2N6661

N-Channel Enhancement Mode
MOSPOWER

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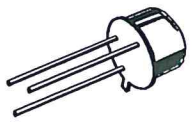
APPLICATIONS

- Switching Regulators
- Converters
- Motor Drivers

PRODUCT SUMMARY

Part Number	BV_{DSS} Volts	$r_{DS(ON)}$ (ohms)	Package
2N6661	90	4	TO–205AD

TO-39 (TO-205AD)



BOTTOM VIEW

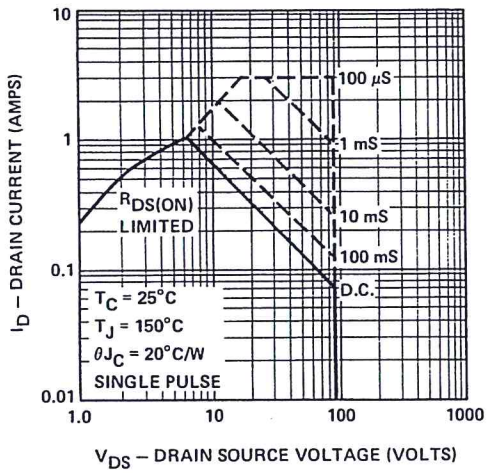
1 SOURCE
2 GATE
3 & CASE-DRAIN

ABSOLUTE MAXIMUM RATINGS (T_C = 25° C unless otherwise noted)

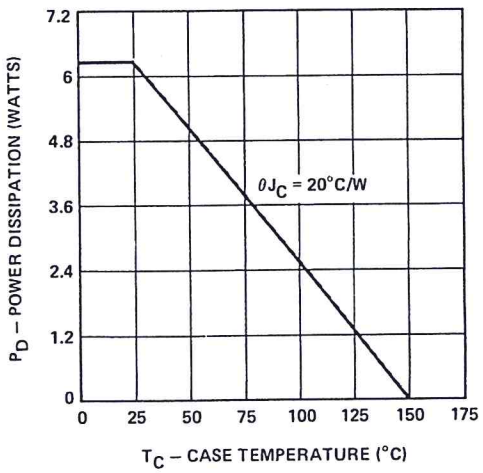
	Parameter	2N6661	Units
V_{DS}	Drain-Source Voltage	90	V
V_{DGR}	Drain-Gate Voltage (R_{GS} = 1 MΩ)	90	V
I_D @ T_C = 25° C	Continuous Drain Current	±0.9	A
I_D @ T_C = 100° C	Continuous Drain Current	±0.7	A
I_{DM}	Pulsed Drain Current[1]	±3	A
V_{GS}	Gate-Source Voltage	±40	V
P_D @ T_C = 25° C	Max. Power Dissipation	6.25	W
P_D @ T_C = 100° C	Max. Power Dissipation	2.5	W
Junction to Case	Linear Derating Factor	0.05	W/° C
Junction to Ambient	Linear Derating Factor	0.006	W/° C
T_J Tstg	Operating and Storage Temperature Range	–55 To +150	° C
Lead Temperature	(1/16" from case for 10 secs.)	300	° C

1 Pulse Test: Pulsewidth ≤ 300μsec, Duty Cycle ≤ 2%

Active Region



Power Derating



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

STATIC

Parameter		Type	Min.	Typ.	Max.	Units	Test Conditions
BV_{DSS}	Drain-Source Breakdown Voltage	2N6661	90	110		V	V_{GS} = 0 I_D = 10 μA
$V_{GS(th)}$	Gate-Threshold Voltage	2N6661	0.8	1.5	2	V	V_{DS} = V_{GS}, I_D = 1 mA
I_{GSSF}	Gate-Body Leakage Forward	2N6661		1 5	100 500	nA	V_{GS} = +15V, V_{DS} = 0 V_{GS}=+15V, V_{DS} = 0, T_A=125°C
I_{GSSR}	Gate-Body Leakage Reverse	2N6661		−1	−100	nA	V_{GS} = −15V, V_{DS} = 0
I_{DSS}	Zero Gate Voltage Drain Current	2N6661		1	10	μA	V_{DS} = Max. Rating, V_{GS} = 0
		2N6661		50	500	μA	V_{DS} = 0.8 Max. Rating, V_{GS} = 0 T_C = 125°C
$I_{D(on)}$	On-State Drain Current[1]	2N6661	1.5	1.7		A	V_{DS}≥2$V_{DS(ON)}$, V_{GS} = 10V
$V_{DS(on)}$	Static Drain-Source On-State Voltage[1]	2N6661		1.2	1.6	V	V_{GS} = 5V , I_D = 0.3A
		2N6661		3	4	V	V_{GS} = 10V , I_D = 1A
$R_{DS(on)}$	Static Drain-Source On-State Resistance[1]	2N6661		4	5.3	Ω	V_{GS} = 5V , I_D = 0.3A
		2N6661		3	4	Ω	V_{GS} = 10V , I_D = 1A
$R_{DS(on)}$	Static Drain-Source On-State Resistance[1]	2N6661		4.1	5.5	Ω	V_{GS} =10V, I_D =1A , T_C =125°C

DYNAMIC

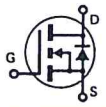
g_{fs}	Forward Transductance[1]	2N6661	170	195		mS (m℧)	V_{DS}≥2$V_{DS(ON)}$, I_D = 0.5A
C_{iss}	Input Capacitance	2N6661		35	50	pF	V_{GS} = 0 , V_{DS} = 25V f = 1 MHz
C_{oss}	Output Capacitance	2N6661		33	40	pF	
C_{rss}	Reverse Transfer Capacitance	2N6661		2	10	pF	
$t_{d(on)}$	Turn-On Delay Time	2N6661		8	10	ns	V_{DD} = 25V , I_D ≅ 1A R_g = 25Ω , R_L = 23Ω (MOSFET switching times are essentially independent of operating temperature.)
$t_{d(off)}$	Turn-Off Delay Time	2N6661		8	10	ns	

THERMAL RESISTANCE

R_{thJC}	Junction-to-Case	2N6661			20	°C/W	
R_{thJA}	Junction-to-Ambient	2N6661			170	°C/W	Free Air Operation

BODY-DRAIN DIODE RATINGS AND CHARACTERISTICS

I_S	Continuous Source Current (Body Diode)	2N6661			−0.9	A	Modified MOSPOWER symbol showing the integral P-N Junction rectifier
I_{SM}	Source Current[1] (Body Diode)	2N6661			−3	A	
V_{SD}	Diode Forward Voltage[1]	2N6661		−1.2		V	T_C=25°C, I_S=−0.9A, V_{GS} = 0



1 **Pulse Test:** Pulse Width ≤ 300 μsec, Duty Cycle ≤ 2%

TYPICAL PERFORMANCE CURVES (25° C unless otherwise noted)

FIGURE 1. Ohmic Region

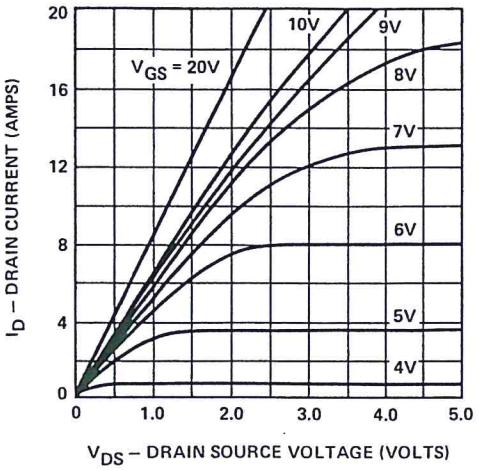


FIGURE 2. Transfer Characteristics

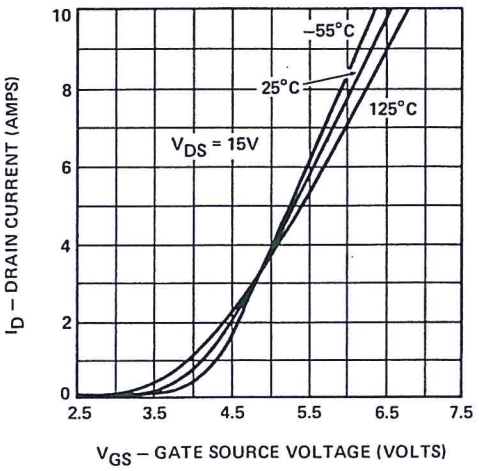


FIGURE 3. Temperature Effects on $r_{DS(on)}$

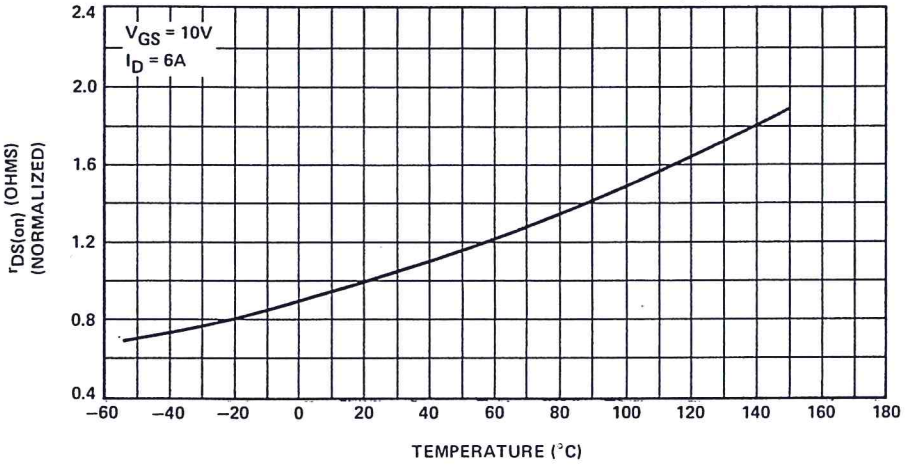


FIGURE 4. Output Characteristics

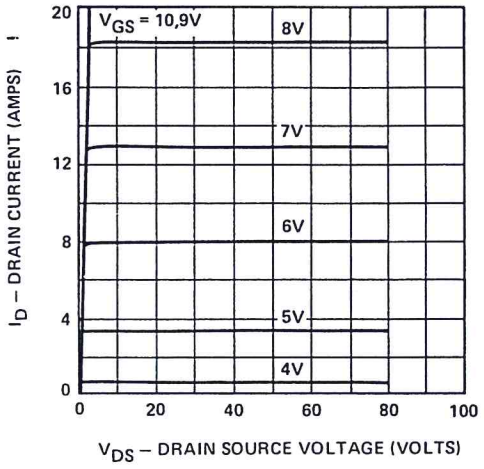
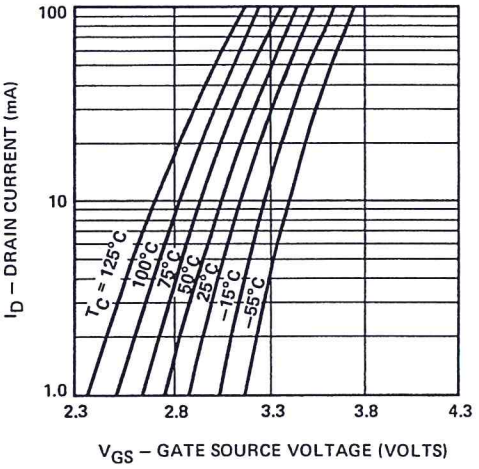


FIGURE 5. Threshold Region



TYPICAL PERFORMANCE CURVES—Continued

FIGURE 6. Off-State Current

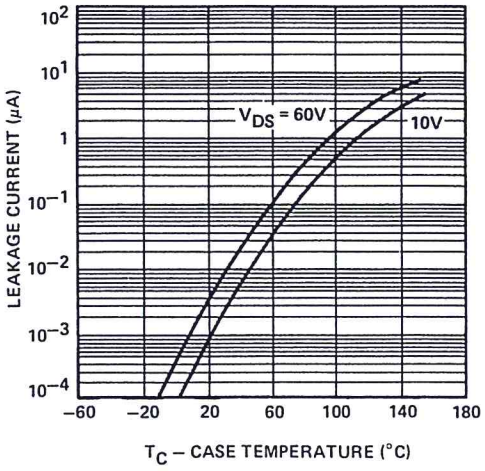


FIGURE 7. Capacitance

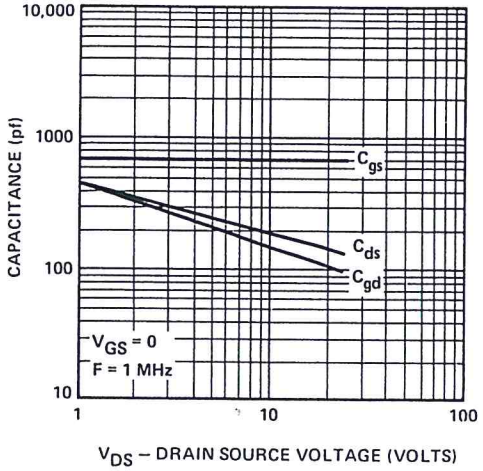


FIGURE 8. Effects on Load Conditions

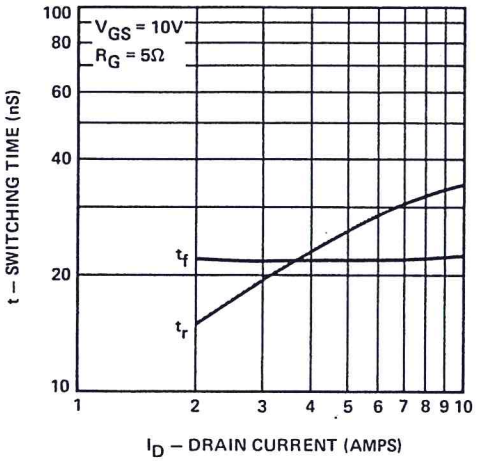


FIGURE 9. Effects of Drive Resistance

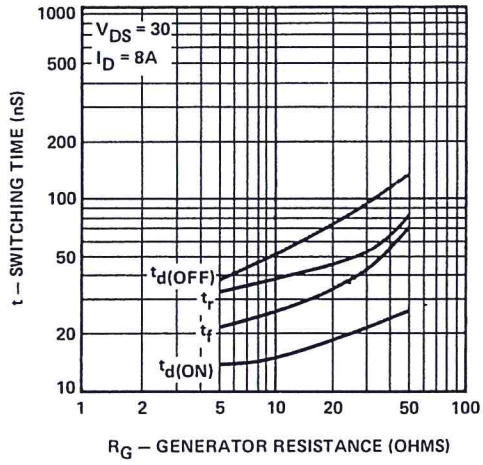
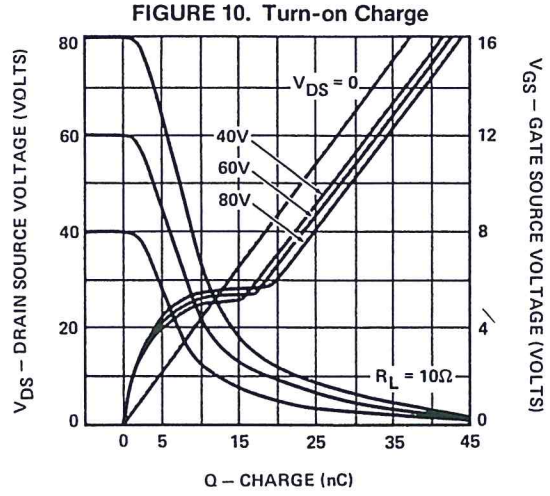
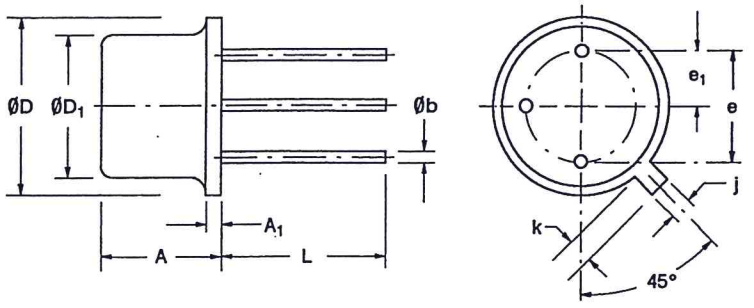


FIGURE 10. Turn-on Charge



TRANSIENT THERMAL RESPONSE CURVES

TO-39 (TO-205AD)



DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	6.10	6.60	0.240	0.260
A_1	0.23	1.04	0.009	0.041
Øb	0.41	0.53	0.016	0.021
ØD	8.51	9.39	0.335	0.370
$ØD_1$	7.75	8.51	0.305	0.335
e	5.08 BSC		0.200 BSC	
e_1	2.54 BSC		0.100 BSC	
j	0.72	0.86	0.028	0.034
k	0.74	1.14	0.029	0.045
L	12.70	19.05	0.500	0.750

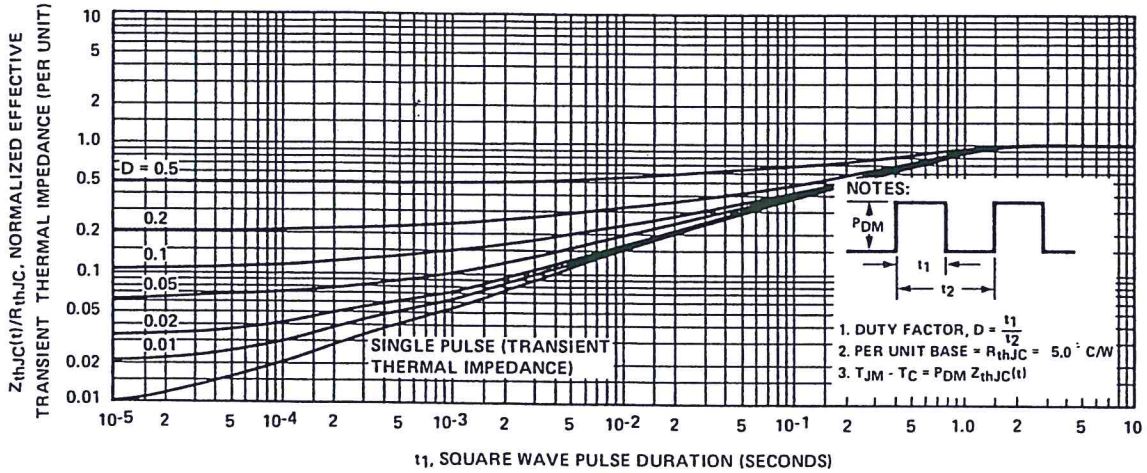


FIGURE 3. TO-39 Package