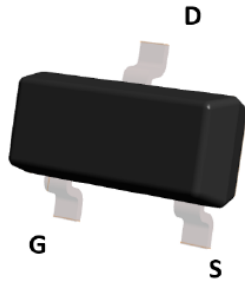
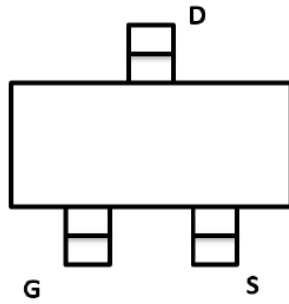


N-Channel Enhancement Mode Field Effect Transistor



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 handling capability
Part no. with suffix "Q" means 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_{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
YJL05N04AQ	F2	4005.	3000	30000	120000	7" reel



YJL05N04AQ

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	m
		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} =3		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_{JA} 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_{JC} is guaranteed by design, while R_{JA} 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

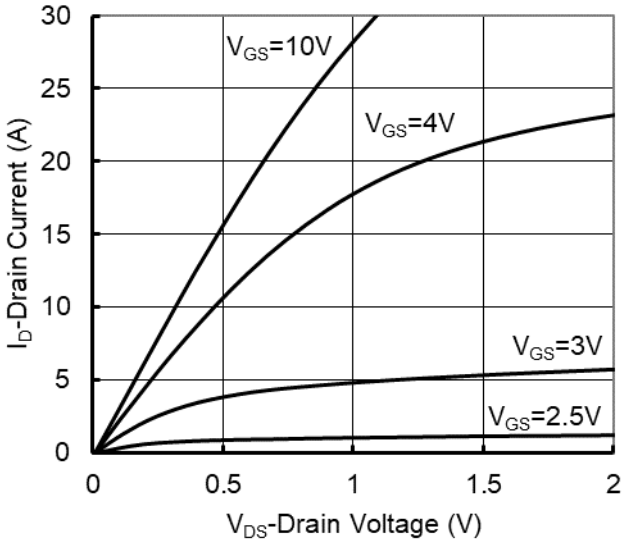


Figure1. Output Characteristics

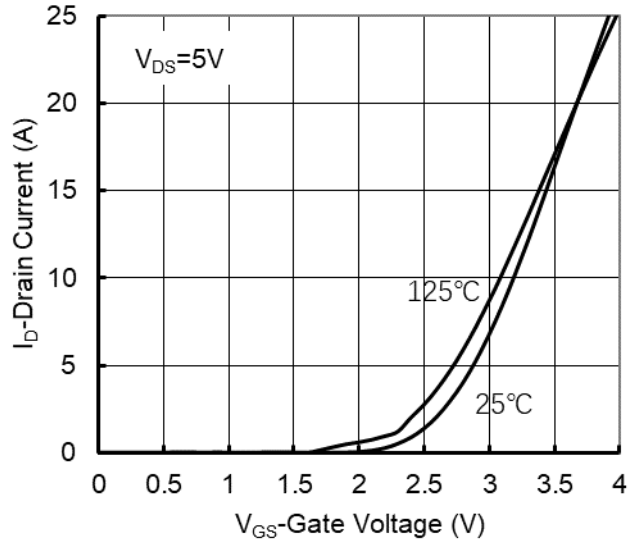


Figure2. Transfer Characteristics

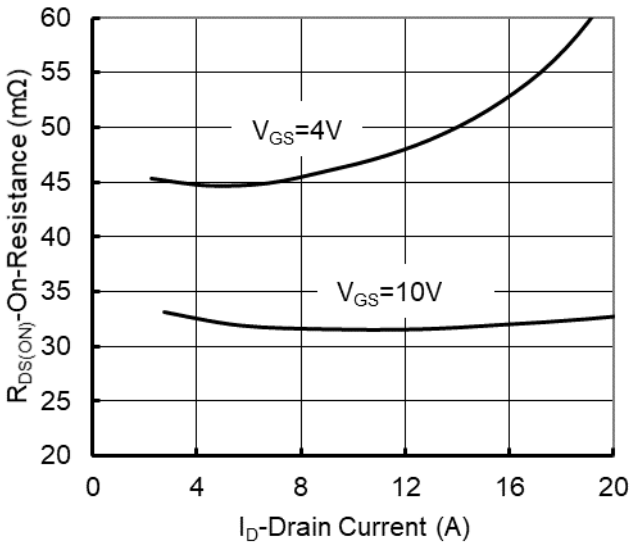


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

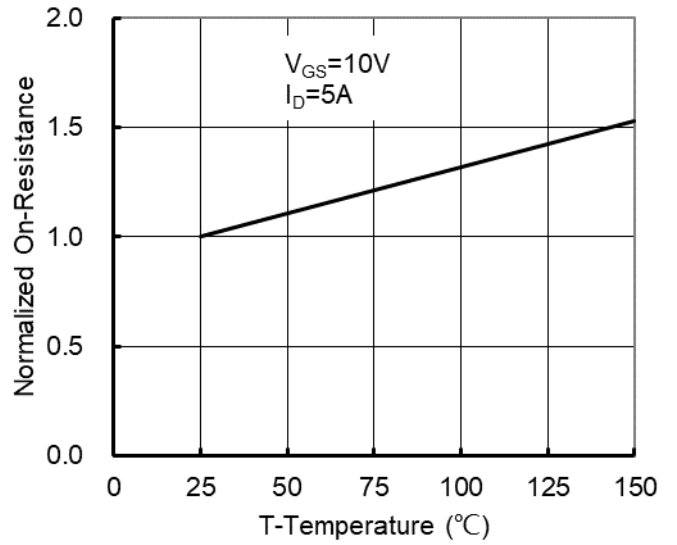


Figure 4: On-Resistance vs. Junction Temperature

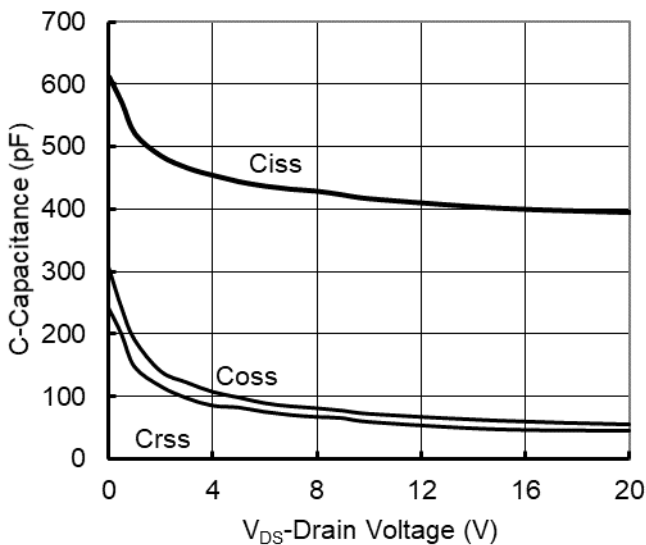


Figure5. Capacitance Characteristics

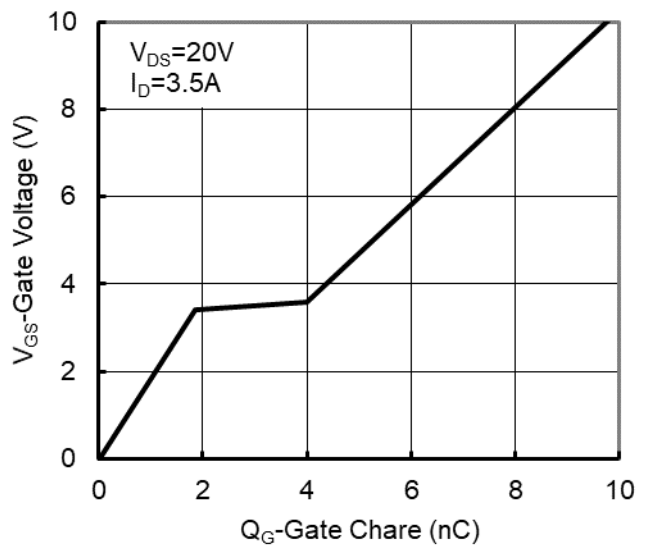


Figure6. Gate Charge



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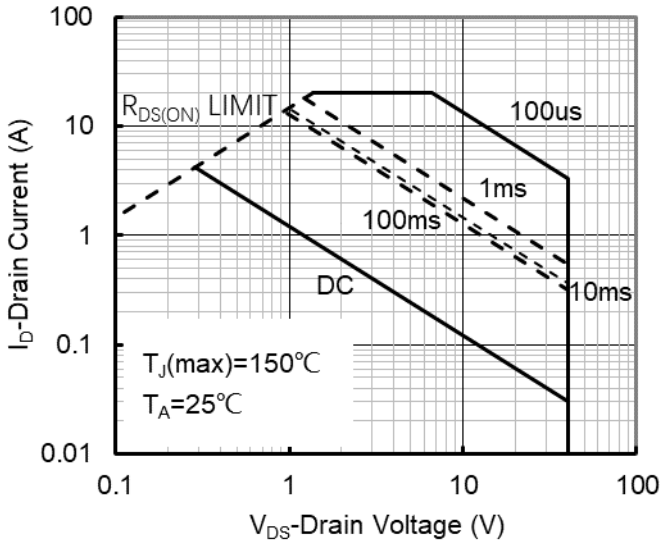


Figure7. Safe Operation Area

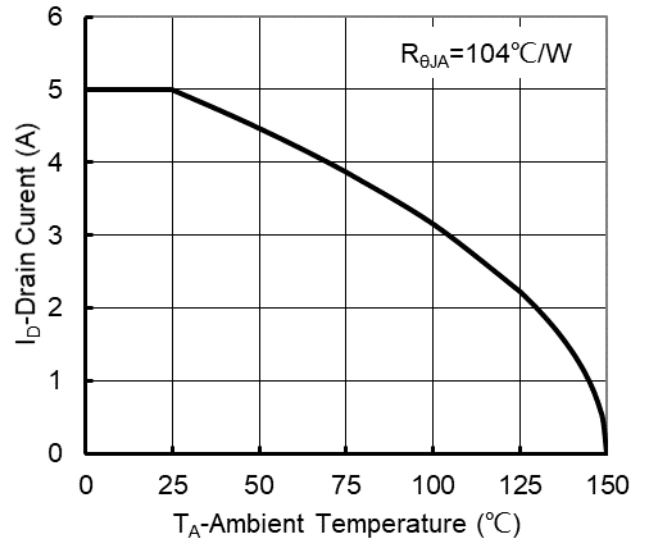


Figure8. Maximum Continuous Drain Current vs Ambient Temperature

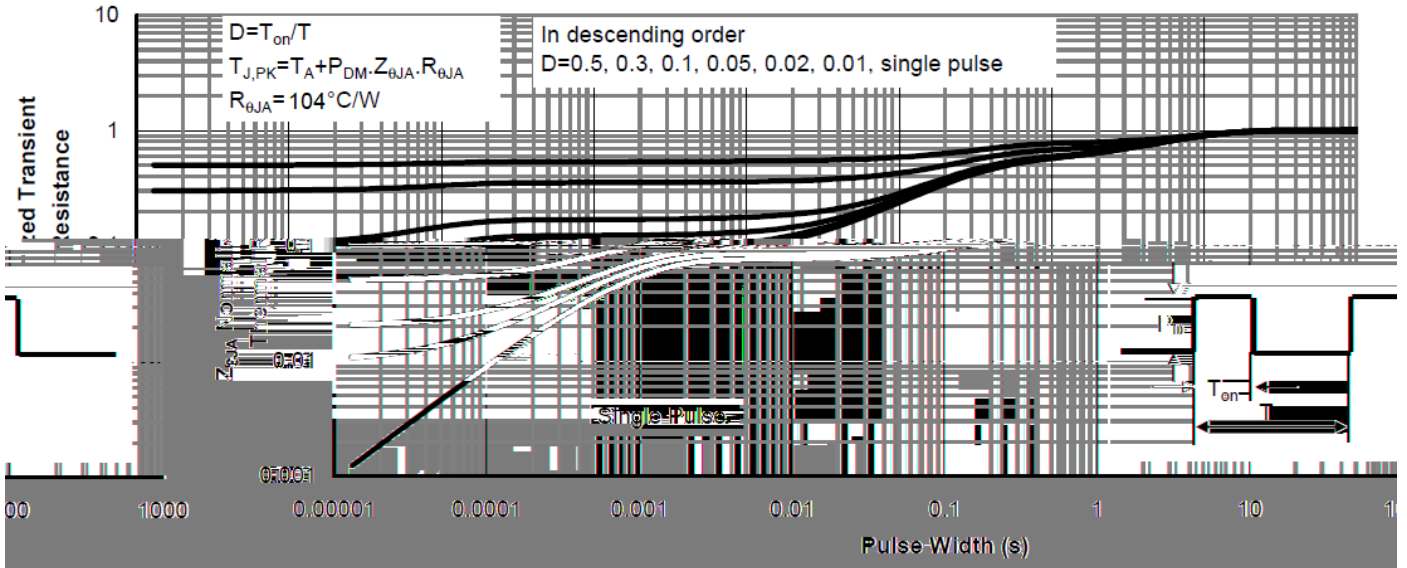
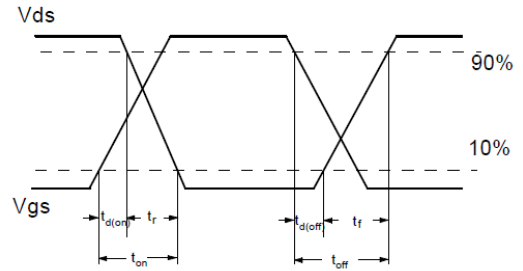
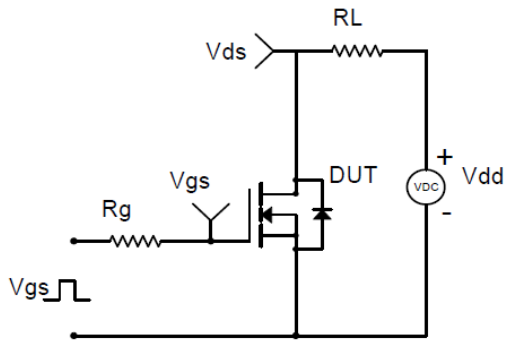
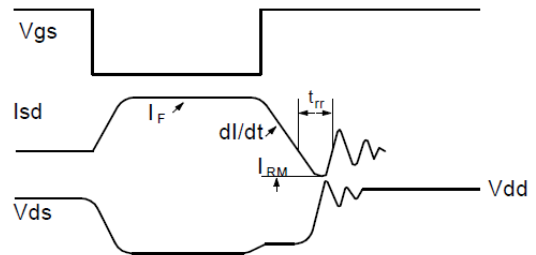
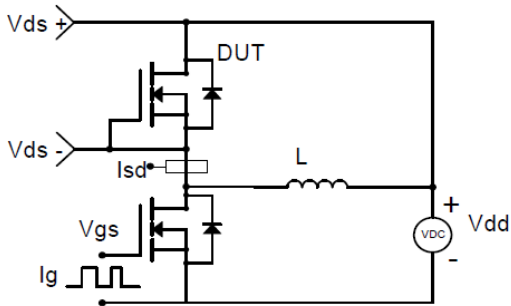


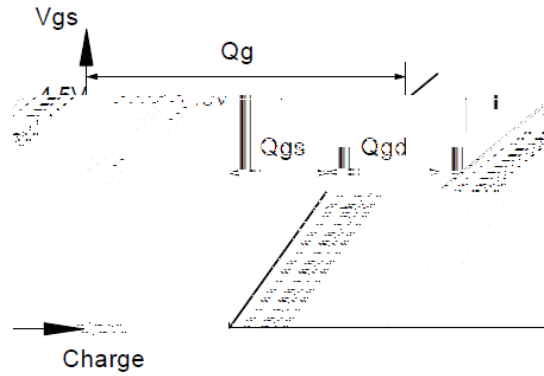
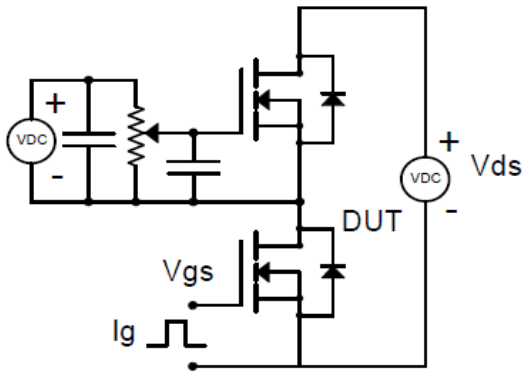
Figure9. Normalized Maximum Transient Thermal Impedance



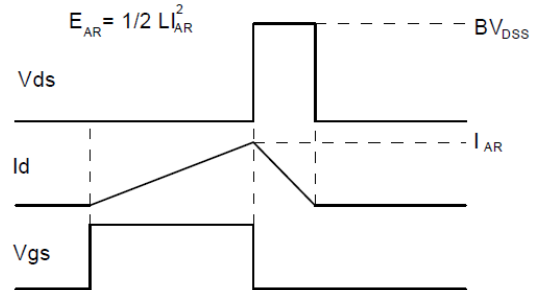
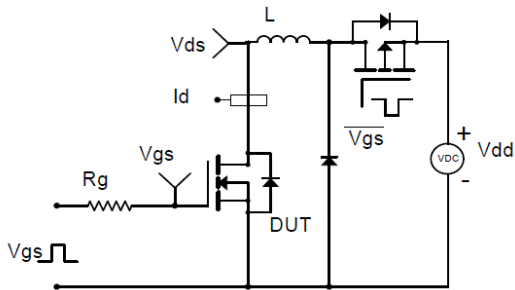
Resistive Switching Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Gate Charge Test Circuit & Waveform

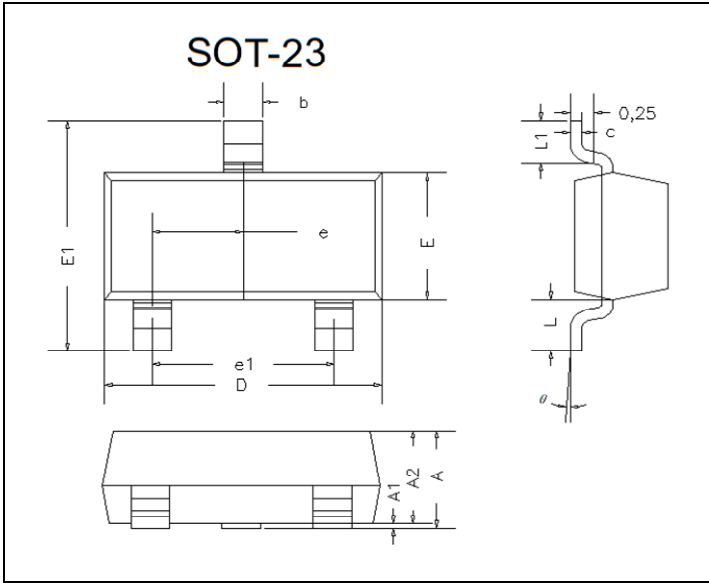


Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



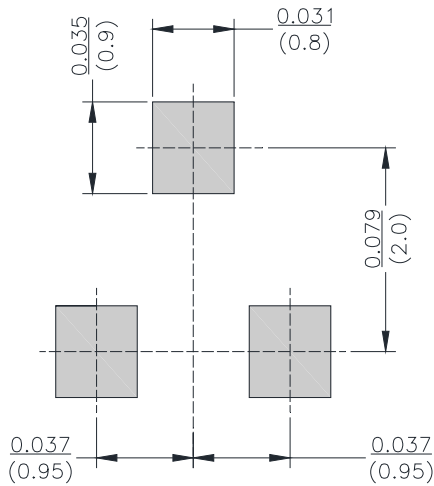
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SOT-23 Package information



DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	0.035	0.045	0.90	1.15	
A1	0.000	0.004	0.00	0.10	
A2	0.035	0.041	0.90	1.05	
b	0.012	0.020	0.30	0.50	
c	0.004	0.008	0.10	0.20	
D	0.110	0.118	2.80	3.00	
E	0.047	0.055	1.20	1.40	
E1	0.089	0.100	2.25	2.55	
e	0.370TYP		0.95TYP		
e1	0.071	0.079	1.80	2.00	
L	0.220REF		0.55REF		
L1	0.012	0.020	0.30	0.50	
	0°	8°	0°	8°	

SOT-23 Suggested Pad Layout





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