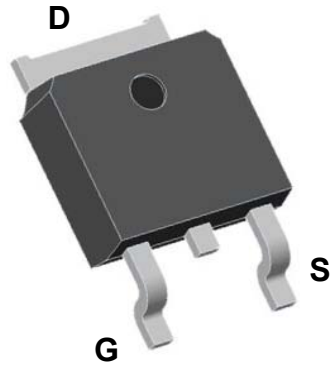
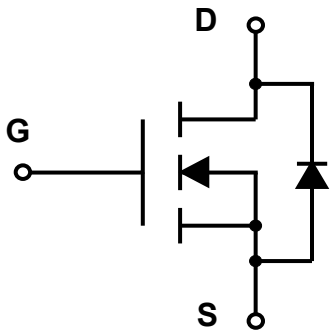
N-Channel Enhancement Mode Field Effect Transistor





TO-252

Product Summary

- Epoxy meets UL-94 V-0 flammability rating and halogen free
- Moisture Sensitivity Level 1
- V_{DS} 100V
- I_D 40A
- $R_{DS(ON)}$(at V_{GS}=10V) ＜20 mohm
- $R_{DS(ON)}$(at V_{GS}=4.5V) ＜26 mohm
- 100% UIS Tested
- 100% ▽VDS Tested
- Part no. with suffix “Q” means AEC-Q101 qualified

General Description

- Low $R_{DS(on)}$ & FOM
- Extremely low switching loss
- Excellent stability and uniformity
- Fast switching and soft recovery

Applications

- Consumer electronic power supply
- Motor control
- Synchronous-rectification
- Isolated DC/DC convertor
- Invertors

■ Absolute Maximum Ratings (T_A=25℃ unless otherwise noted)

Parameter		Symbol	Limit	Unit
Drain-source Voltage		V_{DS}	100	V
Gate-source Voltage		V_{GS}	±20	V
Drain Current [A]	T_C=25℃	I_D	40	A
Pulsed Drain Current [B]	T_C=25℃	I_{DM}	120	A
Avalanche energy [C]		EAS	30	mJ
Total Power Dissipation [D]	Tc=25℃	P_D	72	W
Thermal Resistance Junction-to-Case		$R_{\theta JC}$	1.74	℃/ W
Thermal Resistance Junction-to-Ambient [E]		$R_{\theta JA}$	62	℃/ W
Junction and Storage Temperature Range		T_J ,T_{STG}	-55～+150	℃

■ Ordering Information (Example)

PREFERED P/N	UNIT WEIGHT（g）	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
YJD40G10AQ	Approximate 0.32	YJD40G10A	2500	2500	25000	13“ reel

■ Electrical Characteristics (T_J=25℃ unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Parameter						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}= 0V, I_D=250μA	100			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=100V,V_{GS}=0V			1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}= ±20V, V_{DS}=0V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}= V_{GS}, I_D=250μA	1.0	1.8	2.5	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}= 10V, I_D=8A		17	20	mΩ
		V_{GS}= 4.5V, I_D=6A		20	26	
Diode Forward Voltage	V_{SD}	I_S=40A,V_{GS}=0V			1.3	V
Maximum Body-Diode Continuous Current	I_S				40	A
Dynamic Parameters						
Input Capacitance	C_{iss}	V_{DS}=50V,V_{GS}=0V,f=1MHZ		1190		pF
Output Capacitance	C_{oss}			195		
Reverse Transfer Capacitance	C_{rss}			4.1		
Switching Parameters						
Total Gate Charge	Q_g	V_{GS}=10V,V_{DS}=50V,I_D=8A		20		nC
Gate-Source Charge	Q_{gs}			2.4		
Gate-Drain Charge	Q_{gd}			5.3		
Reverse Recovery Chrage	Q_{rr}	I_F=8A, di/dt=100A/us		95		
Reverse Recovery Time	t_{rr}			50		ns
Turn-on Delay Time	$t_{D(on)}$	V_{GS}=10V, V_{DD}=50V,I_D=10A R_{GEN}=2.2Ω		17.5		
Turn-on Rise Time	t_r			3.9		
Turn-off Delay Time	$t_{D(off)}$			33.5		
Turn-off fall Time	t_f			3.2		

A. Calculated continuous current based on maximum allowable junction temperature.
B. Repetitive rating; pulse width limited by max. junction temperature.
C. V_{DD}=50 V, R_G=25 Ω, L=0.3 mH, starting T_J=25 ℃.
D. P_D is based on max. junction temperature, using junction-case thermal resistance.
E. The value of $R_{\theta JA}$ is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with T_A=25 ℃.

■ Typical Performance Characteristics

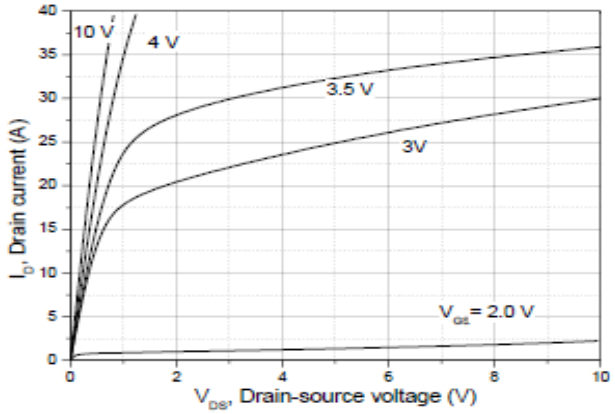


Figure1. Output Characteristics

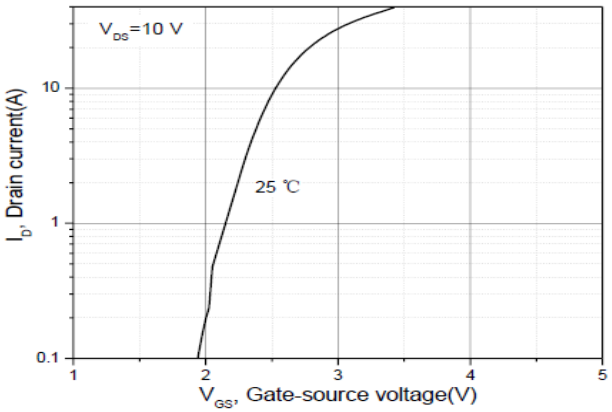


Figure2. Transfer Characteristics

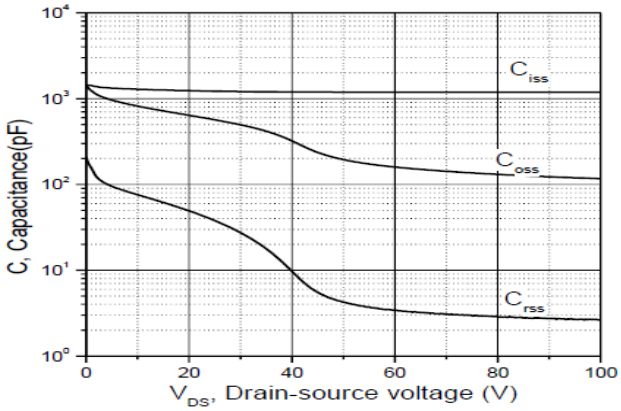


Figure3. Capacitance Characteristics

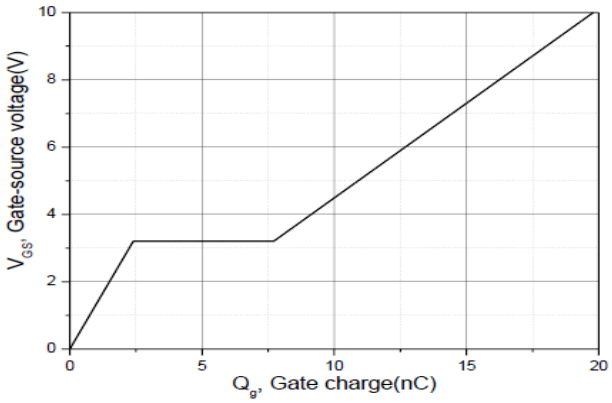


Figure4. Gate Charge

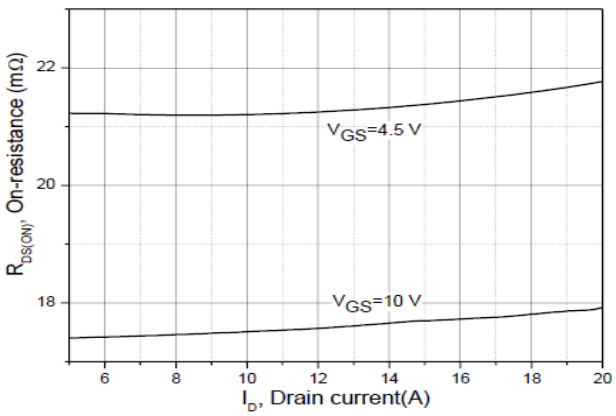


Figure5. Drain-Source on Resistance

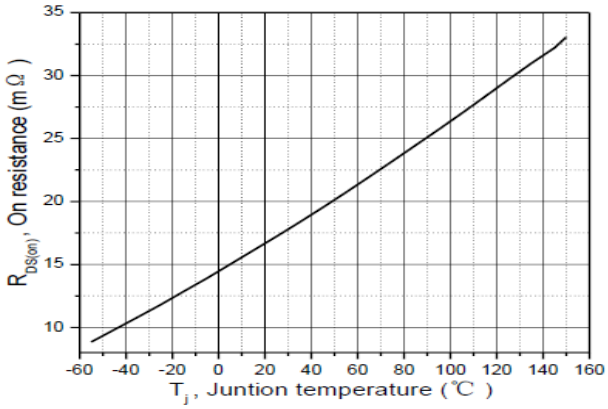


Figure6. Drain-Source on Resistance

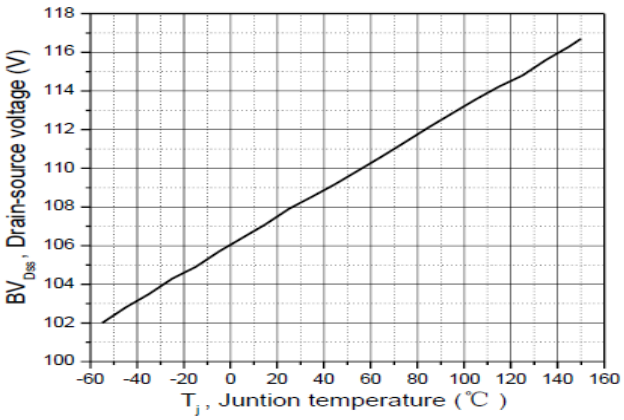


Figure7. Drain-source breakdown voltage

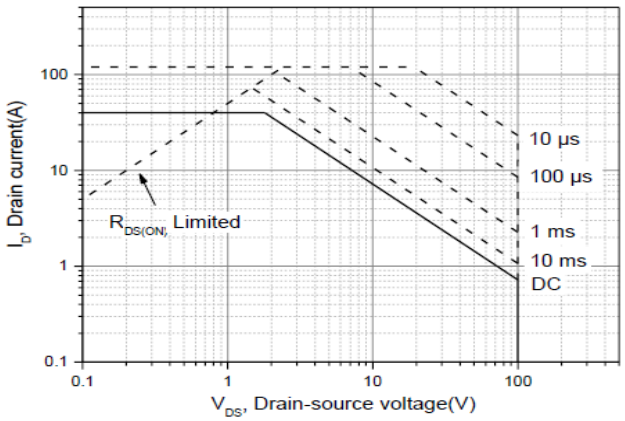
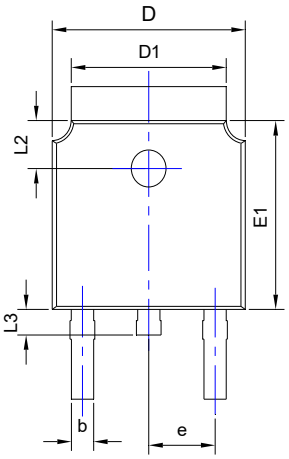
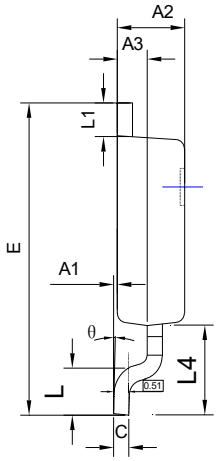


Figure8.Safe Operation Area

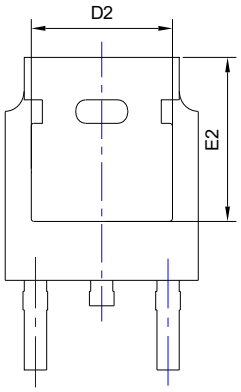
■ TO-252-B Package information



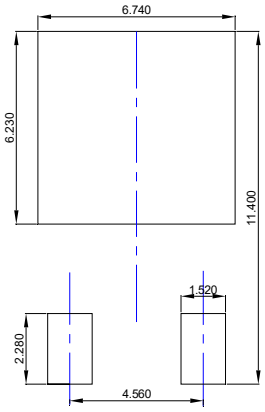
TOP VIEW



SIDE VIEW



BOTTOM VIEW



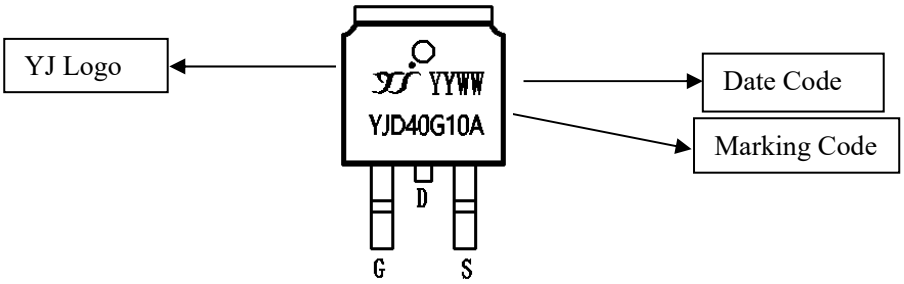
UNIT：mm

SUGGESTED SOLDER PAD LAYOUT

SYMBOL	DIMENSIONS					
	INCHES			Millimeter		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A1	0.000	---	0.008	0.000	---	0.200
A2	0.087	0.091	0.094	2.200	2.300	2.400
A3	0.035	0.039	0.043	0.900	1.000	1.100
b	0.026	0.030	0.034	0.660	0.760	0.860
c	0.018	0.020	0.023	0.460	0.520	0.580
D	0.256	0.260	0.264	6.500	6.600	6.700
D1	0.203	0.209	0.215	5.150	5.300	5.450
D2	0.181	0.189	0.195	4.600	4.800	4.950
E	0.390	0.398	0.406	9.900	10.100	10.300
E1	0.236	0.240	0.244	6.000	6.100	6.200
E2	0.203	0.209	0.215	5.150	5.300	5.450
e	0.090BSC			2.286BSC		
L	0.049	0.059	0.069	1.250	1.500	1.750
L1	0.035	---	0.050	0.900	---	1.270
L2	0.055	---	0.075	1.400	---	1.900
L3	0.024	0.031	0.039	0.600	0.800	1.000
L4	0.114REF			2.900REF		
θ	0°	---	10°	0°	---	10°

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.

■ Marking Information



Note：
1. All marking is at middle of the product body
2. All marking is in laser printing
3. YJD40G10A is Marking Code, YYWW is date code, “YY” is year, “WW” is week
4. Body color: Black

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