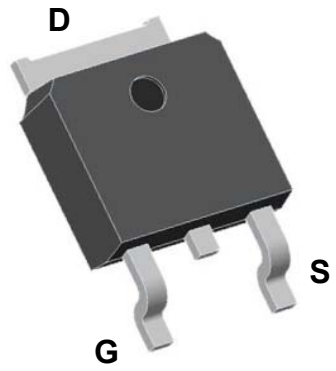
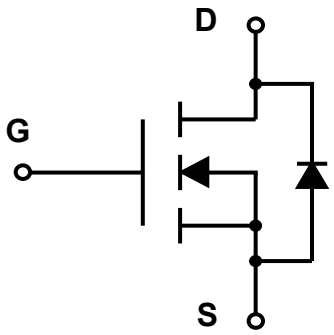
N-Channel Enhancement Mode Field Effect Transistor





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

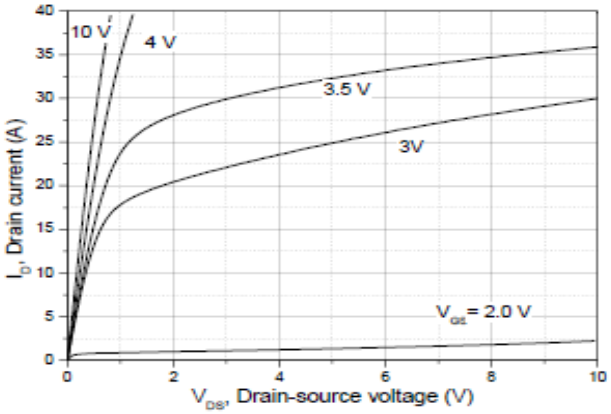


Figure1. Output Characteristics

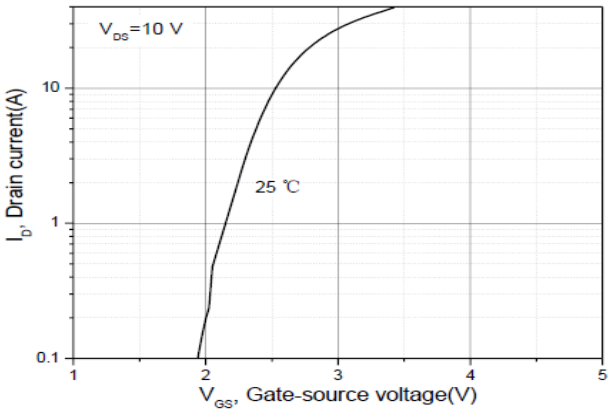


Figure2. Transfer Characteristics

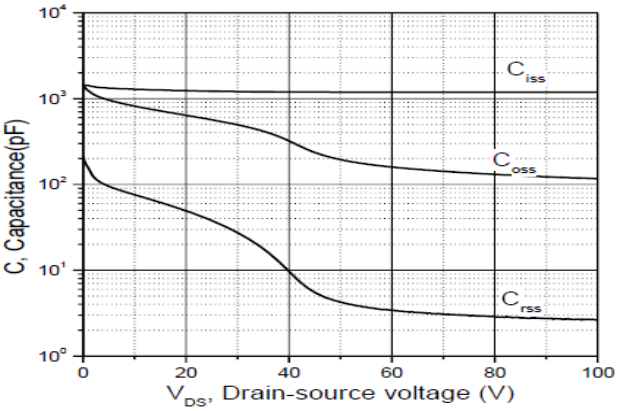


Figure3. Capacitance Characteristics

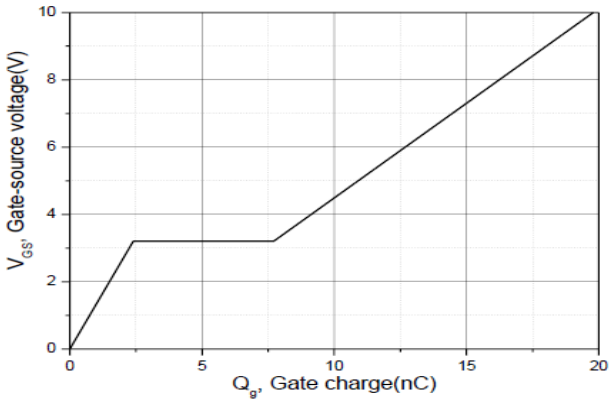


Figure4. Gate Charge

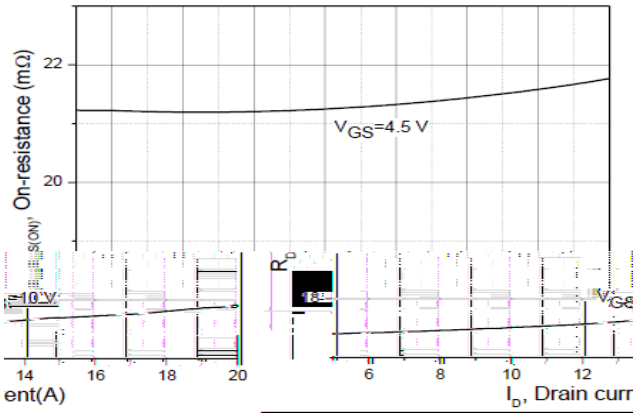


Figure5. Drain-Source on Resistance

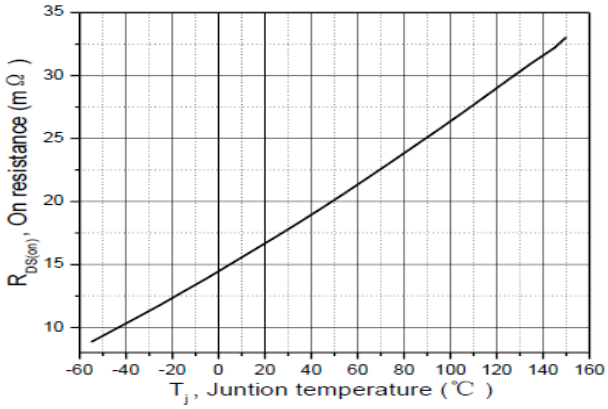


Figure6. Drain-Source on Resistance

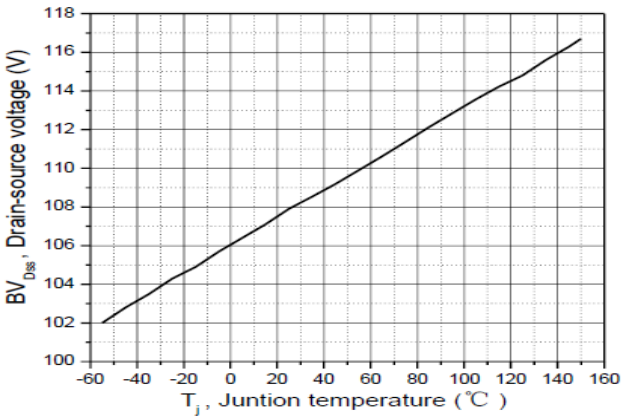


Figure7.

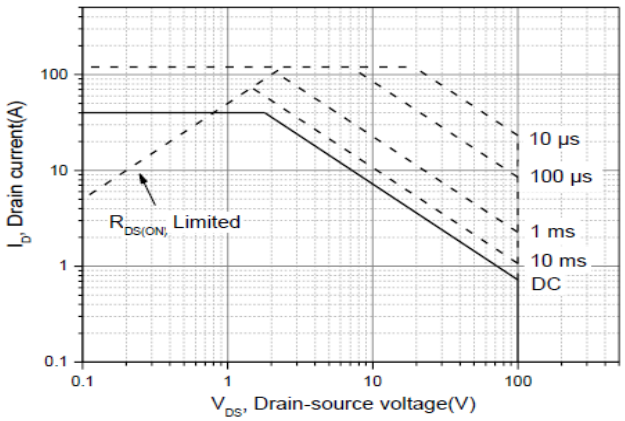


Figure8.Safe Operation Area

■ TO-252 Package information

	MIN	MAX	MIN	MAX
A	0.256	0.264	6.500	6.700
B	0.201	0.215	5.100	5.460
C	0.055	0.071	1.400	1.800
D	0.236	0.244	6.000	6.200
E	0.394	0.409	10.000	10.400
F	0.085	0.093	2.166	2.366
G	0.026	0.034	0.660	0.860

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