

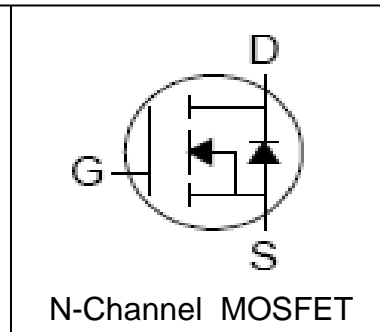
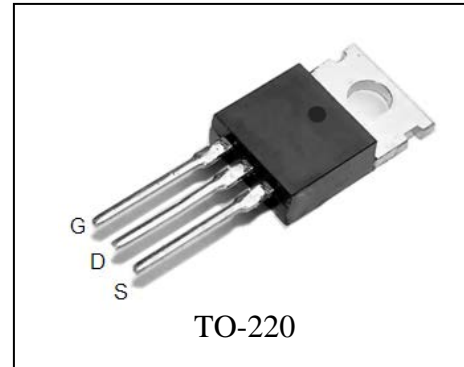
Features

- 70V/120A,
 $R_{DS(ON)} = 6m\Omega$ (Typ.) @ $V_{GS} = 10V$
- Ultra Low On-Resistance
- Exceptional dv/dt capability
- Fast Switching and Fully Avalanche Rated
- 100% avalanche tested
- 175°C Operating Temperature
- Lead Free and Green Available

Applications

- Switching Application Systems
- Inverter Systems
- DC Motor Controller

Pin Description



Absolute Maximum Ratings

Symbol	Parameter	Rating	Unit
Common Ratings ($T_A = 25^\circ\text{C}$ Unless Otherwise Noted)			
V_{DSS}	Drain-Source Voltage	70	V
V_{GSS}	Gate-Source Voltage	± 25	
T_J	Maximum Junction Temperature	175	$^\circ\text{C}$
T_{STG}	Storage Temperature Range	-55 to 175	$^\circ\text{C}$
I_S	Diode Continuous Forward Current	$T_C = 25^\circ\text{C}$ 120 ^①	A
Mounted on Large Heat Sink			
I_{DP}	300 μs Pulse Drain Current Tested	$T_C = 25^\circ\text{C}$ 380 ^②	A
I_D	Continuous Drain Current	$T_C = 25^\circ\text{C}$ 120 ^①	A
		$T_C = 100^\circ\text{C}$ 90 ^①	
P_D	Maximum Power Dissipation	$T_C = 25^\circ\text{C}$ 150	W
		$T_C = 100^\circ\text{C}$ 75	
$R_{\theta JC}$	Thermal Resistance-Junction to Case	1	$^\circ\text{C}/\text{W}$
Drain-Source Avalanche Ratings			
E_{AS} ^③	Avalanche Energy, Single Pulsed	424	mJ

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

Symbol	Parameter	Test Condition	IRF3205Z			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250μA	70			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 60V, V _{GS} =0V T _J =85°C			1 30	μA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250μA	2	3	4	V
I _{GSS}	Gate Leakage Current	V _{GS} =±20V, V _{DS} =0V			±100	nA
R _{DS(ON)} ^④	Drain-Source On-state Resistance	V _{GS} = 10V, I _{DS} =40A		6	7.6	mΩ
Diode Characteristics						
V _{SD} ^④	Diode Forward Voltage	I _{SD} =40A, V _{GS} =0V			1.2	V
t _{rr}	Reverse Recovery Time	I _{SD} =40A, dI _{SD} /dt=100A/μs		50		ns
Q _{rr}	Reverse Recovery Charge			95		nC
Dynamic Characteristics ^⑤						
R _G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz		1.3		Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} = 30V, Frequency=1.0MHz		4500		pF
C _{oss}	Output Capacitance			430		
C _{rss}	Reverse Transfer Capacitance			240		
t _{d(ON)}	Turn-on Delay Time	V _{DD} =30V, R _L =30Ω, I _{DS} = 1A, V _{GEN} = 10V, R _G =8Ω		14		ns
t _r	Turn-on Rise Time			17		
t _{d(OFF)}	Turn-off Delay Time			40		
t _f	Turn-off Fall Time			62		
Gate Charge Characteristics ^⑤						
Q _g	Total Gate Charge	V _{DS} =30V, V _{GS} = 10V, I _{DS} =40A		78		nC
Q _{gs}	Gate-Source Charge			13		
Q _{gd}	Gate-Drain Charge			24		

Notes: ① Calculated continuous current based on maximum allowable junction temperature. Package limitation current is 75A.

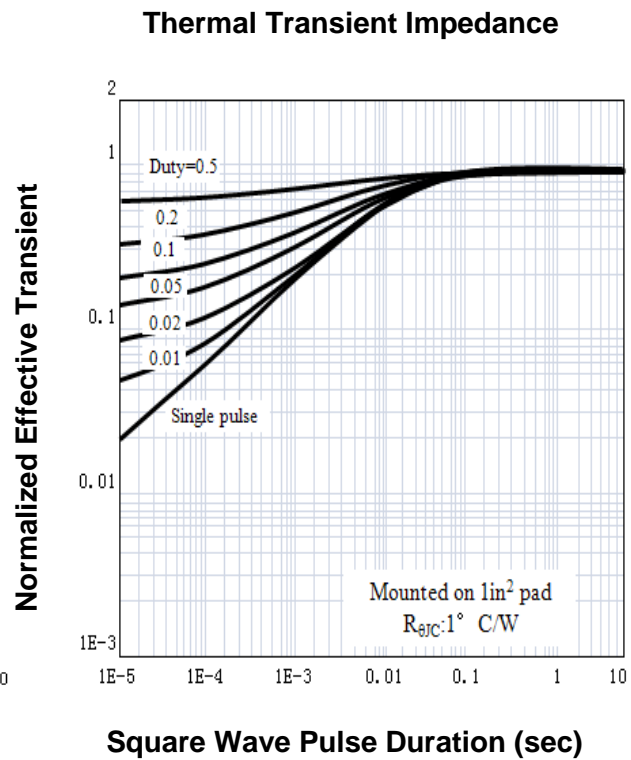
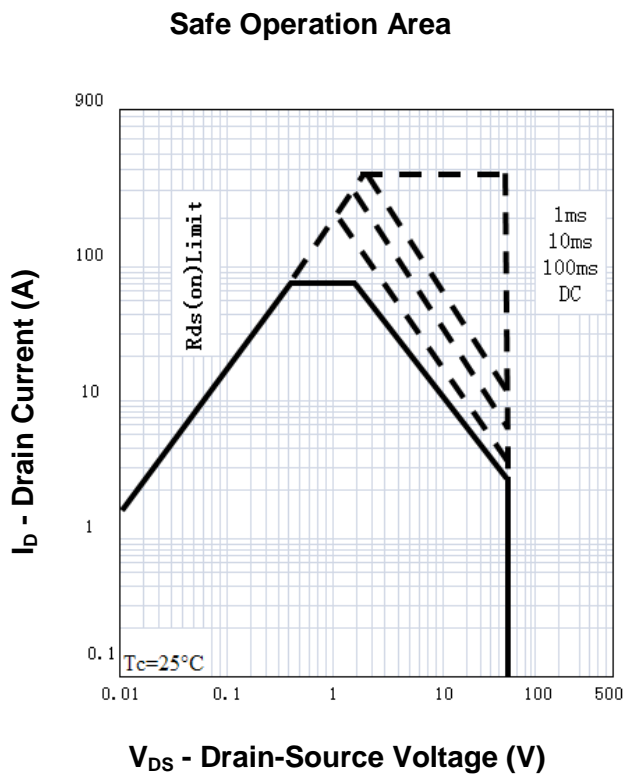
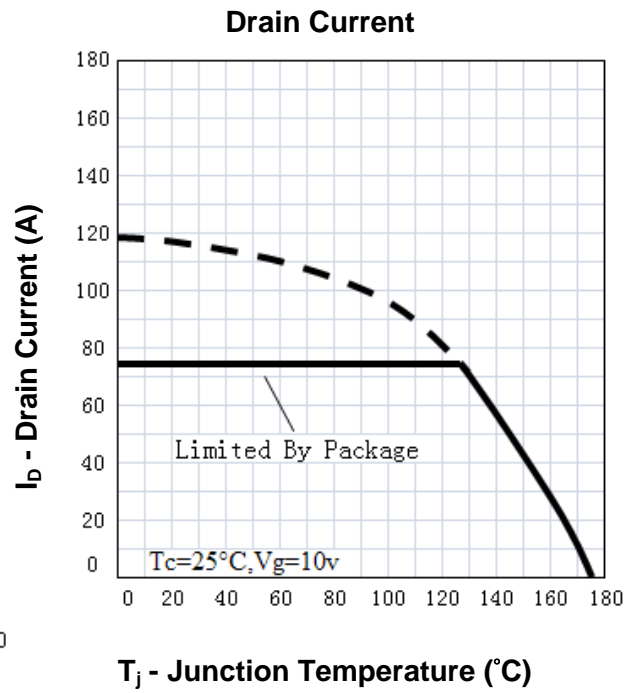
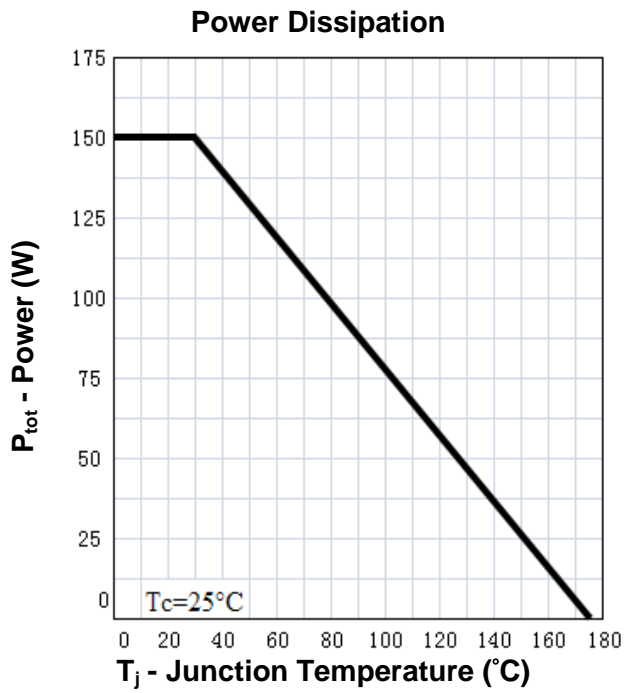
② Pulse width limited by safe operating area.

③ Limited by T_{Jmax}, I_{AS} =27A, V_{DD} =48V, R_G = 50Ω , Starting T_J = 25°C.

④ Pulse test ; Pulse width≤300μs, duty cycle≤2%.

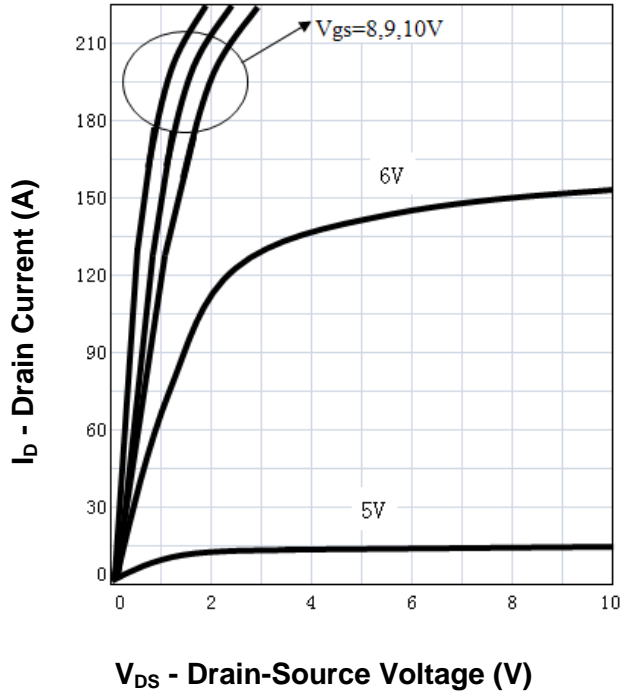
⑤ Guaranteed by design, not subject to production testing.

Typical Characteristics

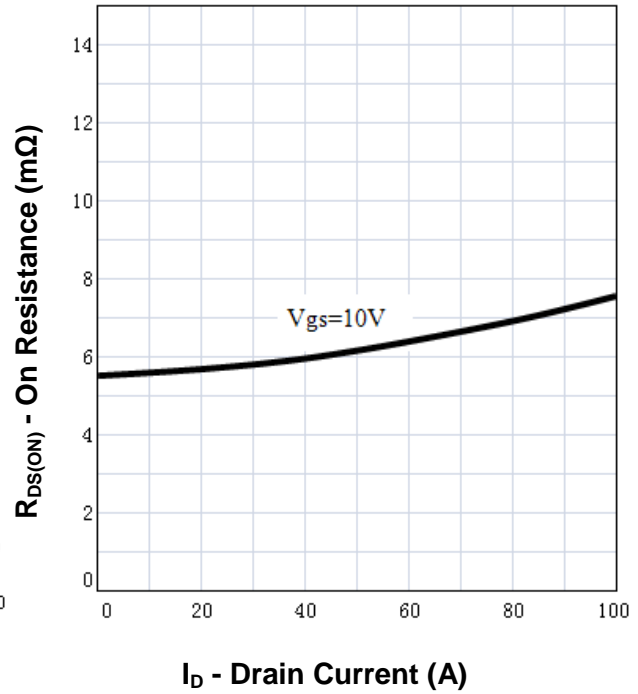


Typical Characteristics

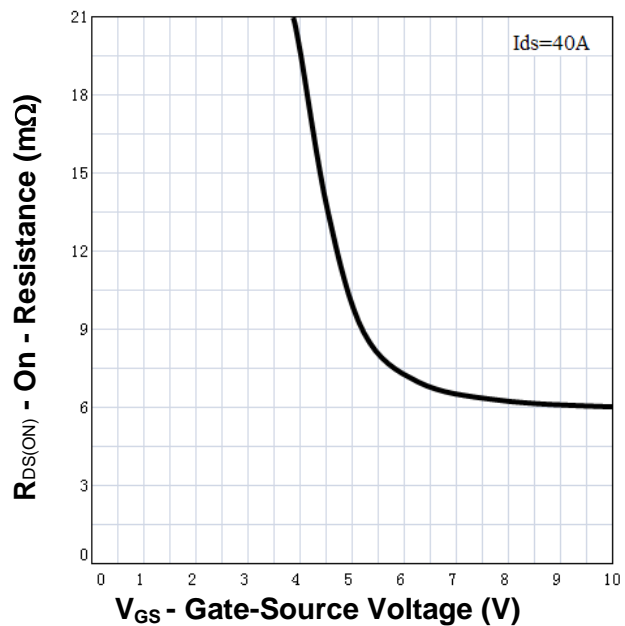
Output Characteristics



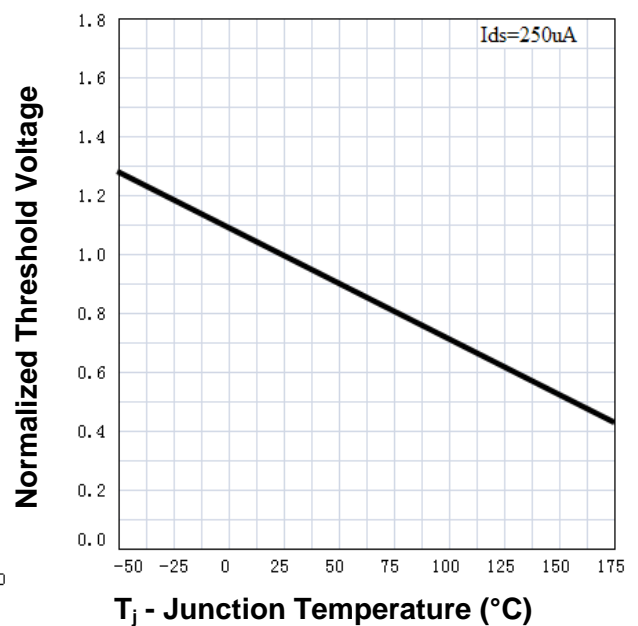
Drain-Source On Resistance



Drain-Source On Resistance

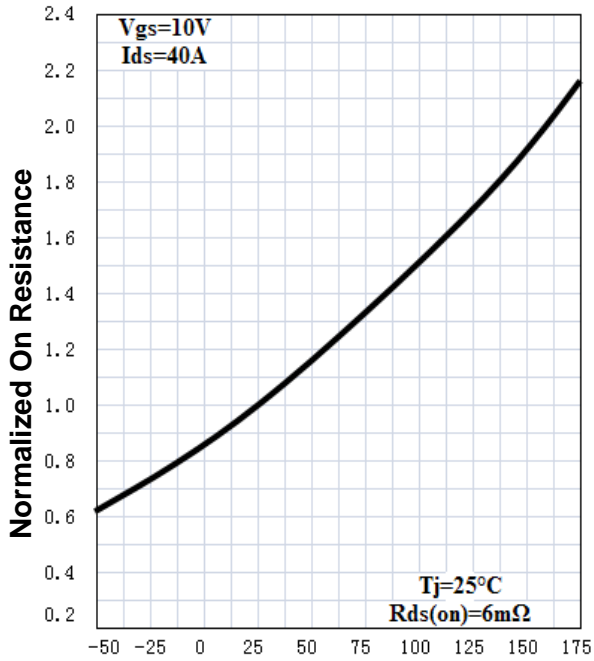


Gate Threshold Voltage



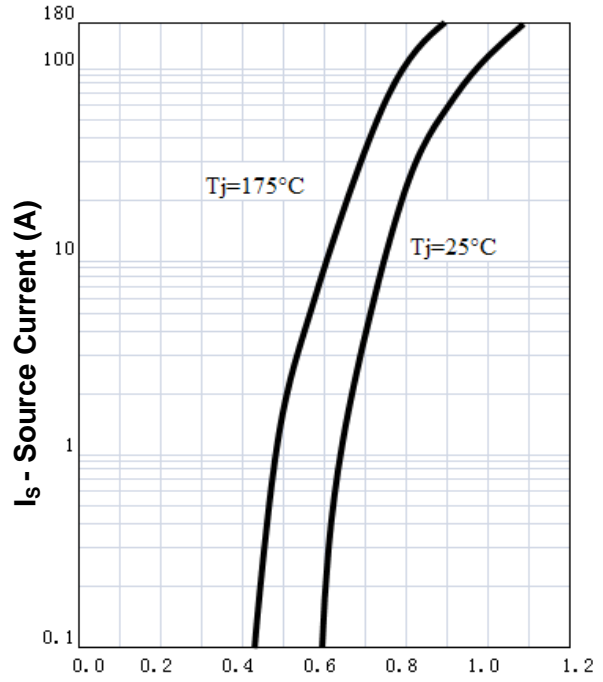
Typical Characteristics

Drain-Source On Resistance



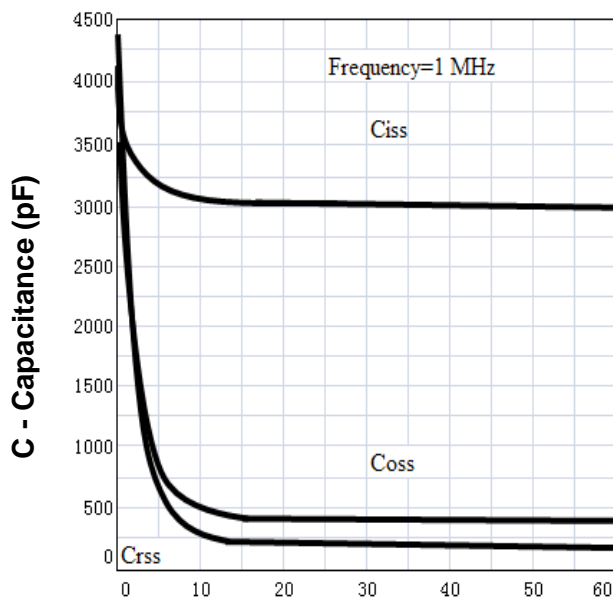
T_j - Junction Temperature (°C)

Source-Drain Diode Forward



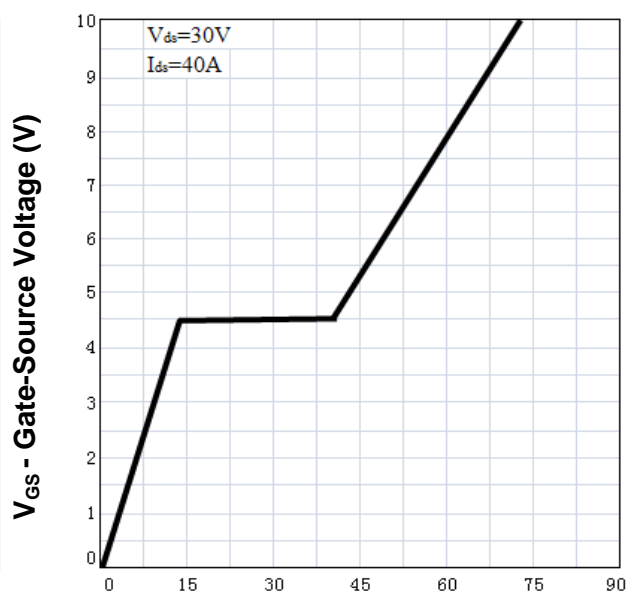
V_{SD} - Source-Drain Voltage (V)

Capacitance



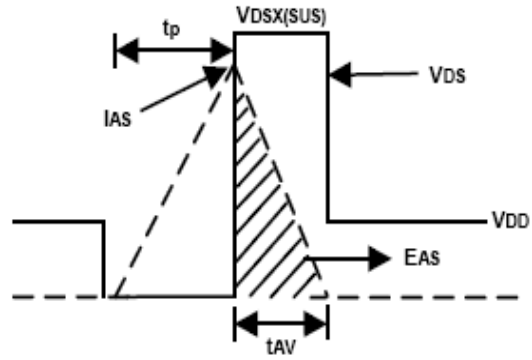
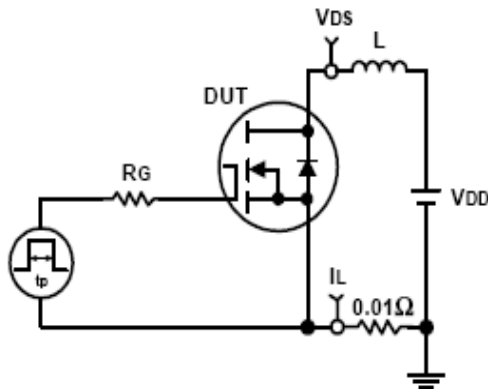
V_{DS} - Drain-Source Voltage (V)

Gate Charge

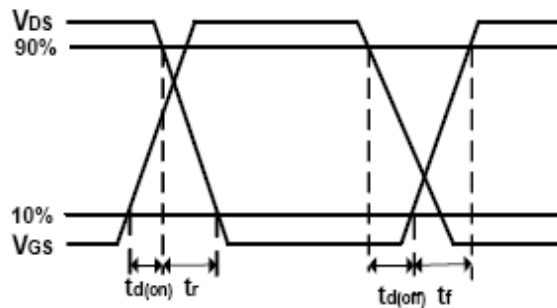
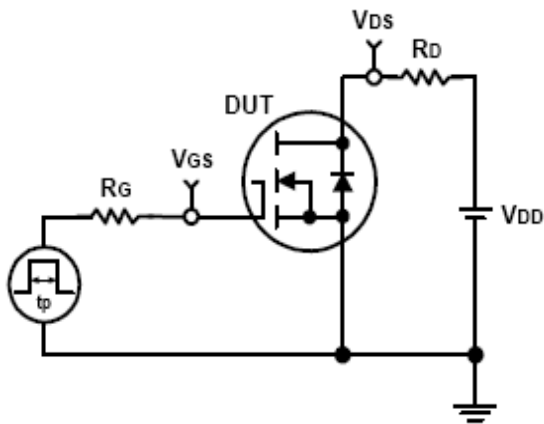


Q_G - Gate Charge (nC)

Avalanche Test Circuit and Waveforms



Switching Time Test Circuit and Waveforms

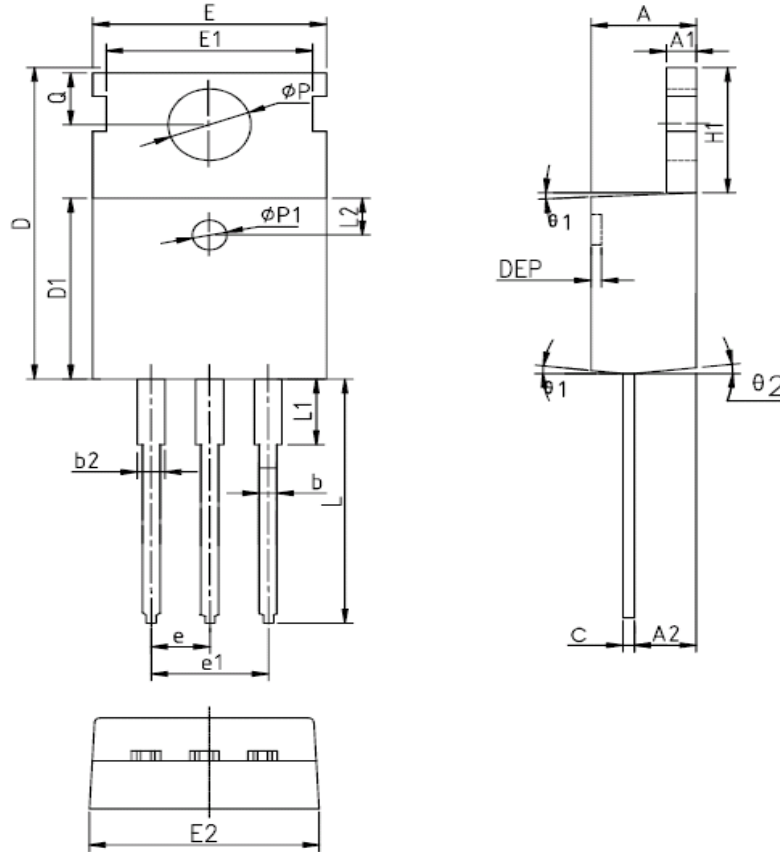


Ordering and Marking Information

Device	Marking	Package	Packaging	Quantity	Reel Size	Tape width
IRF3205Z		TO-220	Tube	50	-	-

Package Information

TO-220FB-3L



SYMBOL	MM			INCH			SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX		MIN	NOM	MAX	MIN	NOM	MAX
A	4.40	4.57	4.70	0.173	0.180	0.185	øp1	1.40	1.50	1.60	0.055	0.059	0.063
A1	1.27	1.30	1.33	0.050	0.051	0.052	e	2.54BSC			0.1BSC		
A2	2.35	2.40	2.50	0.093	0.094	0.098	e1	5.08BSC			0.2BSC		
b	0.77	-	0.90	0.030	-	0.035	H1	6.40	6.50	6.60	0.252	0.256	0.260
b2	1.23	-	1.36	0.048	-	0.054	L	12.75	-	13.17	0.502	-	0.519
C	0.48	0.50	0.52	0.019	0.020	0.021	L1	-	-	3.95	-	-	0.156
D	15.40	15.60	15.80	0.606	0.614	0.622	L2	2.50REF.			0.098REF.		
D1	9.00	9.10	9.20	0.354	0.358	0.362	øp	3.57	3.60	3.63	0.141	0.142	0.143
DEP	0.05	0.10	0.20	0.002	0.004	0.008	Q	2.73	2.80	2.87	0.107	0.110	0.113
E	9.70	9.90	10.10	0.382	0.389	0.398	θ 1	5°	7°	9°	5°	7°	9°
E1	-	8.70	-	-	0.343	-	θ 2	1°	3°	5°	1°	3°	5°
E2	9.80	10.00	10.20	0.386	0.394	0.401							

ALL DIMENSIONS REFER TO JEDEC STANDARD
DO NOT INCLUDE MOLD FLASH OR PROTRUSIONS