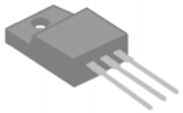
iM6221



N-Channel Enhancement Mode MOSFET

1. Product Information

1.1 Features

- ☑ Advanced trench cell design
- ☑ Low Thermal Resistance

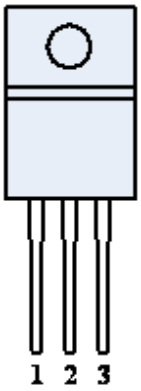
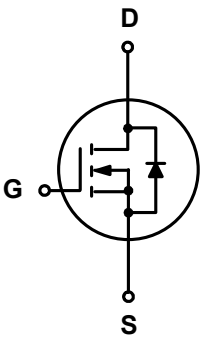
1.2 Applications

- ☑ Motor drivers
- ☑ DC - DC Converter

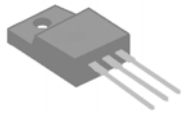
1.3 Quick reference

- ☑ BV ≧ 100 V
- ☑ P_{tot} ≦ 33 W
- ☑ I_D ≦ 86 A
- ☑ $R_{DS(ON)}$ ≦ 2.6 mΩ @ V_{GS} = 10 V
- ☑ $R_{DS(ON)}$ ≦ 3.3 mΩ @ V_{GS} = 6 V

2. Pin Description

Pin	Description	Simplified Outline	Symbol
1	Gate (G)		
2	Drain (D)		
3	Source (S)		

Top View
TO-220F-3L



3. Limiting Values

Symbol	Parameter	Conditions	Min	Max	Unit
V_{DS}	Drain-Source Voltage	T_C = 25 ℃	-	100	V
V_{GS}	Gate-Source Voltage	T_C = 25 ℃	-	± 20	V
I_D*	Drain Current (DC)	T_C = 25 ℃, V_{GS} = 10 V	-	86	A
		T_C = 100 ℃, V_{GS} = 10 V	-	54	A
I_{DM}*,**	Drain Current (Pulsed)	T_C = 25 ℃, V_{GS} = 10 V	-	344	A
P_{tot}*	Total Power Dissipation	T_C = 25 ℃	-	33	W
T_{stg}	Storage Temperature		- 55	150	℃
T_J	Junction Temperature		-	150	℃
I_S	Diode Forward Current	T_C = 25 ℃	-	86	A
E_{AS}*	Single Pulsed Avalanche Energy	V_{DD}= 50 V , L= 1.0 mH	-	2244	mJ
$R_{\theta JA}$*	Thermal Resistance-Junction to Ambient		-	50	℃ / W
$R_{\theta JC}$*	Thermal Resistance-Junction to Case		-	3.7	

Notes：

* Surface Mounted on 1 in^2 pad area, t ≤ 10 sec

** Pulse width ≤ 300 μs, duty cycle ≤ 2 %

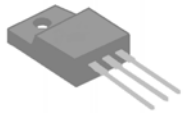
*** Limited by bonding wire

4. Marking Information

Product Name	Marking
iM6221	iM6221 XXXXX X : Date Code

5. Ordering Code

iM6221



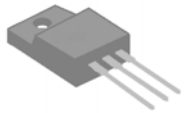
6. Electrical Characteristics (T_A = 25 °C Unless Otherwise Noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS} = 0 V, I_D = 250 μA	100	-	-	V
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_{DS} = 250 μA	2	-	4	V
I_{DSS}	Zero Gate Voltage Source Current	V_{DS} = 80 V, V_{GS} = 0 V	-	-	1	μA
I_{GSS}	Gate Leakage Current	V_{GS} = ± 20 V, V_{DS} = 0 V	-	-	± 100	nA
$R_{DS(ON)}$[a]	Drain-Source On-State Resistance	V_{GS} = 10 V, I_D = 20 A	-	2.1	2.6	mΩ
		V_{GS} = 6 V, I_D = 10 A	-	2.5	3.3	
Diode Characteristics						
V_{SD}[a]	Diode Forward Voltage	I_{SD} = 20 A, V_{GS} = 0 V	-	-	1.3	V
t_{rr}	Reverse Recovery Time	I_{SD} = 20 A, dI_{SD}/dt = 100 A/μs	-	121	-	nS
Q_{rr}	Reverse Recovery Charge		-	406	-	nC
Dynamic Characteristics[b]						
C_{iss}	Input Capacitance	V_{GS} = 0 V, V_{DS} = 50 V Frequency = 1 MHz	-	13355	-	pF
C_{oss}	Output Capacitance		-	2061	-	
C_{rss}	Reverse Transfer Capacitance		-	100	-	
t_d(on)	Turn-on Delay Time	V_{DS} = 50 V, V_{GEN} = 10 V, R_G = 3.9 Ω, R_L = 2.5 Ω, I_D = 20 A	-	32	-	nS
t_r	Turn-on Rise Time		-	71	-	
t_d(off)	Turn-off Delay Time		-	140	-	
t_f	Turn-off Fall Time		-	94	-	
Gate Charge Characteristics[b]						
Q_g	Total Gate Charge	V_{DS} = 50 V, V_{GS} = 10 V, I_{DS} = 20 A	-	218	-	nC
Q_{gs}	Gate-Source Charge		-	66	-	
Q_{gd}	Gate-Drain Charge		-	48	-	

Notes :

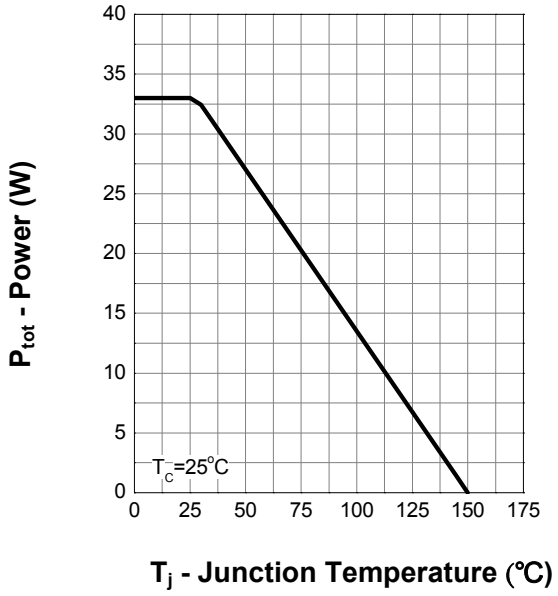
a : Pulse test ; pulse width ≤ 300 μs, duty cycle ≤ 2 %

b : Guaranteed by design, not subject to production testing

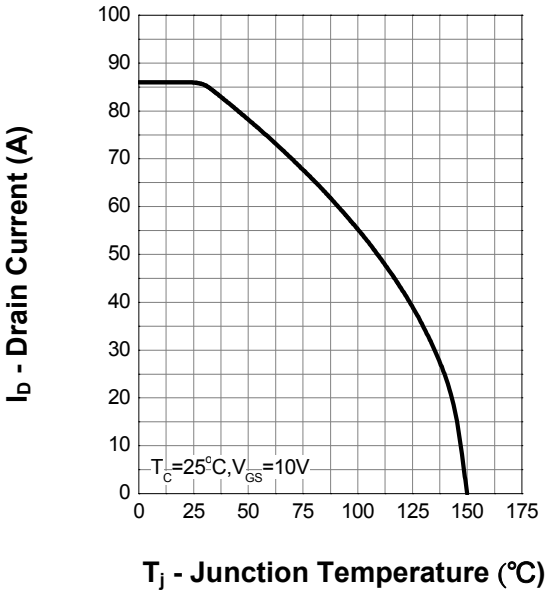


7. Typical Characteristics

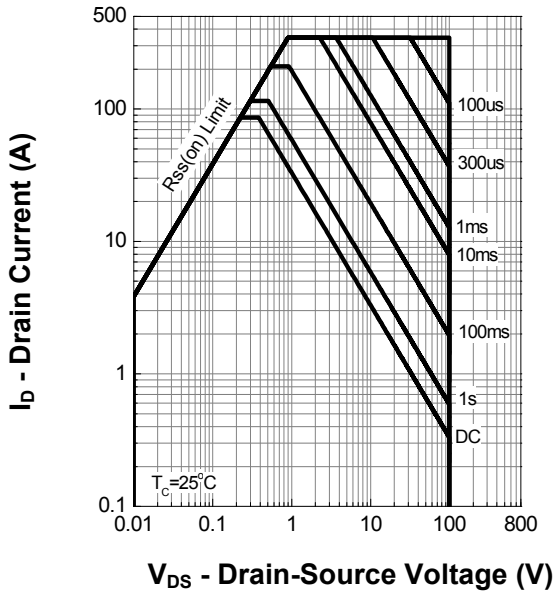
Power Capability



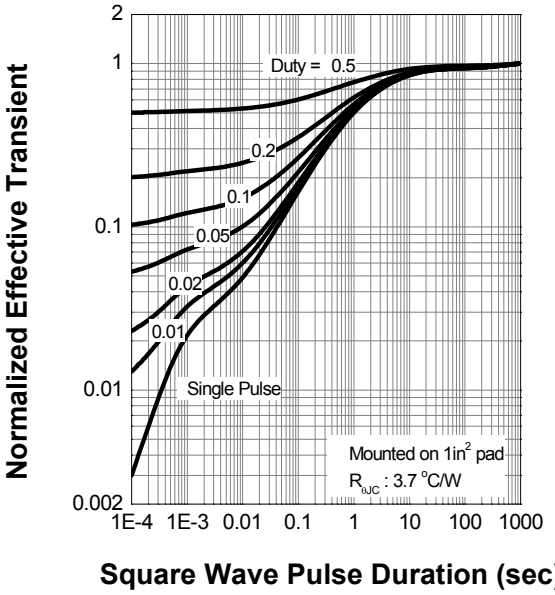
Current Capability



Safe Operation Area

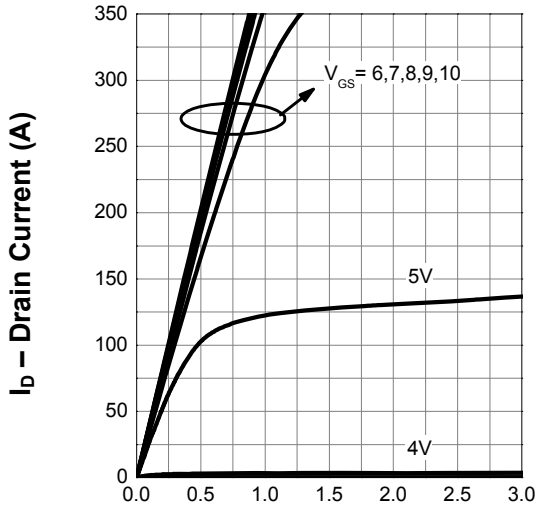


Thermal Transient Impedance

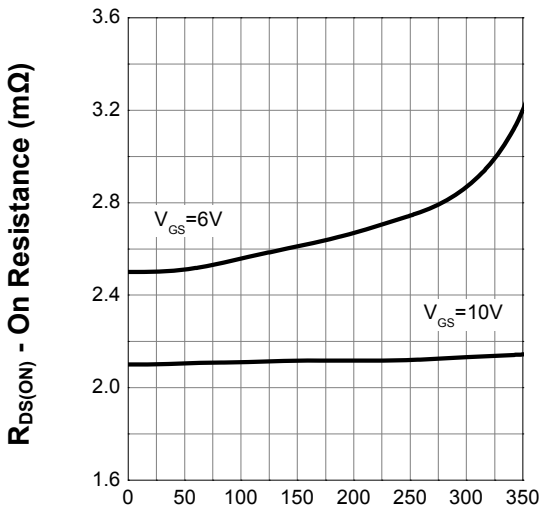


7. Typical Characteristics (cont.)

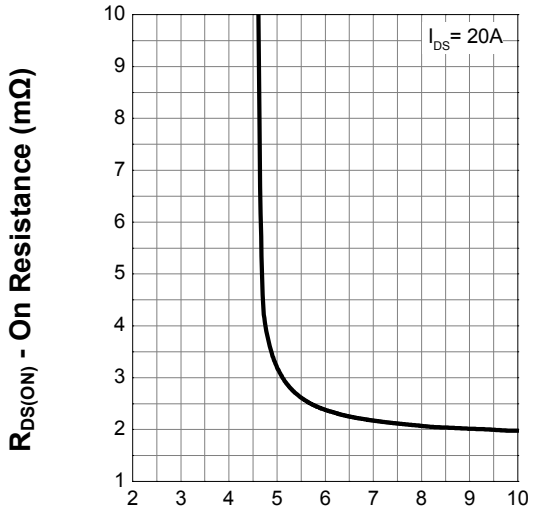
Output Characteristics



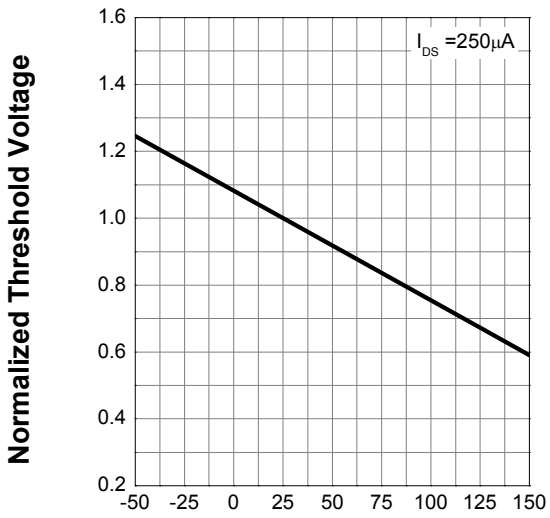
Drain-Source On Resistance



Transfer Characteristics

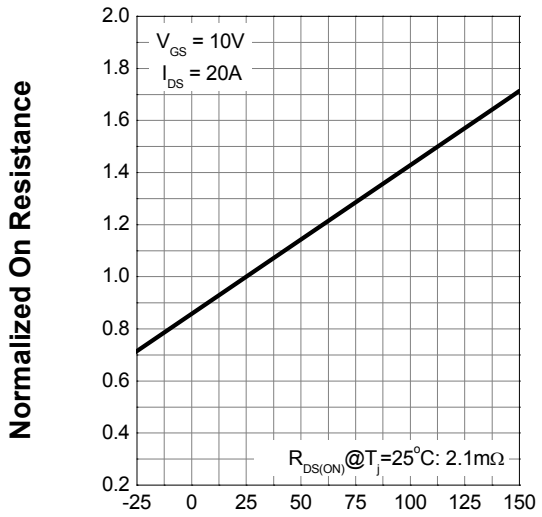


Gate Threshold Voltage

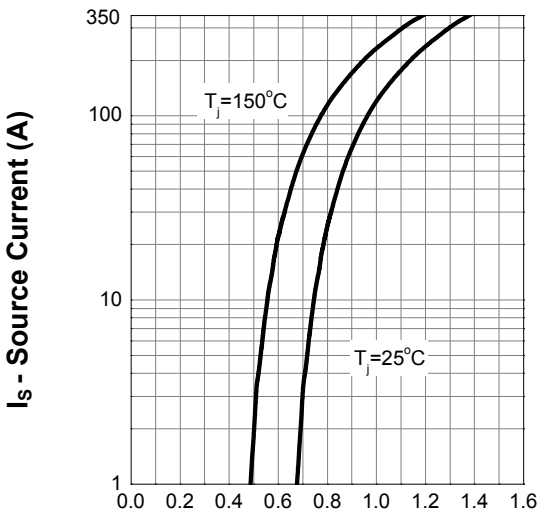


7. Typical Characteristics (cont.)

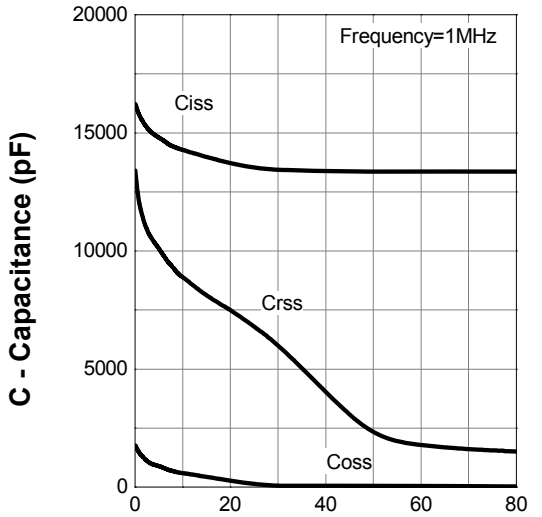
Drain-Source On Resistance



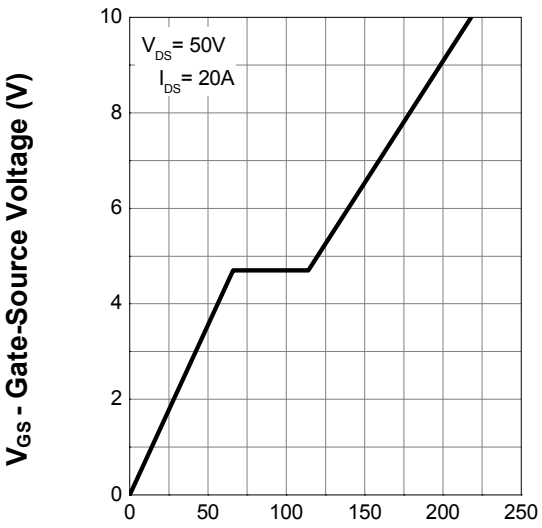
Body Diode Characteristics



Capacitance

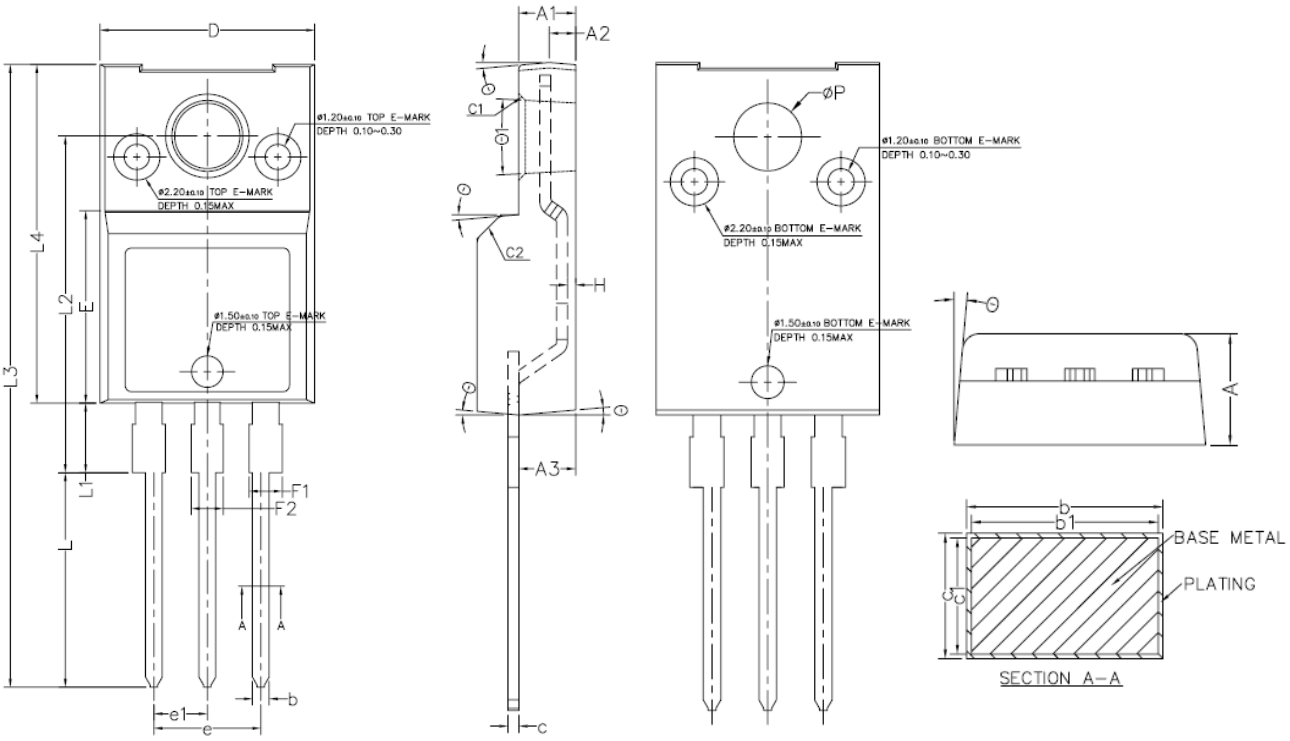


Gate Charge

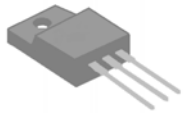


8. Package Dimensions

TO-220F-3L



Symbol	Dimensions In Millimeters	
	MIN.	MAX.
A	4.4	4.60
A1	2.5	2.70
A2	1.10	1.30
A3	2.49	2.69
b	0.76	0.89
b1	0.75	0.85
c	0.46	0.59
c1	0.45	0.55
C1	0.20	0.40
C2	1.00	1.20
D	10.10	10.30
E	9.05	9.25
e	4.98	5.18
e1	2.44	2.64
F1	1.22	1.60
F2	1.17	1.55
H	0.32	0.42



L	10.00	10.40
L1	3.15	3.45
L2	15.85	16.15
L3	29.3	29.90
L4	16.00	16.20
P	3.00	3.20
Θ	3°	7°
Θ1	4°	8°