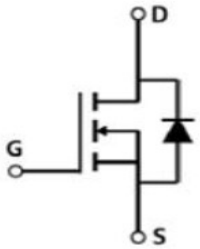
N-Channel Enhancement Mode Field Effect Transistor



TO-220

Product Summary

- V_{DS} 100V
- I_D 70A
- $R_{DS(ON)}$(at V_{GS}=10V) ＜8.6 mohm
- $R_{DS(ON)}$(at V_{GS}=4.5V) ＜11 mohm
- 100% UIS Tested
- 100% ▽V_{DS} Tested

General Description

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

Applications

- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible power supply

■ 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	T_C=25℃	I_D	70	A
	T_C=100℃		44.2	
Pulsed Drain Current [A]		I_{DM}	280	A
Avalanche energy [B]		E_{AS}	200	mJ
Total Power Dissipation [C]	Tc=25℃	P_D	125	W
	Tc=100℃		50	
Junction and Storage Temperature Range		T_J ,T_{STG}	-55～+150	℃

■Thermal resistance

Parameter		Symbol	Typ	Max	Units
Thermal Resistance Junction-to-Ambient [D]	t≤10S	$R_{\theta JA}$	12	15	℃/W
Thermal Resistance Junction-to-Ambient [D]	Steady-State		50	60	
Thermal Resistance Junction-to-Case	Steady-State	$R_{\theta JC}$	0.8	1.0	

■ Ordering Information (Example)

PREFERED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
YJP70G10A	B1	YJP70G10A	50	/	5000	Tube

■ 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}=100,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	1.8	3	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}= 10V, I_D=20A		7.2	8.6	mΩ
		V_{GS}= 4.5V, I_D=20A		8.8	11	mΩ
Diode Forward Voltage	V_{SD}	I_S=20A,V_{GS}=0V			1.3	V
Maximum Body-Diode Continuous Current	I_S				70	A
Gate resistance	R_G	f= 1 MHz, Open drain		0.68		Ω
Dynamic Parameters						
Input Capacitance	C_{iss}	V_{DS}=50V,V_{GS}=0V,f=1MHZ		2270		pF
Output Capacitance	C_{oss}			797		
Reverse Transfer Capacitance	C_{rss}			36		
Switching Parameters						
Total Gate Charge	Q_g	V_{GS}=10V,V_{DS}=50V,I_D=25A		32		nC
Gate-Source Charge	Q_{gs}			11.1		
Gate-Drain Charge	Q_{gd}			4.78		
Reverse Recovery Chrage	Q_{rr}	I_F=20A, di/dt=100A/us		84		
Reverse Recovery Time	t_{rr}			51.5		ns
Turn-on Delay Time	$t_{D(on)}$	V_{GS}=10V, V_{DD}=50V,I_D=25A R_{GEN}=2.2Ω		51		
Turn-on Rise Time	t_r			14.4		
Turn-off Delay Time	$t_{D(off)}$			69.2		
Turn-off fall Time	t_f			20.6		

A. Repetitive rating; pulse width limited by max. junction temperature.
B. V_{DD}=50V, R_G=25Ω, L=0.5mH.
C. Pd is based on max. junction temperature, using junction-case thermal resistance.
D. 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 T_A =25°C. The Power dissipation P_{DSM} is based on $R_{\theta JA}$ t≤ 10s and the maximum allowed junction temperature of 150°C. The value in any given application depends on the user's specific board design.

■ Typical Performance Characteristics

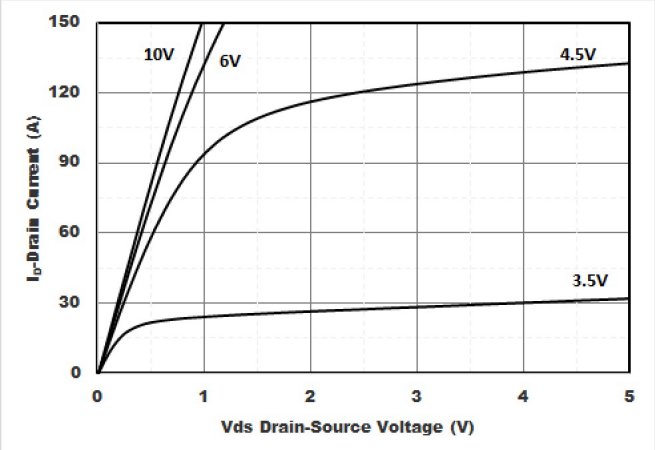


Figure1. Output Characteristics

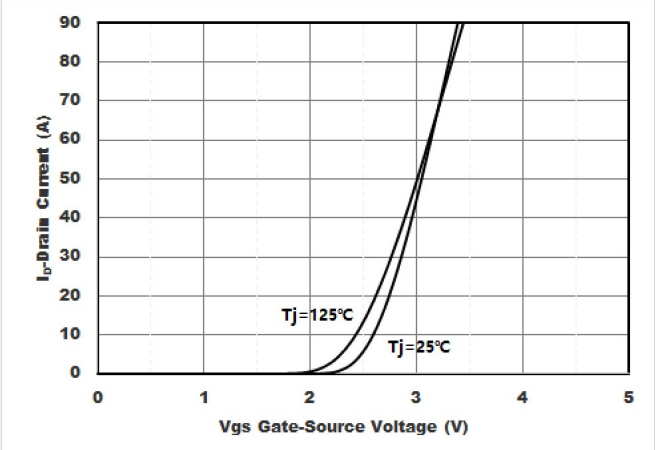


Figure2. Transfer Characteristics

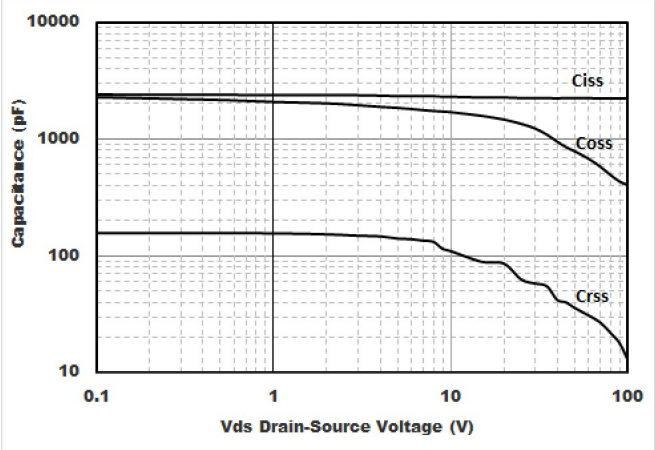


Figure3. Capacitance Characteristics

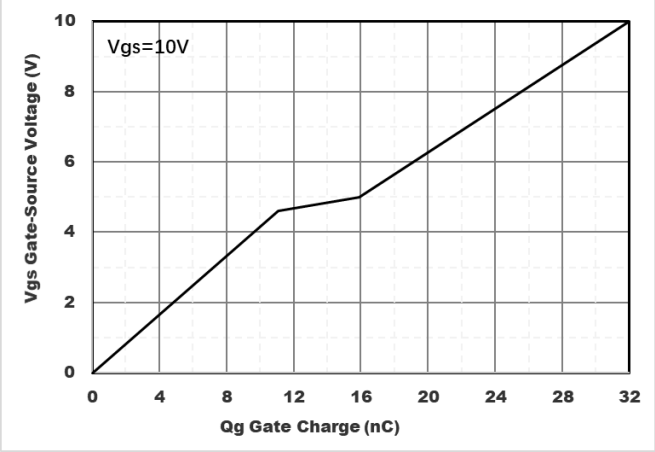


Figure4. Gate Charge

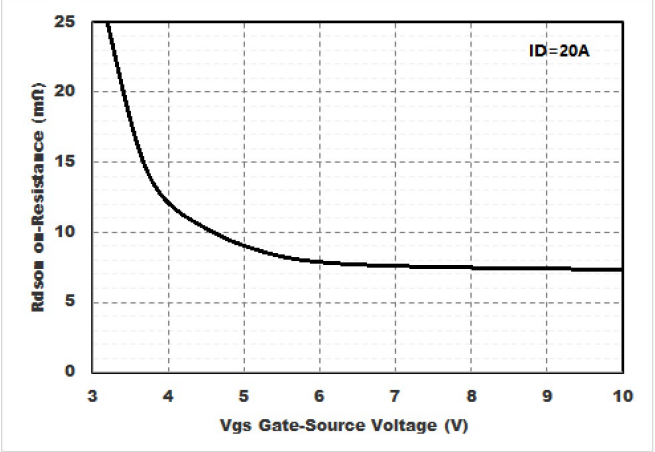


Figure5. : On-Resistance vs. Drain Current and Gate Voltage

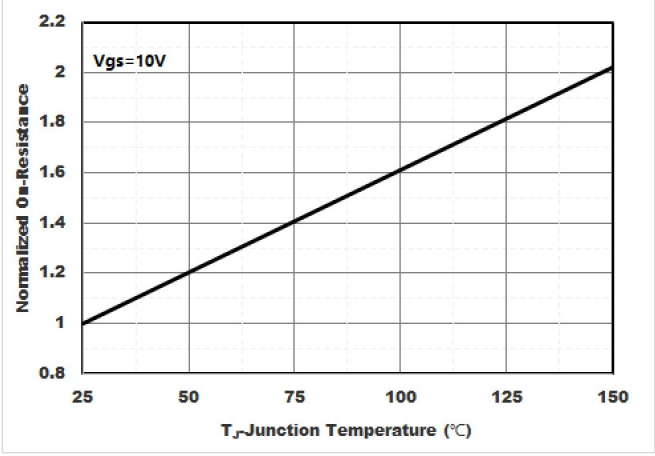


Figure6.Normalized On-Resistance

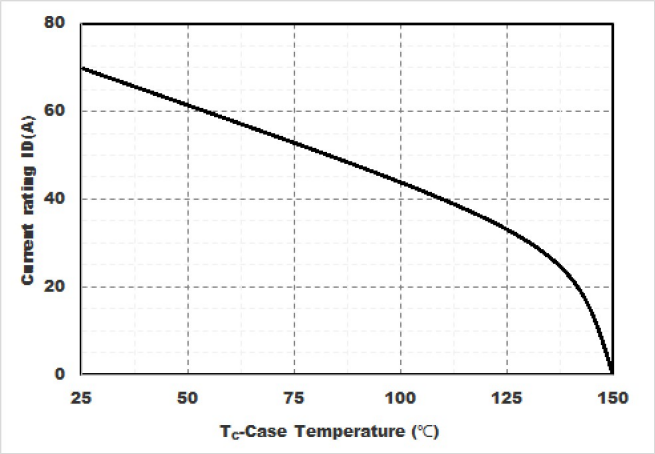


Figure7. Drain current

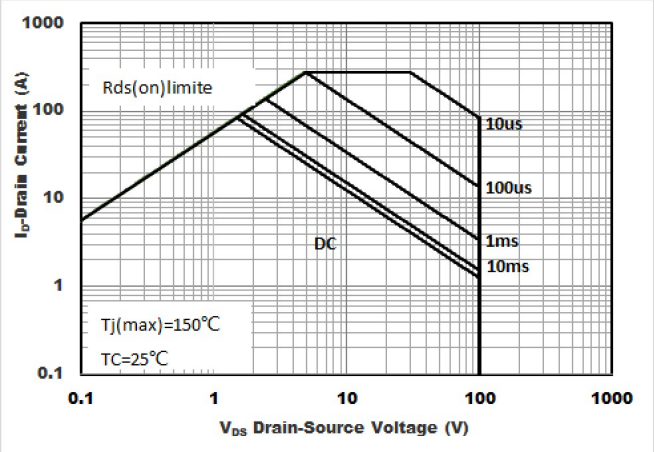


Figure8.Safe Operation Area

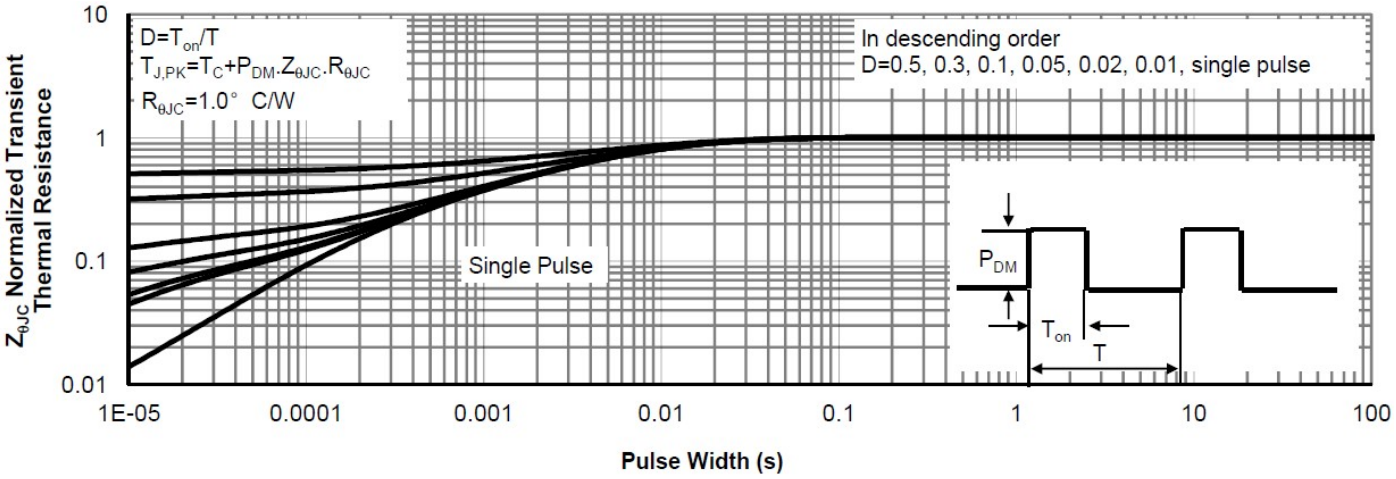
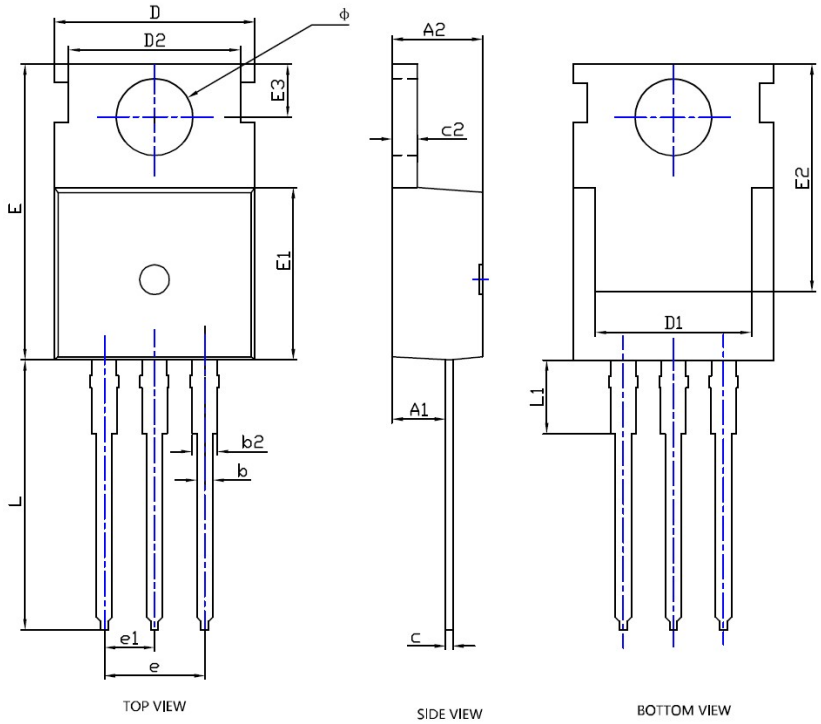


Figure9.Normalized Maximum Transient thermal impedance

■ TO-220 Package information



DIMENSIONS						
SYMBOL	INCHES			Millimeter		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A1	0.091	0.094	0.098	2.300	2.400	2.500
A2	0.173	0.177	0.181	4.400	4.500	4.600
b	0.028	0.031	0.035	0.700	0.800	0.900
b2	0.049	0.052	0.056	1.250	1.330	1.420
c	0.018	0.020	0.022	0.450	0.500	0.550
c2	0.050	0.051	0.052	1.270	1.300	1.330
D	0.382	---	0.402	9.700	---	10.200
D1	0.299	0.315	0.331	7.600	8.000	8.400
D2	0.335	0.343	0.350	8.500	8.700	8.900
E	0.602	0.618	0.634	15.300	15.700	16.100
E1	0.358	0.362	0.366	9.100	9.200	9.300
E2	0.497	0.505	0.513	12.630	12.830	13.030
E3	0.108BSC			2.750BSC		
e	0.200BSC			5.080BSC		
e1	0.100BSC			2.540BSC		
L	0.512	---	0.531	13.000	---	13.500
L1	---	---	0.138	---	---	3.500
ϕ	0.140	0.144	0.148	3.550	3.650	3.750

NOTE:
1.PACKAGE BODY SIZES EXCLUDE MOLD FLASH AND GATE BURRS.
2.TOLERANCE 0.1mm UNLESS OTHERWISE SPECIFIED.

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