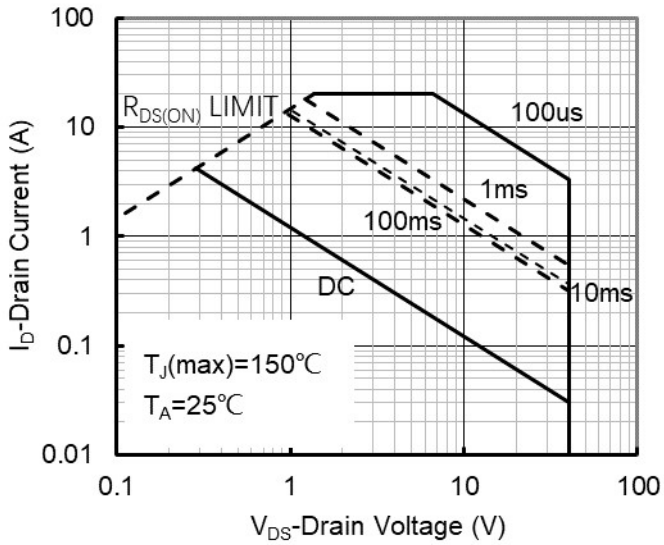


Figure 7. Safe Operation Area

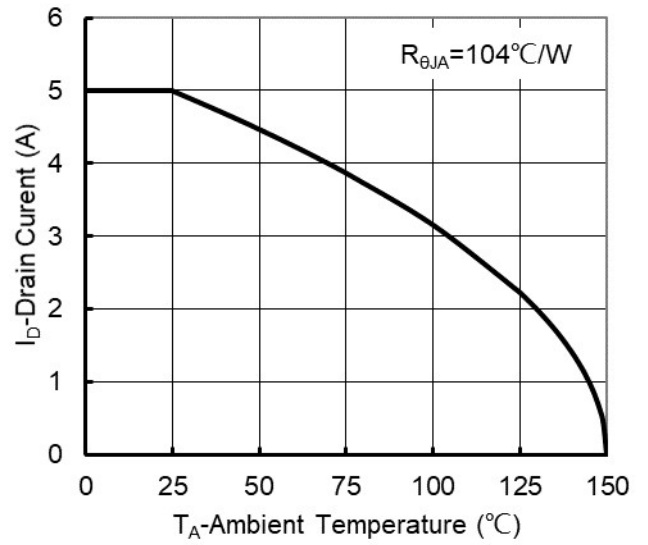


Figure 8. Maximum Continuous Drain Current vs Ambient Temperature

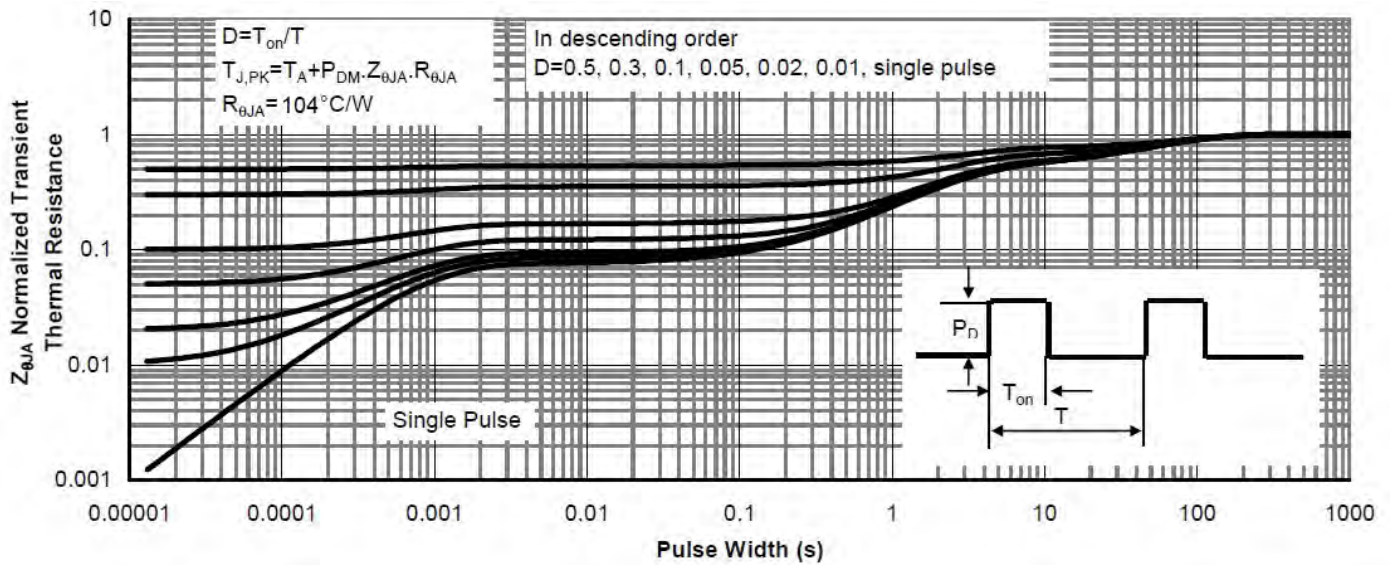
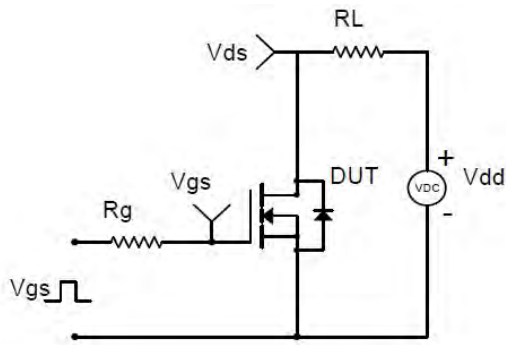
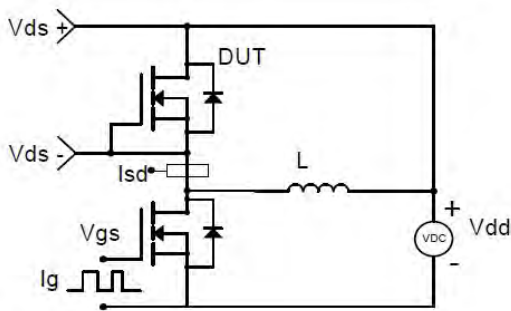


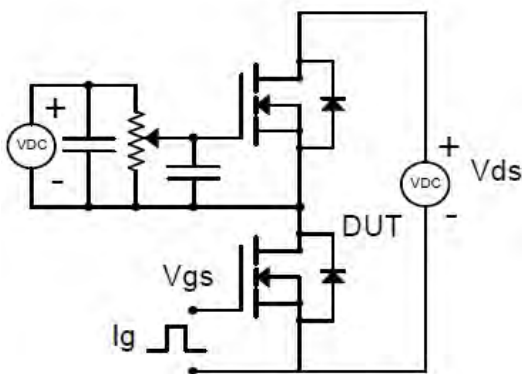
Figure 9. Normalized Maximum Transient Thermal Impedance



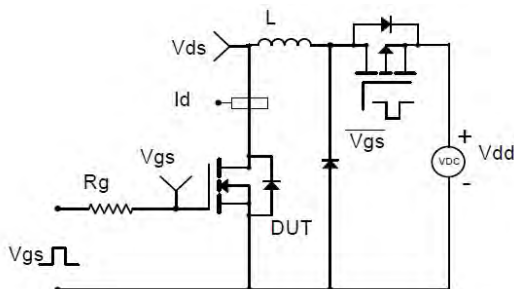
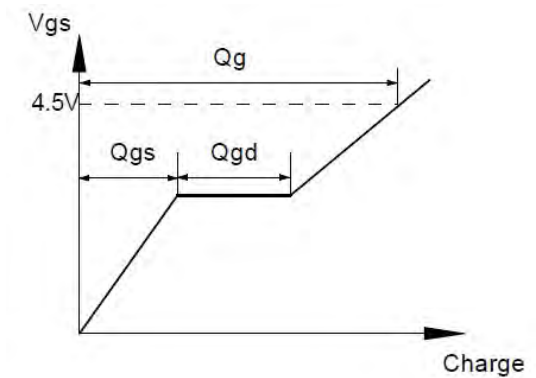
Resistive Switching Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms

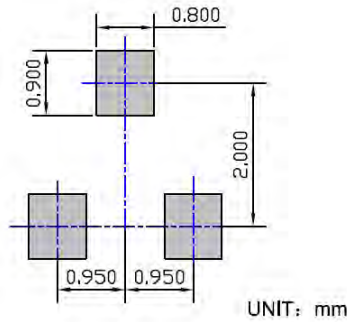
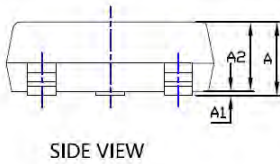
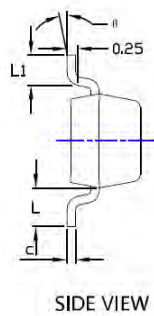
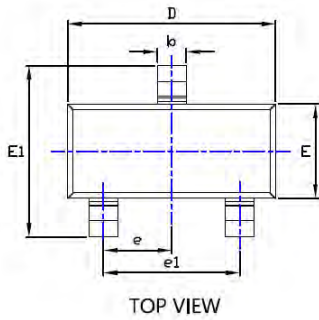


Gate Charge Test Circuit & Waveform



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

■ SOT-23 Package information



SYMBOL	DIMENSIONS					
	INCHES			Millimeter		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	0.035	---	0.045	0.900	---	1.150
A1	0.000	---	0.004	0.000	---	0.100
A2	0.035	0.038	0.041	0.900	0.975	1.050
b	0.012	0.016	0.020	0.300	0.400	0.500
c	0.004	---	0.008	0.100	---	0.200
D	0.110	0.114	0.118	2.800	2.900	3.000
E	0.047	0.051	0.055	1.200	1.300	1.400
E1	0.089	0.094	0.100	2.250	2.400	2.550
e	0.037TYP			0.950TYP		
e1	0.071	0.075	0.079	1.800	1.900	2.000
L	0.022REF			0.550REF		
L1	0.012	0.016	0.200	0.300	0.400	0.500
⌀	0*	---	8*	0*	---	8*

- NOTE:
- 1.PACKAGE BODY SIZES EXCLUDE MOLD FLASH AND GATE BURRS.
 - 2.TOLERANCE 0.1mm UNLESS OTHERWISE SPECIFIED.
 - 3.THE PAD LAYOUT IS FOR REFERENCE PURPOSES ONLY.