ELECTRICAL CHARACTERISTICS (T_J = 25°C unless otherwise noted)

Characteristic		Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain−to−Source Breakdown Voltage (V_{GS} = 0 Vdc, I_D = 0.25 mAdc)		$V_{(BR)DSS}$	100	—	—	Vdc
Temperature Coefficient (Positive)			—	116	—	mV/°C
Zero Gate Voltage Drain Current (V_{DS} = 100 Vdc, V_{GS} = 0 Vdc)		I_{DSS}	—	—	10	μAdc
(V_{DS} = 100 Vdc, V_{GS} = 0 Vdc, T_J = 125°C)			—	—	100	
Gate−Body Leakage Current (V_{GS} = ±20 Vdc, V_{DS} = 0 Vdc)		I_{GSS}	—	—	100	nAdc
ON CHARACTERISTICS[1]						
Gate Threshold Voltage (V_{DS} = V_{GS}, I_D = 250 μAdc)	Cpk ≥ 2.0[3]	$V_{GS(th)}$	2.0	2.9	4.0	Vdc
Threshold Temperature Coefficient (Negative)			—	6.8	—	mV/°C
Static Drain−to−Source On−Resistance (V_{GS} = 10 Vdc, I_D = 15 Adc)	Cpk ≥ 2.0[3]	$R_{DS(on)}$	—	0.047	0.070	Ohms
Drain−to−Source On−Voltage (V_{GS} = 10 Vdc, I_D = 27 Adc)		$V_{DS(on)}$	—	—	1.9	Vdc
(V_{GS} = 10 Vdc, I_D = 15 Adc, T_J = 125°C)			—	—	1.8	
Forward Transconductance (V_{DS} = 15 Vdc, I_D = 15 Adc)		g_{FS}	6.0	15	—	Mhos
DYNAMIC CHARACTERISTICS						
Input Capacitance	(V_{DS} = 25 Vdc, V_{GS} = 0 Vdc, f = 1.0 MHz)	C_{iss}	—	1460	1600	pF
Output Capacitance		C_{oss}	—	390	800	
Transfer Capacitance		C_{rss}		120	300	
SWITCHING CHARACTERISTICS[2]						
Turn−On Delay Time	(V_{DD} = 30 Vdc, I_D = 15 Adc, V_{GS} = 10 Vdc, R_G = 4.7 Ω)	$t_{d(on)}$	—	11.6	30	ns
Rise Time		t_r	—	50	60	
Turn−Off Delay Time		$t_{d(off)}$	—	26	80	
Fall Time		t_f	—	19	30	
Gate Charge (See Figure 8)	(V_{DS} = 80 Vdc, I_D = 27 Adc, V_{GS} = 10 Vdc)	Q_T	—	50	60	nC
		Q_1	—	9.0	—	
		Q_2	—	26	—	
		Q_3	—	20	—	
SOURCE−DRAIN DIODE CHARACTERISTICS						
Forward On−Voltage (I_S = 27 Adc, V_{GS} = 0 Vdc)		V_{SD}	—	0.93	2.4	Vdc
(I_S = 27 Adc, V_{GS} = 0 Vdc, T_J = 125°C)			—	0.84	—	
Reverse Recovery Time	(I_S = 27 Adc, V_{GS} = 0 Vdc, dI_S/dt = 100 A/μs)	t_{rr}	—	110	—	ns
		t_a	—	100	—	
		t_b	—	10	—	
Reverse Recovery Stored Charge		Q_{RR}	—	0.67	—	μC
INTERNAL PACKAGE INDUCTANCE						
Internal Drain Inductance (Measured from the contact screw on tab to center of die)		L_d	—	3.5	—	nH
(Measured from the drain lead 0.25″ from package to center of die)			—	4.5	—	
Internal Source Inductance (Measured from the source lead 0.25″ from package to source bond pad)		L_s	—	7.5	—	

(1) Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2%.
(2) Switching characteristics are independent of operating junction temperature.
(3) Reflects typical values. $Cpk = \left|\frac{\text{Max limit} - \text{Typ}}{3 \times \text{sigma}}\right|$

TYPICAL ELECTRICAL CHARACTERISTICS

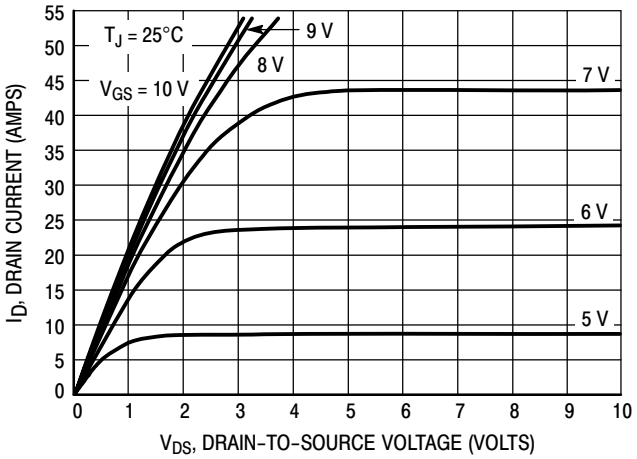


Figure 1. On−Region Characteristics

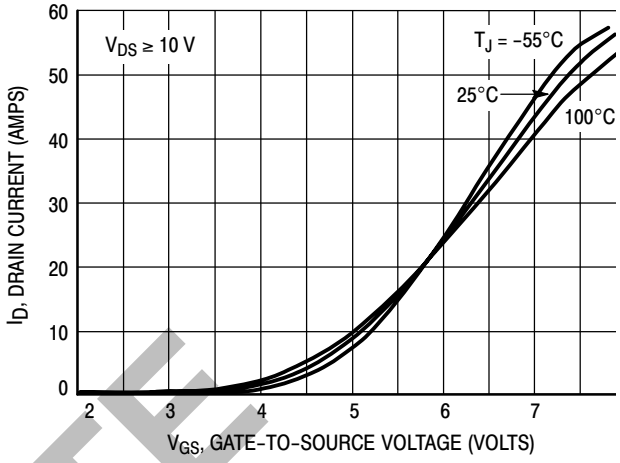


Figure 2. Transfer Characteristics

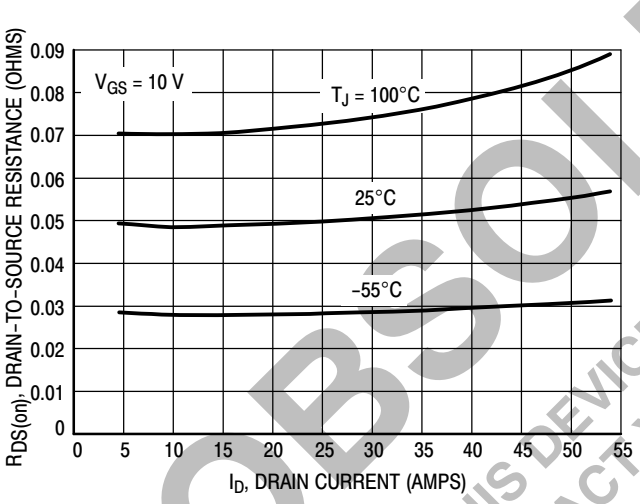


Figure 3. On−Resistance versus Drain Current and Temperature

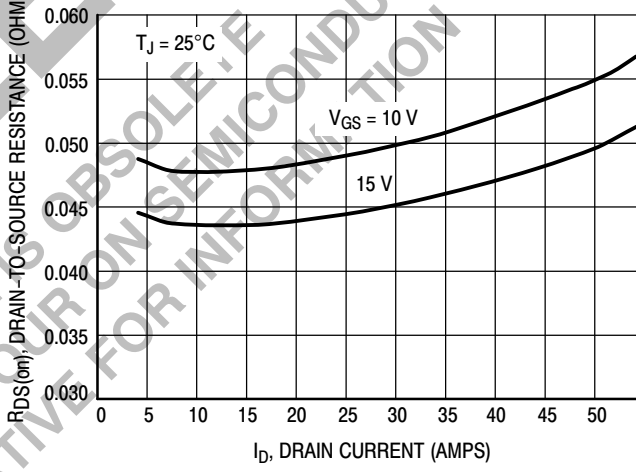


Figure 4. On−Resistance versus Drain Current and Gate Voltage

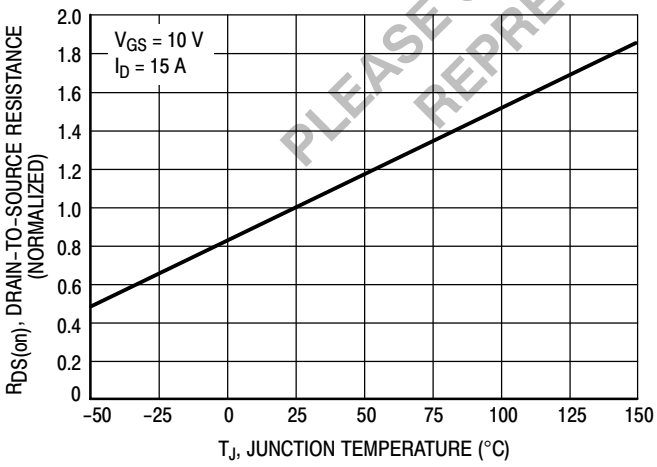


Figure 5. On−Resistance Variation with Temperature

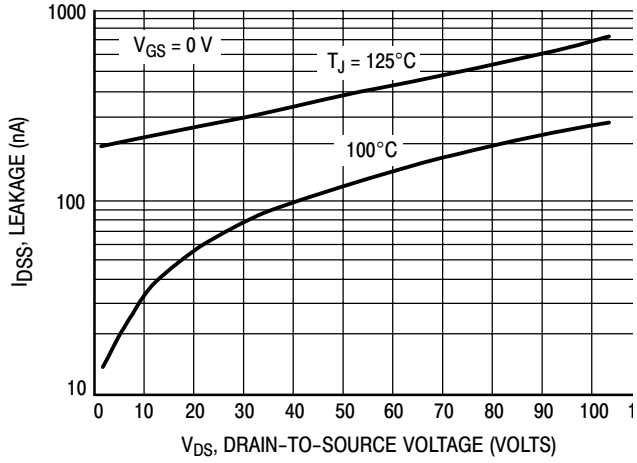


Figure 6. Drain−to−Source Leakage Current versus Voltage

TYPICAL ELECTRICAL CHARACTERISTICS

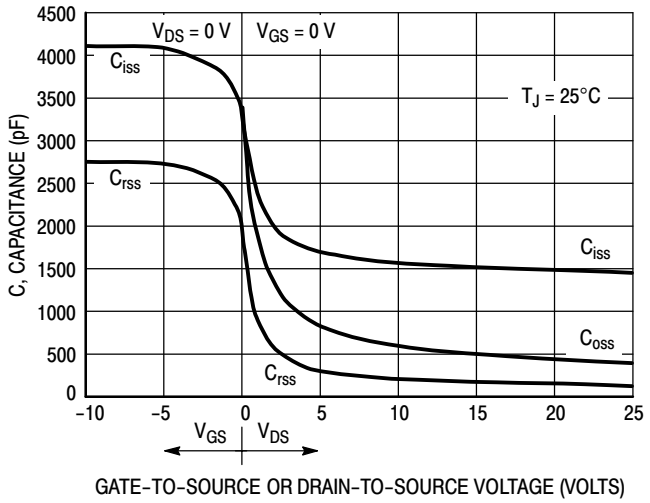


Figure 7. Capacitance Variation

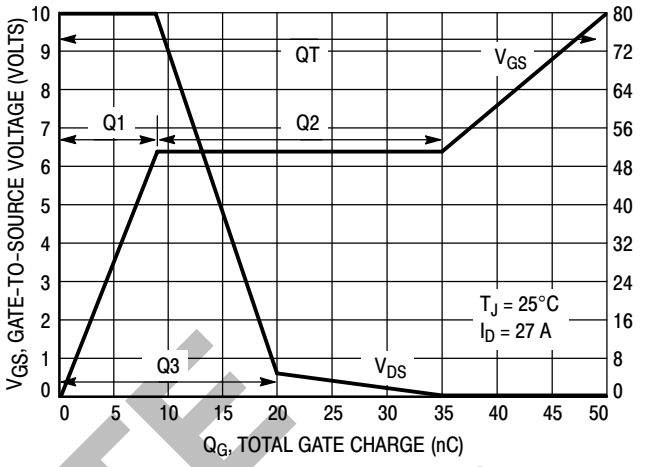


Figure 8. Gate−to−Source and Drain−to−Source Voltage versus Total Charge

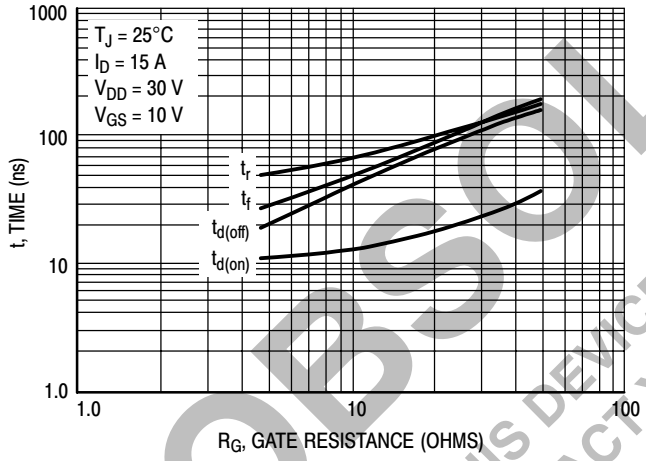


Figure 9. Resistive Switching Time Variation versus Gate Resistance

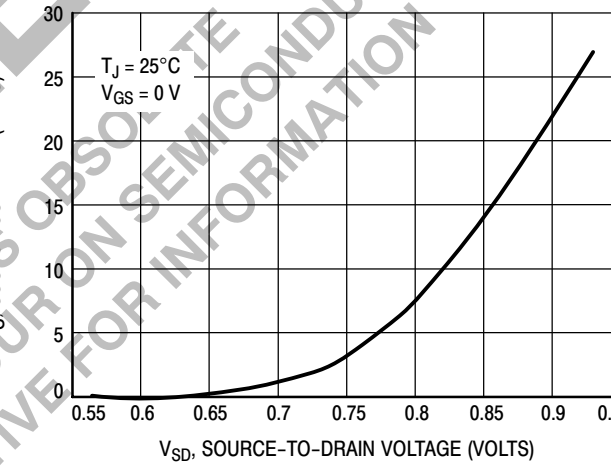


Figure 10. Diode Forward Voltage versus Current

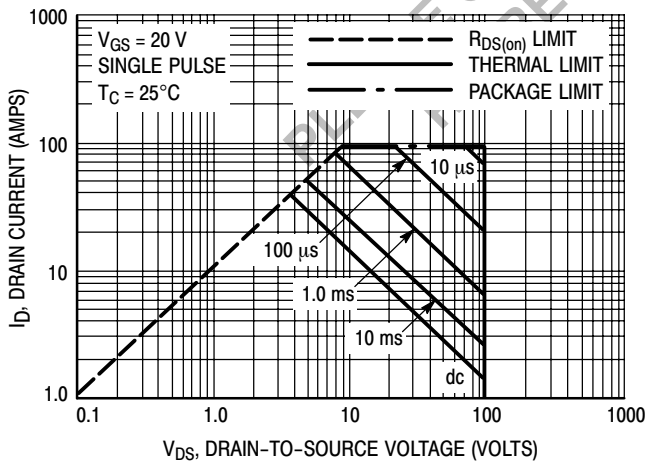


Figure 11. Maximum Rated Forward Biased Safe Operating Area

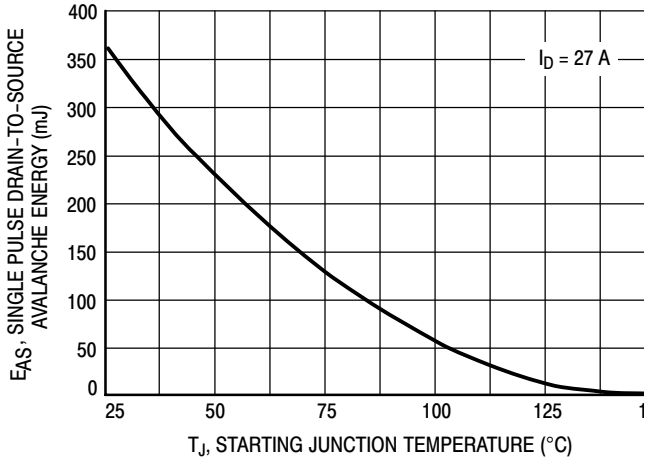


Figure 12. Maximum Avalanche Energy versus Starting Junction Temperature

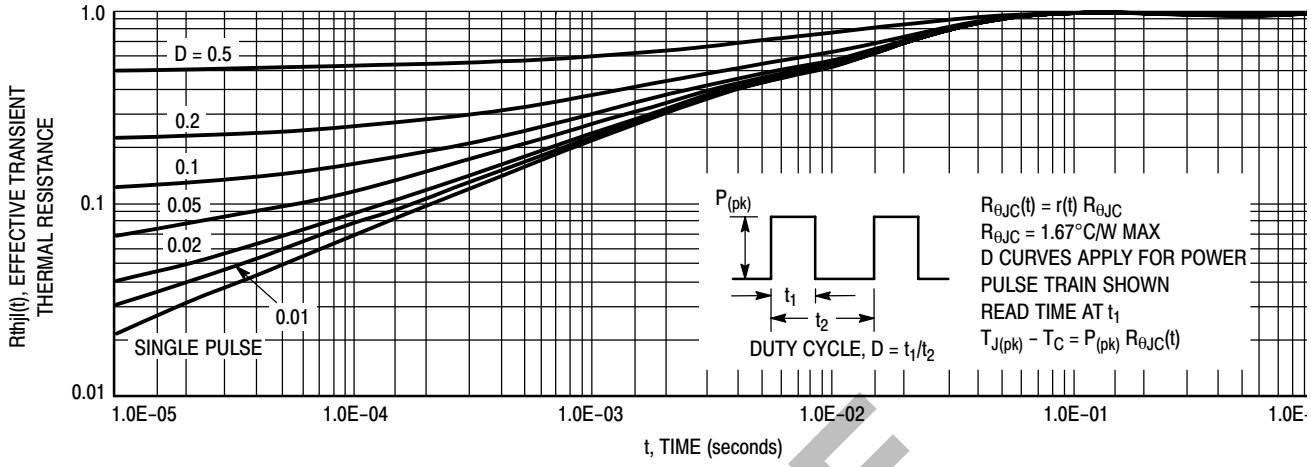
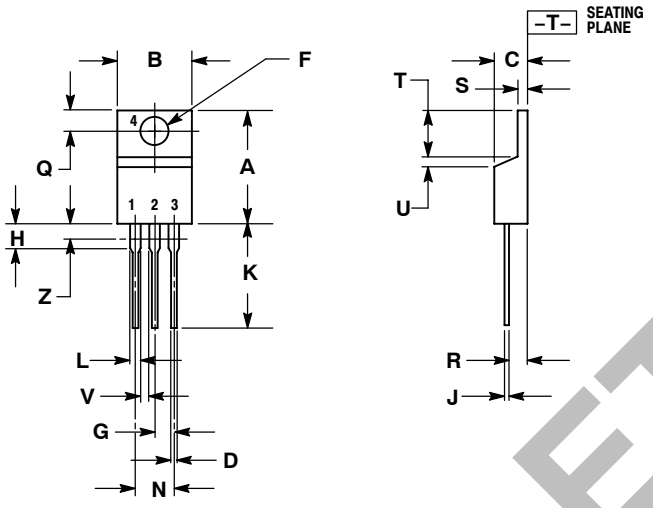


Figure 13. Thermal Response

PACKAGE DIMENSIONS

CASE 221A−09
(TO−220AB)
ISSUE Z



NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. DIMENSION Z DEFINES A ZONE WHERE ALL BODY AND LEAD IRREGULARITIES ARE ALLOWED.

	INCHES		MILLIMETERS	
DIM	MIN	MAX	MIN	MAX
A	0.570	0.620	14.48	15.75
B	0.380	0.405	9.66	10.28
C	0.160	0.190	4.07	4.82
D	0.025	0.035	0.64	0.88
F	0.142	0.147	3.61	3.73
G	0.095	0.105	2.42	2.66
H	0.110	0.155	2.80	3.93
J	0.018	0.025	0.46	0.64
K	0.500	0.562	12.70	14.27
L	0.045	0.060	1.15	1.52
N	0.190	0.210	4.83	5.33
Q	0.100	0.120	2.54	3.04
R	0.080	0.110	2.04	2.79
S	0.045	0.055	1.15	1.39
T	0.235	0.255	5.97	6.47
U	0.000	0.050	0.00	1.27
V	0.045	---	1.15	---
Z	---	0.080	---	2.04

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