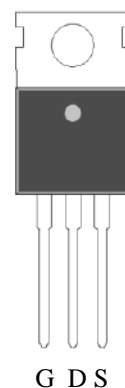


## N-Channel Enhancement Mode Power MOSFET

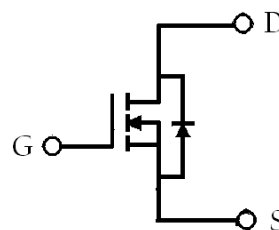
### Features:

- Low On Resistance
- Simple Drive Requirement
- Low Gate Charge
- Fast Switching Characteristic
- RoHS compliant package

TO-220



$BV_{DSS}$	60V
$I_D @ V_{GS}=10V, T_C=25^\circ C$	60A
$I_D @ V_{GS}=10V, T_A=25^\circ C$	11.4A
$R_{DS(ON)} @ V_{GS}=10V, I_D=11A$	6.1m $\Omega$
$R_{DS(ON)} @ V_{GS}=4.5V, I_D=11A$	12m $\Omega$



G : Gate    D : Drain    S : Source

### Ordering Information

Device	Package	Shipping
KEB7D0N06R	TO-220 (RoHS compliant)	50 pcs/tube, 20 tubes/box, 5 boxes / carton

### Absolute Maximum Ratings (T<sub>A</sub>=25°C)

Parameter	Symbol	Limits	Unit	
Drain-Source Voltage	V <sub>DS</sub>	60	V	
Gate-Source Voltage	V <sub>GS</sub>	±20		
Continuous Drain Current @ V <sub>GS</sub> =10V, T <sub>C</sub> =25°C	I <sub>D</sub>	60	A	
Continuous Drain Current @ V <sub>GS</sub> =10V, T <sub>C</sub> =100°C		38		
Continuous Drain Current @ V <sub>GS</sub> =10V, T <sub>A</sub> =25°C		11.4		
Continuous Drain Current @ V <sub>GS</sub> =10V, T <sub>A</sub> =70°C		9.1		
Pulsed Drain Current		I <sub>DM</sub>		240
Continuous Body Diode Forward Current @ T <sub>A</sub> =25°C	I <sub>S</sub>	10		
Pulsed Body Diode Forward Current @ T <sub>A</sub> =25°C	I <sub>SM</sub>	40		
Avalanche Current @ L=0.1mH	I <sub>AS</sub>	25		
Avalanche Energy @ L=0.5mH	E <sub>AS</sub>	56	mJ	
Total Power Dissipation	P <sub>D</sub>	T <sub>C</sub> =25°C	57	W
		T <sub>C</sub> =100°C	23	
		T <sub>A</sub> =25°C	2.1	
		T <sub>A</sub> =70°C	1.3	
Operating Junction and Storage Temperature Range	T <sub>J</sub> , T <sub>stg</sub>	-55~+150	°C	

### Thermal Data

Parameter	Symbol	Steady State	Unit
Thermal Resistance, Junction-to-case	R <sub>θJC</sub>	2.2	°C/W
Thermal Resistance, Junction-to-ambient	R <sub>θJA</sub>	60	

Note:

- \*a. The power dissipation P<sub>D</sub> is based on T<sub>J(MAX)</sub>=150°C, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heatsinking is used.
- \*b. The value of R<sub>θJA</sub> is measured with the device mounted on 1 in<sup>2</sup> FR -4 board with 2 oz. copper, in a still air environment with T<sub>A</sub>=25°C. The power dissipation P<sub>DSM</sub> is based on R<sub>θJA</sub> and the maximum allowed junction temperature of 150°C. The value in any given application depends on the user's specific board design.
- \*c. Repetitive rating, pulse width limited by junction temperature T<sub>J(MAX)</sub>=150°C. Ratings are based on low frequency and low duty cycles to keep initial T<sub>J</sub>=25°C.

**Characteristics (T<sub>A</sub>=25°C, unless otherwise specified)**

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
<b>Static</b>					
BV <sub>DSS</sub>	60	-	-	V	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA
V <sub>GS(th)</sub>	1	-	2.5		V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA
G <sub>FS</sub>	-	16	-	S	V <sub>DS</sub> =10V, I <sub>D</sub> =10A
I <sub>GSS</sub>	-	-	±100	nA	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V
I <sub>DSS</sub>	-	-	1	μA	V <sub>DS</sub> =48V, V <sub>GS</sub> =0V
R <sub>DS(ON)</sub>	-	6.1	8	mΩ	V <sub>GS</sub> =10V, I <sub>D</sub> =11A
	-	12	17		V <sub>GS</sub> =4.5V, I <sub>D</sub> =11A
<b>Dynamic</b>					
C <sub>iss</sub>	-	2333	-	pF	V <sub>DS</sub> =30V, V <sub>GS</sub> =0V, f=1MHz
C <sub>oss</sub>	-	338	-		
C <sub>rss</sub>	-	37	-		
R <sub>g</sub>	-	2	-	Ω	f=1MHz
Q <sub>g</sub> *1, 2	-	37	-	nC	V <sub>DS</sub> =48V, V <sub>GS</sub> =10V, I <sub>D</sub> =11A
Q <sub>gs</sub> *1, 2	-	9	-		
Q <sub>gd</sub> *1, 2	-	8	-		
t <sub>d(ON)</sub> *1, 2	-	20	-	ns	V <sub>DS</sub> =30V, V <sub>GS</sub> =10V, I <sub>D</sub> =11A, R <sub>GS</sub> =4.7Ω
t <sub>r</sub> *1, 2	-	19	-		
t <sub>d(OFF)</sub> *1, 2	-	62	-		
t <sub>f</sub> *1, 2	-	13	-		
<b>Source-Drain Diode</b>					
V <sub>SD</sub> *1	-	0.8	1.2	V	I <sub>S</sub> =10A, V <sub>GS</sub> =0V
t <sub>rr</sub>	-	24	-	ns	I <sub>F</sub> =10A, dI <sub>F</sub> /dt=100A/μs
Q <sub>rr</sub>	-	19	-	nC	

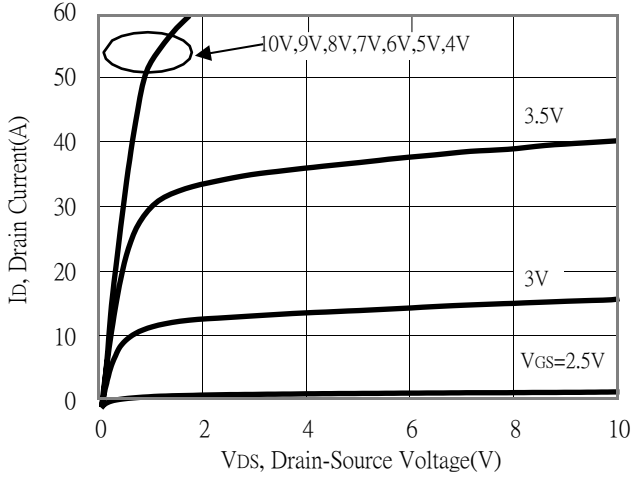
Note:

\*1. Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%

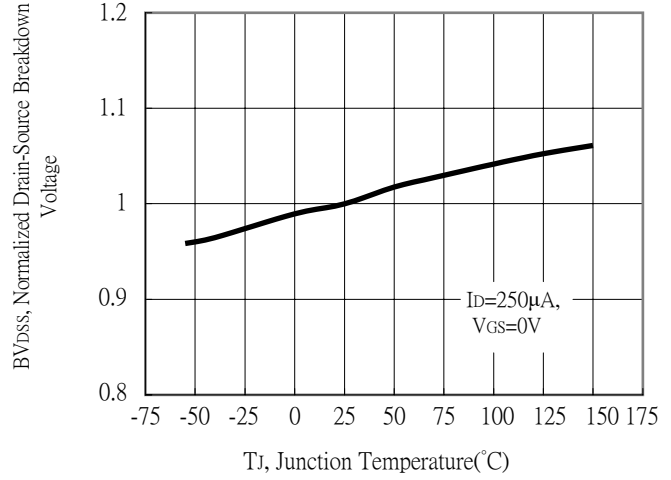
\*2. Independent of operating temperature

## Typical Characteristics

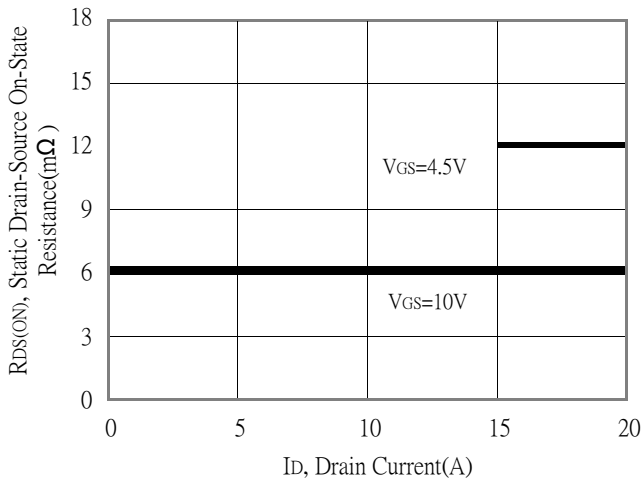
Typical Output Characteristics



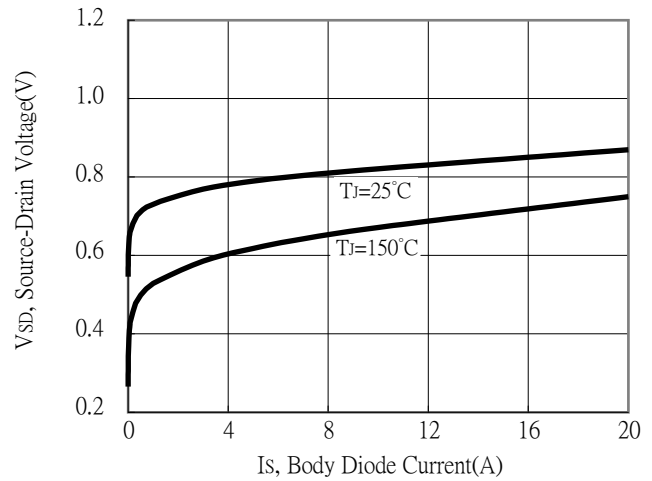
Brekdown Voltage vs Ambient Temperature



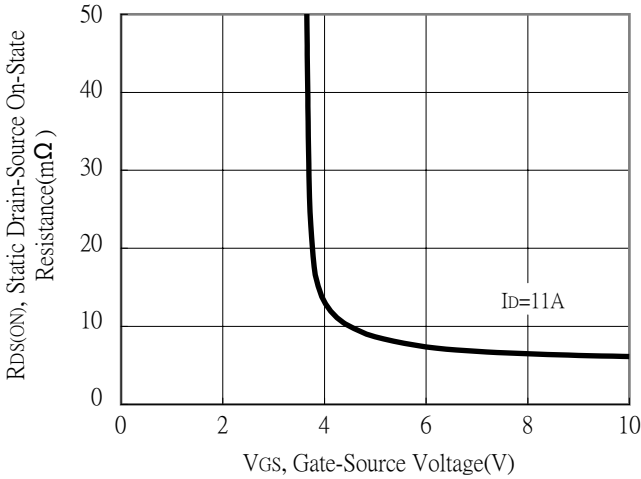
Static Drain-Source On-State resistance vs Drain Current



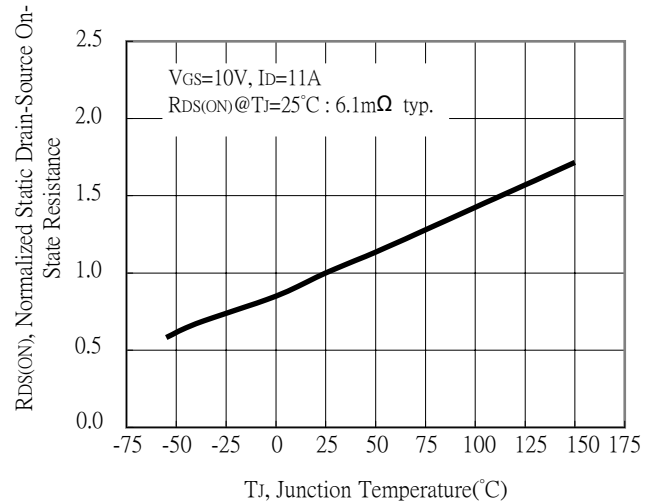
Body Diode Current vs Source-Drain Voltage



Static Drain-Source On-State Resistance vs Gate-Source Voltage

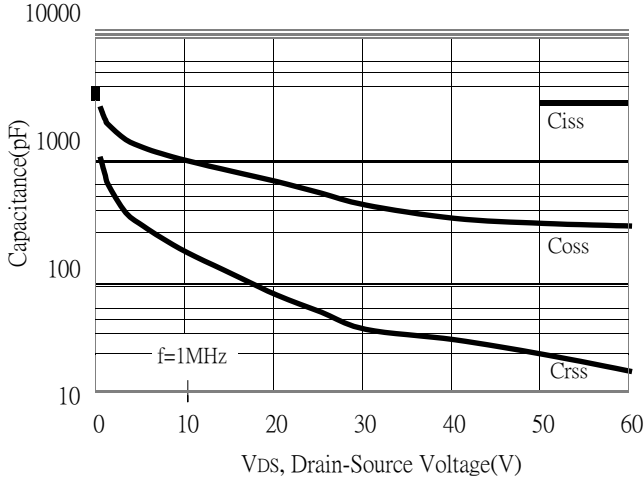


Drain-Source On-State Resistance vs Junction Temperature

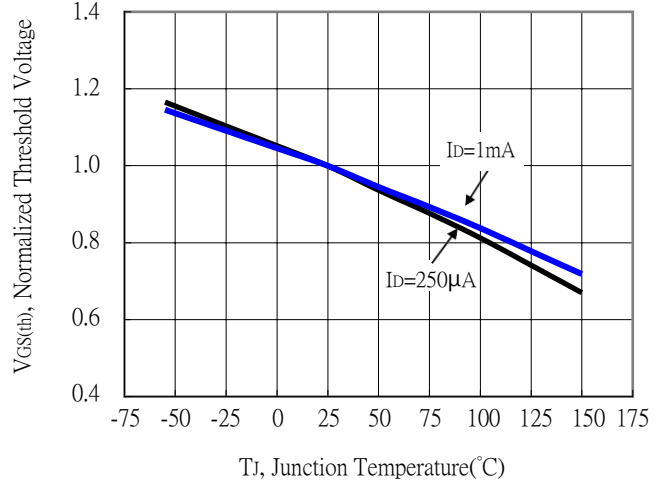


**Typical Characteristics (Cont.)**

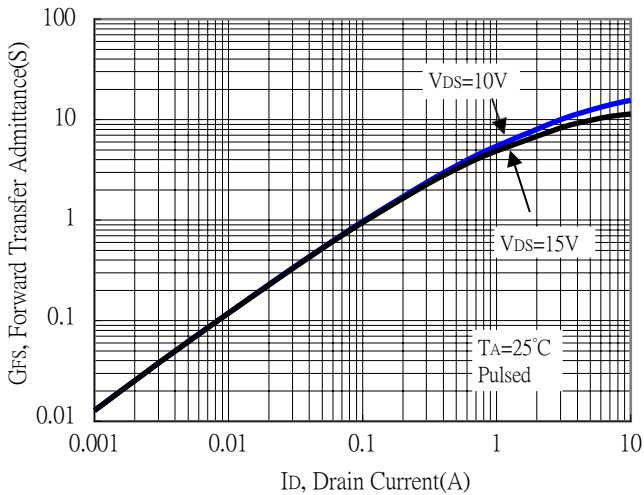
Capacitance vs Drain-to-Source Voltage



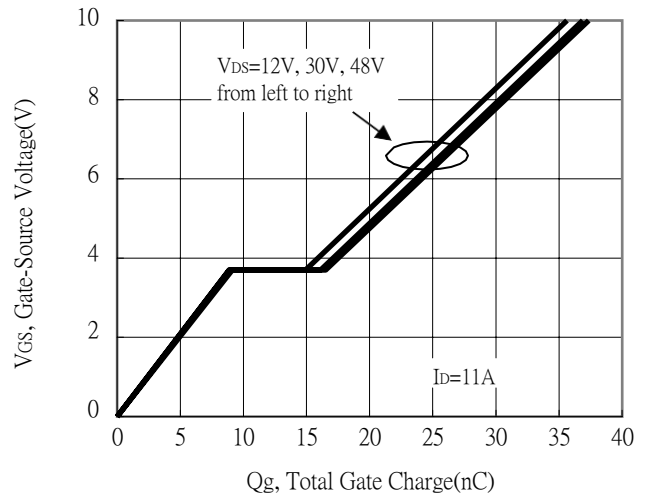
Threshold Voltage vs Junction Temperature



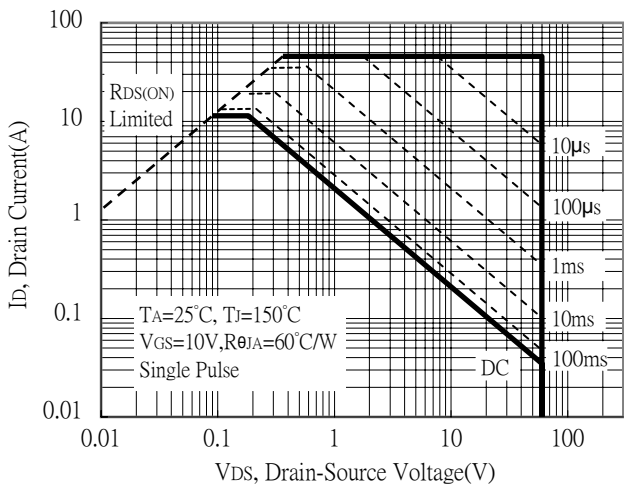
Forward Transfer Admittance vs Drain Current



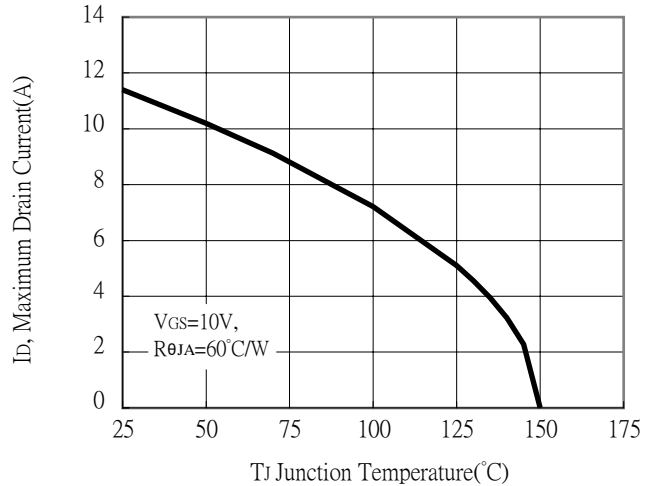
Gate Charge Characteristics



Maximum Safe Operating Area

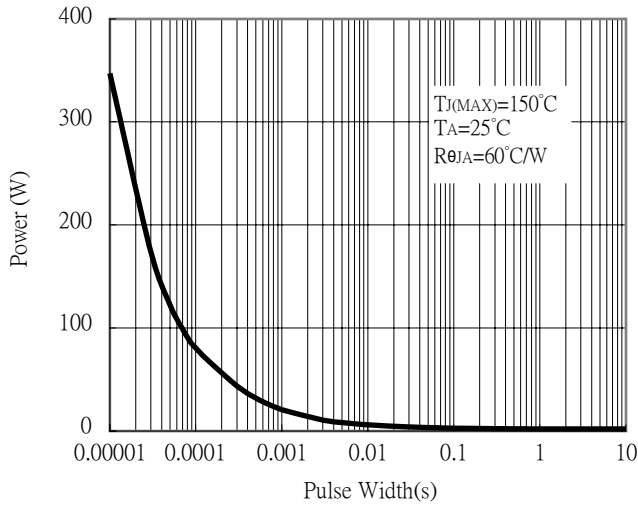


Maximum Drain Current vs Junction Temperature

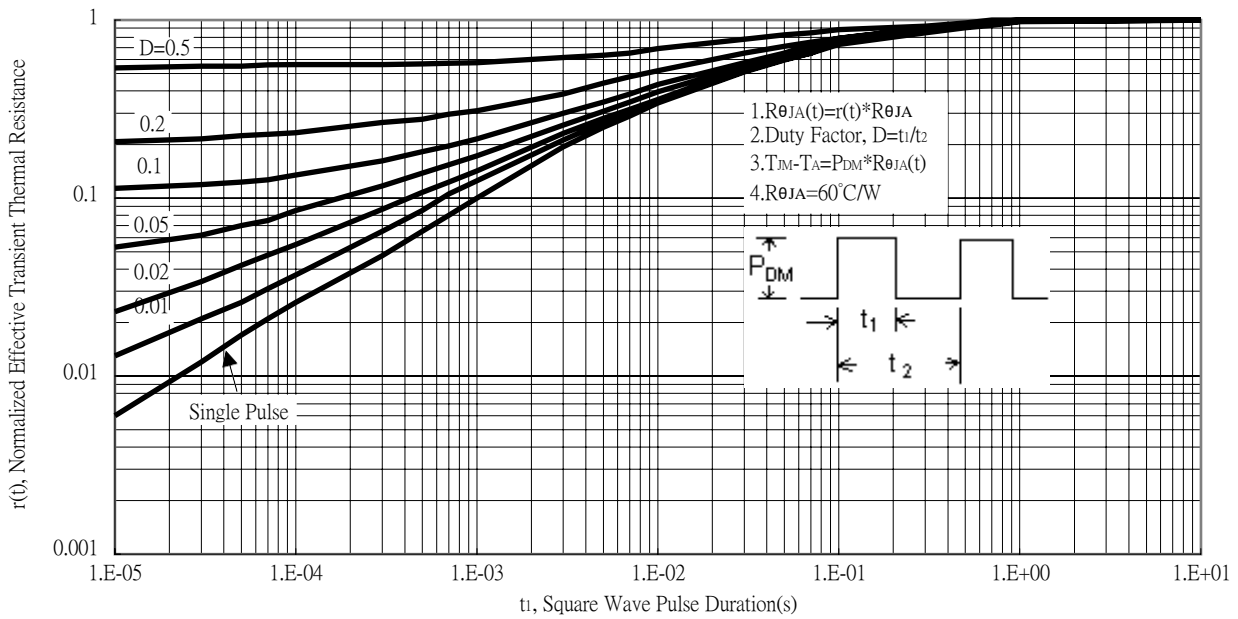


### Typical Characteristics (Cont.)

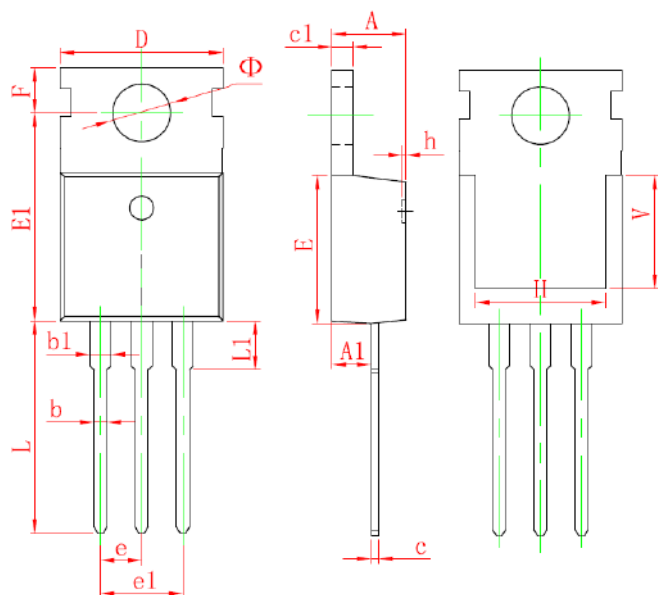
Single Pulse Power Rating, Junction to Ambient



Transient Thermal Response Curves

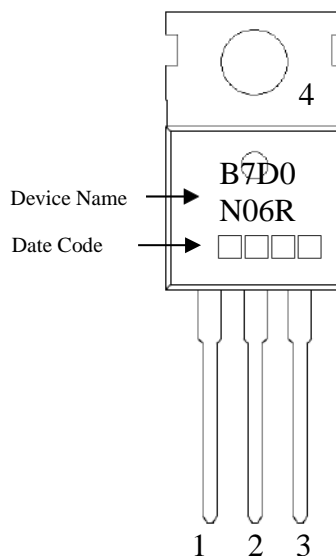


**TO-220 Dimension**



3-Lead TO-220 Plastic Package

Marking:



Style: Pin 1.Gate 2.Drain 3.Source  
 4.Drain

\*: Typical

DIM	Millimeters		Inches		DIM	Millimeters		Inches	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	4.400	4.600	0.173	0.181	e	2.540*		0.100*	
A1	2.250	2.550	0.089	0.100	e1	4.980	5.180	0.196	0.204
b	0.710	0.910	0.028	0.036	F	2.650	2.950	0.104	0.116
b1	1.170	1.370	0.046	0.054	H	7.900	8.100	0.311	0.319
c	0.330	0.650	0.013	0.026	h	0.000	0.300	0.000	0.012
c1	1.200	1.400	0.047	0.055	L	12.900	13.400	0.508	0.528
D	9.910	10.250	0.390	0.404	L1	2.850	3.250	0.112	0.128
E	8.950	9.750	0.352	0.384	V	7.500	REF	0.295	REF
E1	12.650	12.950	0.498	0.510	Φ	3.400	3.800	0.134	0.150