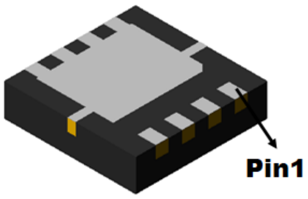
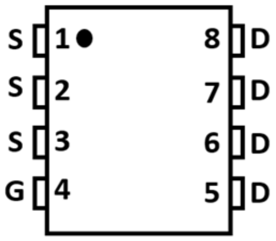
N-Channel Enhancement Mode Field Effect Transistor





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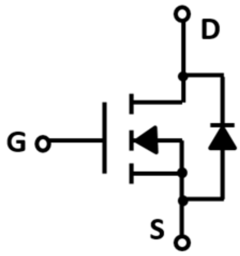


Product Summary

- V_{DS} 30 V
- I_D 60 A
- $R_{DS(ON)}$(at V_{GS}=10V) ＜3.2 mohm
- $R_{DS(ON)}$(at V_{GS}=4.5V) ＜4.0 mohm
- 100% UIS Tested
- 100% ▽VDS Tested

General Description

- Trench Power LV MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low $R_{DS(ON)}$

Applications

- DC-DC Converters
- Power management functions
- Backlighting

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

Parameter		Symbol	Limit	Unit
Drain-source Voltage		V_{DS}	30	V
Gate-source Voltage		V_{GS}	±20	V
Drain Current	T_C=25℃	I_D	60	A
	T_C=100℃		38	
Pulsed Drain Current [A]		I_{DM}	240	A
Total Power Dissipation @ T_C=25℃ [B]		P_D	75	W
Total Power Dissipation @ T_C=100℃ [B]		P_D	30	W
Total Power Dissipation @ T_A=25℃ [C]		P_D	6.2	W
Single Pulse Avalanche Energy [D]		E_{AS}	400	mJ
Thermal Resistance Junction-to-Case		$R_{\theta JC}$	1.67	℃/ W
Thermal Resistance Junction-to-Ambient		$R_{\theta JA}$	20	℃/ W
Junction and Storage Temperature Range		T_J ,T_{STG}	-55～+150	℃

■ Ordering Information (Example)

PREFERED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
YJQ60N03A	F1	Q60N03A	5000	10000	100000	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	30			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=30V,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	1.5	2.5	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}= 10V, I_D=20A		2.6	3.2	mΩ
		V_{GS}= 4.5V, I_D=20A		3.4	4.0	
Diode Forward Voltage	V_{SD}	I_S=20A,V_{GS}=0V		0.85	1.2	V
Gate resistance	Rg	F=1 MHz, Open drain		2.9		Ω
Dynamic Parameters						
Input Capacitance	C_{iss}	V_{DS}=15V,V_{GS}=0V,f=1MHZ		4498		pF
Output Capacitance	C_{oss}			800		
Reverse Transfer Capacitance	C_{rss}			643		
Switching Parameters						
Total Gate Charge	Q_g(10V)	V_{GS}=10V,V_{DS}=15V,I_D=20A		92.7		nC
Total Gate Charge	Q_g(4.5V)			46		
Gate-Source Charge	Q_{gs}			13.5		
Gate-Drain Charge	Q_{gd}			22.8		
Reverse Recovery Charge	Q_{rr}	I_F=20A, di/dt=500A/us		3.0		
Reverse Recovery Time	t_{rr}			15		ns
Turn-on Delay Time	$t_{D(on)}$	V_{GS}=10V, V_{DD}=20V, I_D=4A,R_L=0.75Ω R_{GEN}=3Ω		11		
Turn-on Rise Time	t_r			80		
Turn-off Delay Time	$t_{D(off)}$			39		
Turn-off fall Time	t_f			92		

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

B. The power dissipation P_D is based on $T_{J(MAX)}$=150℃, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heatsinking is used.

C. The value of $R_{\theta JA}$ is measured with the device mounted on 1in2 FR-4 board with 2oz. Copper, in a still air environment with TA =25℃.

D. T_j=25℃, V_{DD}=20V, V_G=10V, L=2.0mH,I_{AS}=20A.

■ Typical Performance Characteristics

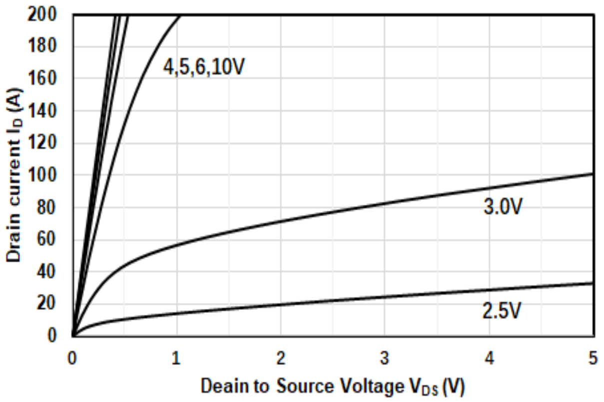


Figure1. Output Characteristics

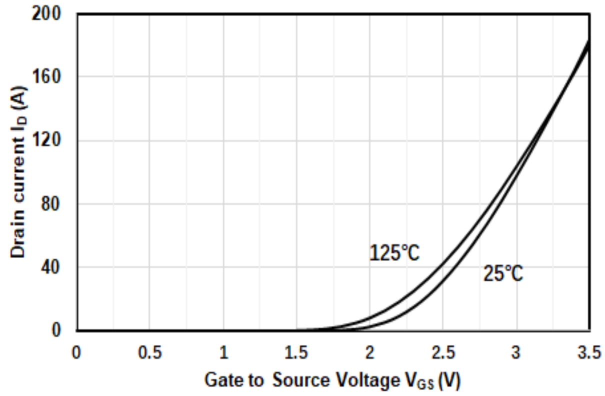


Figure2. Transfer Characteristics

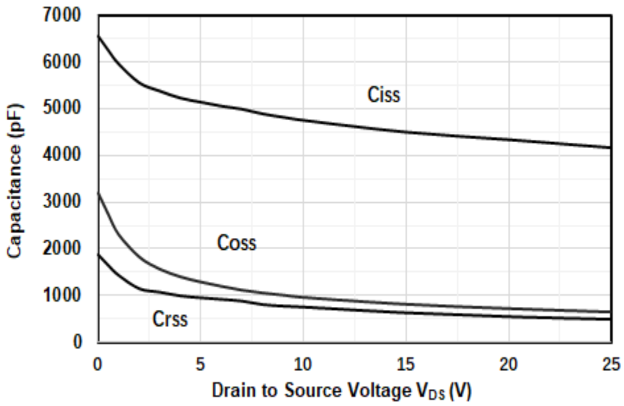


Figure3. Capacitance Characteristics

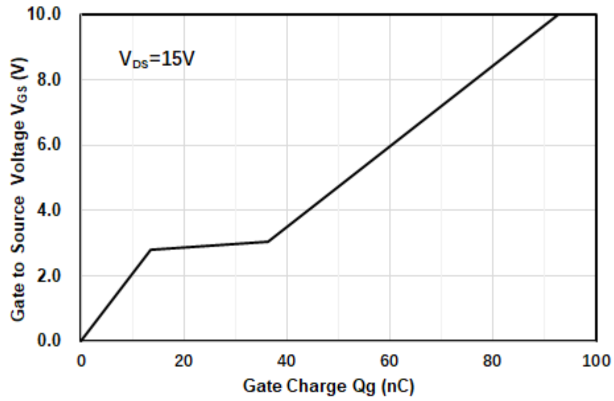


Figure4. Gate Charge

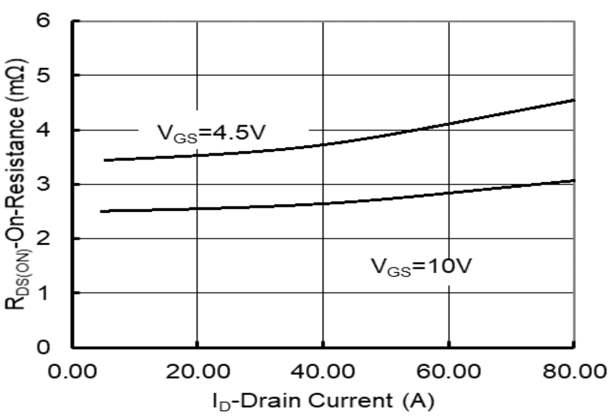


Figure5. Drain-Source on Resistance

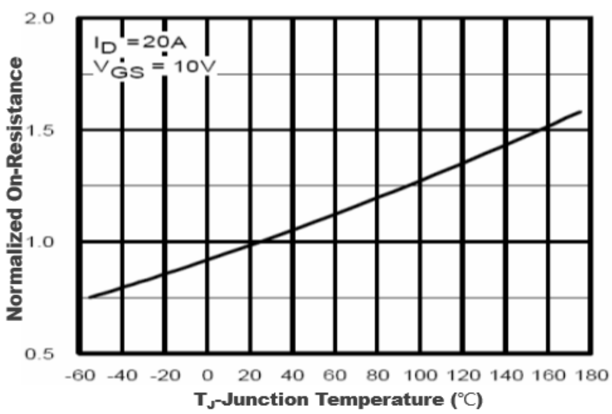


Figure6. Drain-Source on Resistance

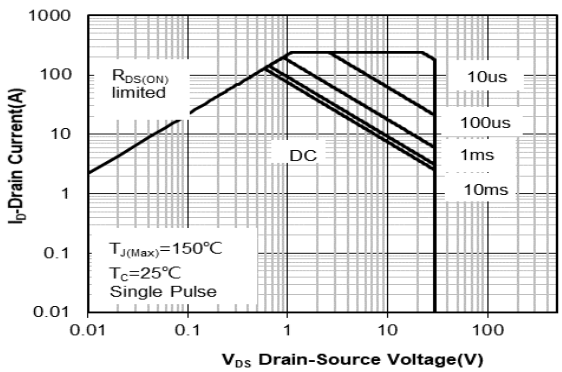


Figure7. Safe Operation Area

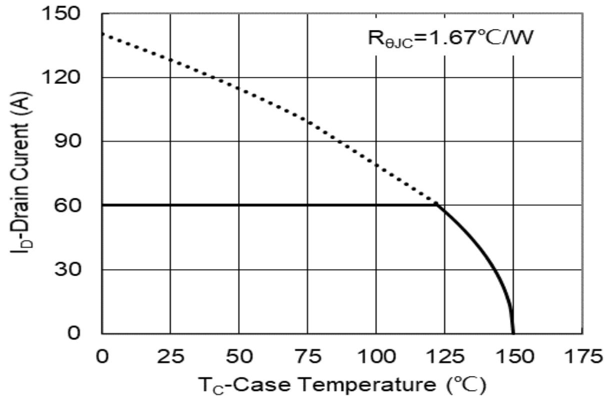


Figure8. Drain current vs. Case Temperature

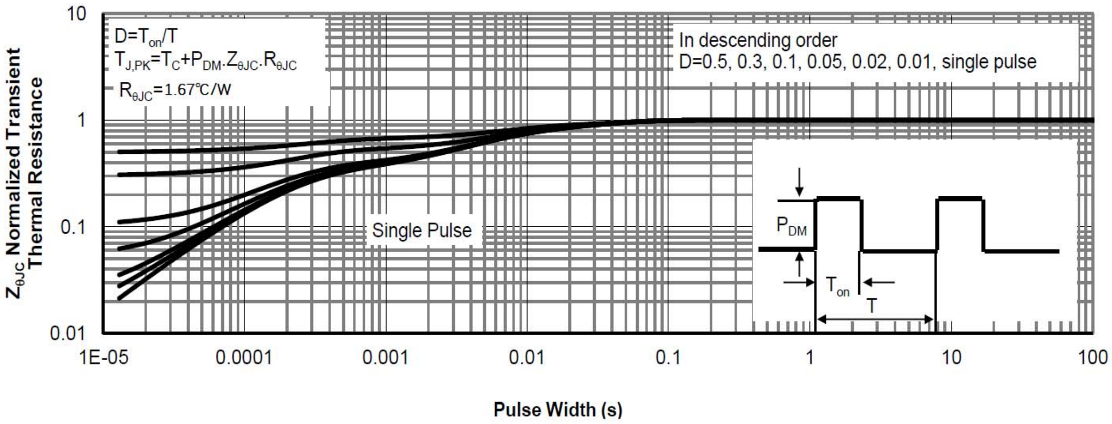
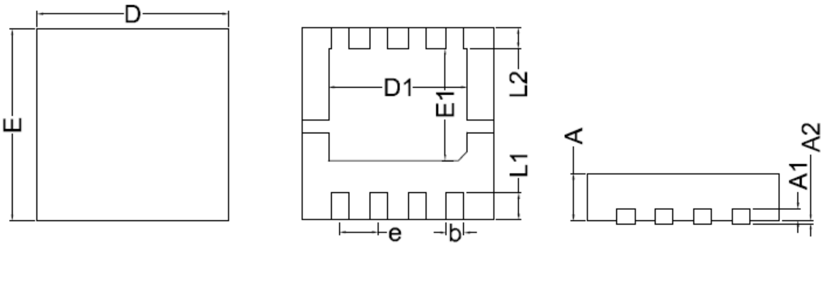


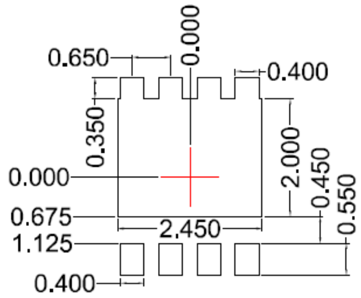
Figure9. Normalized Maximum Transient Thermal Impedance

■ DFN3333 Package information



Top View 正面视图　　Bottom View 背面视图　　Side View 侧面视图

SYMBOL	MILLIMETER		
	MIN	NOM	MAX
D	3.15	3.25	3.35
E	3.15	3.25	3.35
A	0.70	0.80	0.90
A1	0.20 BSC		
A2			0.10
D1	2.20	2.35	2.50
E1	1.80	1.90	2.00
L1	0.35	0.45	0.55
L2	0.35 BSC		
b	0.20	0.30	0.40
e	0.65 BSC		



Suggested Solder Pad Layout
Top View

Note:
1.Controlling dimension:in millimeters.
2.General tolerance:±0.10mm.
3.The pad layout is for reference purposes only.

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