

2N6660



SOLID STATE INC.

46 FARRAND STREET  
BLOOMFIELD, NEW JERSEY 07003

www.solidstateinc.com

N-Channel Enhancement Mode  
**MOSPOWER**

**APPLICATIONS**

- Switching Regulators
- Converters
- Motor Drivers

**PRODUCT SUMMARY**

Part Number	BV <sub>DSS</sub> Volts	r <sub>DS(ON)</sub> (ohms)	Package
2N6660	60	3	T0-205AF

PIN 1 – Source  
PIN 2 – Gate  
PIN 3 & CASE – Drain



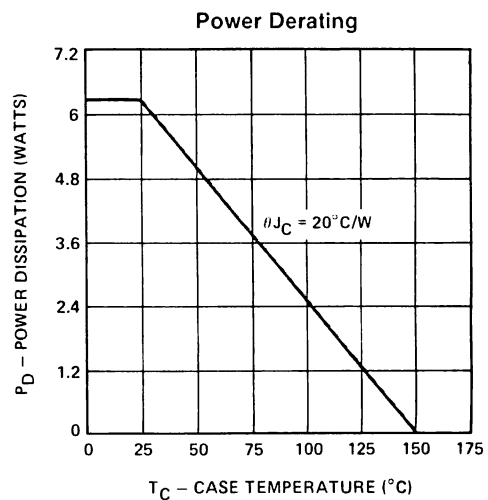
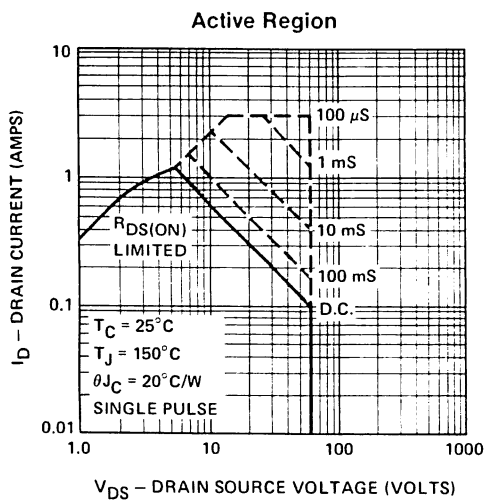
T0-205AF (T0-39)

For Additional Curves  
See Section 5: VNMA06

**ABSOLUTE MAXIMUM RATINGS (T<sub>C</sub> = 25° C unless otherwise noted)**

Parameter	2N6660	Units
V <sub>DS</sub> Drain-Source Voltage	60	V
V <sub>DGR</sub> Drain-Gate Voltage (R <sub>GS</sub> = 1 MΩ)	60	V
I <sub>D</sub> @ T <sub>C</sub> = 25° C Continuous Drain Current	±1.1	A
I <sub>D</sub> @ T <sub>C</sub> = 100° C Continuous Drain Current	±0.8	A
I <sub>DM</sub> Pulsed Drain Current <sup>1</sup>	±3	A
V <sub>GS</sub> Gate-Source Voltage	±40	V
P <sub>D</sub> @ T <sub>C</sub> = 25° C Max. Power Dissipation	6.25	W
P <sub>D</sub> @ T <sub>C</sub> = 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 <sub>J</sub> Operating and	-55 To +150	° C
T <sub>stg</sub> Storage Temperature Range		
Lead Temperature (1/16" from case for 10 secs.)	300	° C

<sup>1</sup> Pulse Test: Pulsewidth ≤ 300μsec, Duty Cycle ≤ 2%



# ELECTRICAL CHARACTERISTICS ( $T_C = 25^\circ\text{C}$ unless otherwise noted)

## STATIC

Parameter	Type	Min.	Typ.	Max.	Units	Test Conditions
$BV_{DSS}$ Drain-Source Breakdown Voltage	2N6660	60	100		V	$V_{GS} = 0$ $I_D = 10\ \mu\text{A}$
$V_{GS(th)}$ Gate-Threshold Voltage	2N6660	0.8	1.5	2	V	$V_{DS} = V_{GS}, I_D = 1\ \text{mA}$
$I_{GSSF}$ Gate-Body Leakage Forward	2N6660		1 5	100 500	nA	$V_{GS} = +15\text{V}, V_{DS} = 0$ $V_{GS} = +15\text{V}, V_{DS} = 0, T_A = 125^\circ\text{C}$
$I_{GSSR}$ Gate-Body Leakage Reverse	2N6660		-1	-100	nA	$V_{GS} = -15\text{V}, V_{DS} = 0$
$I_{DSS}$ Zero Gate Voltage Drain Current	2N6660		1	10	$\mu\text{A}$	$V_{DS} = \text{Max. Rating}, V_{GS} = 0$
	2N6660		50	500	$\mu\text{A}$	$V_{DS} = 0.8\ \text{Max. Rating}, V_{GS} = 0$ $T_C = 125^\circ\text{C}$
$I_{D(on)}$ On-State Drain Current <sup>1</sup>	2N6660	1.5	1.7		A	$V_{DS} \geq 2V_{DS(ON)}, V_{GS} = 10\text{V}$
$V_{DS(on)}$ Static Drain-Source On-State Voltage <sup>1</sup>	2N6660		1.4	1.5	V	$V_{GS} = 5\text{V}, I_D = 0.3\text{A}$
	2N6660		2.7	3	V	$V_{GS} = 10\text{V}, I_D = 1\text{A}$
$R_{DS(on)}$ Static Drain-Source On-State Resistance <sup>1</sup>	2N6660		4.7	5	$\Omega$	$V_{GS} = 5\text{V}, I_D = 0.3\text{A}$
	2N6660		2.7	3	$\Omega$	$V_{GS} = 10\text{V}, I_D = 1\text{A}$
$R_{DS(on)}$ Static Drain-Source On-State Resistance <sup>1</sup>	2N6660		3.9	4.2	$\Omega$	$V_{GS} = 10\text{V}, I_D = 1\text{A}, T_C = 125^\circ\text{C}$

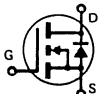
## DYNAMIC

$g_{fs}$ Forward Transconductance <sup>1</sup>	2N6660	170	195		mS	$V_{DS} = 25\text{V}, I_D = 0.5\text{A}$
$C_{iss}$ Input Capacitance	2N6660		35	50	pF	$V_{GS} = 0, V_{DS} = 25\text{V}$ $f = 1\ \text{MHz}$
$C_{oss}$ Output Capacitance	2N6660		33	40	pF	
$C_{rss}$ Reverse Transfer Capacitance	2N6660		2	10	pF	
$t_{ON}$ Turn-On Time	2N6660		8	10	ns	$V_{DD} = 25\text{V}, I_D \cong 1\text{A}$ $R_g = 25\ \Omega, R_L = 23\ \Omega$ (MOSFET switching times are essentially independent of operating temperature.)
$t_{OFF}$ Turn-Off Time	2N6660		8	10	ns	

## THERMAL RESISTANCE

$R_{thJC}$ Junction-to-Case	2N6660			20	$^\circ\text{C/W}$	
$R_{thJA}$ Junction-to-Ambient	2N6660			170	$^\circ\text{C/W}$	Free Air Operation

## BODY-DRAIN DIODE RATINGS AND CHARACTERISTICS

$I_S$ Continuous Source Current (Body Diode)	2N6660			-1.1	A	Modified MOSPOWER symbol showing the integral P-N Junction rectifier 
$I_{SM}$ Source Current <sup>1</sup> (Body Diode)	2N6660			-3	A	
$V_{SD}$ Diode Forward Voltage <sup>1</sup>	2N6660		-0.9		V	$T_C = 25^\circ\text{C}, I_S = -1.1\text{A}, V_{GS} = 0$

<sup>1</sup> Pulse Test: Pulse Width  $\leq 300\ \mu\text{sec}$ , Duty Cycle  $\leq 2\%$

# TYPICAL PERFORMANCE CURVES (25° C unless otherwise noted)

FIGURE 1. Ohmic Region

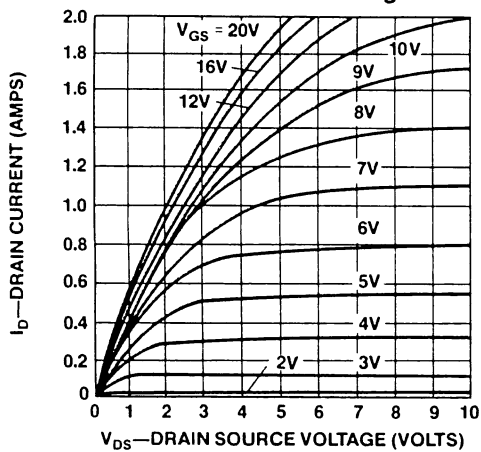


FIGURE 2. Transfer Characteristics

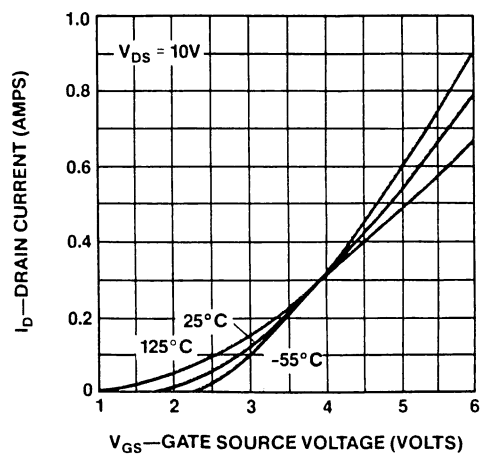


FIGURE 3. Temperature Effects on  $r_{DS(on)}$

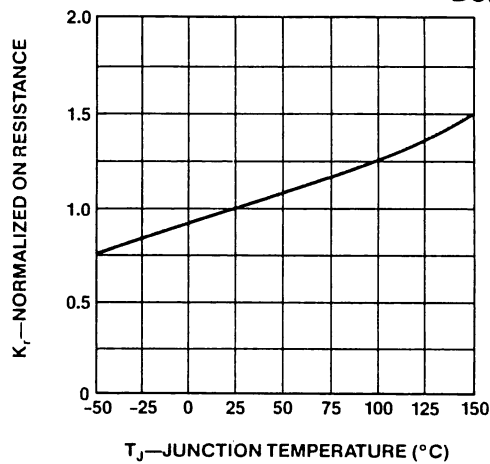


FIGURE 4. Threshold Region

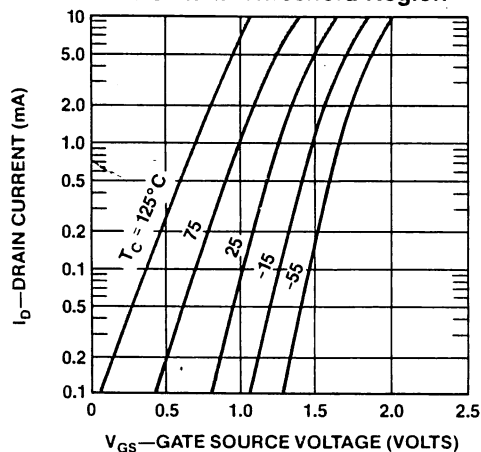
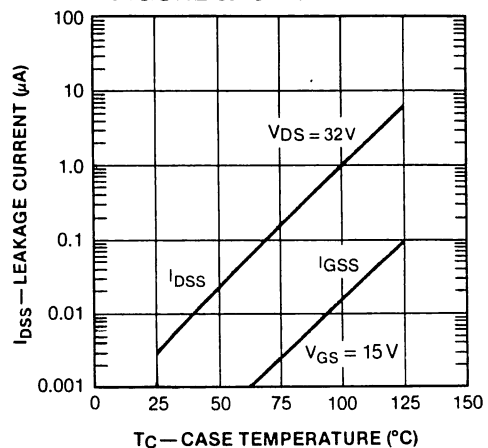


FIGURE 5. Off-State Current



# TRANSIENT THERMAL RESPONSE CURVES

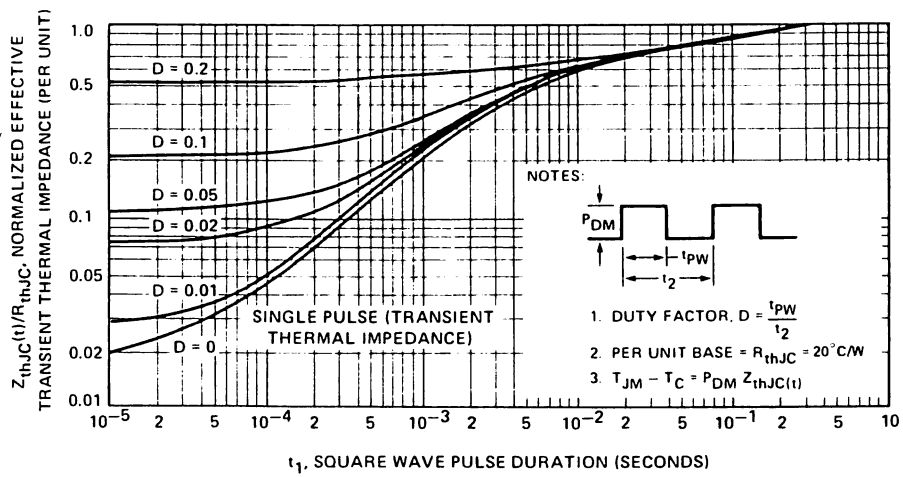
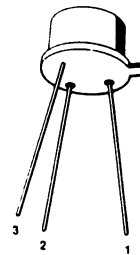
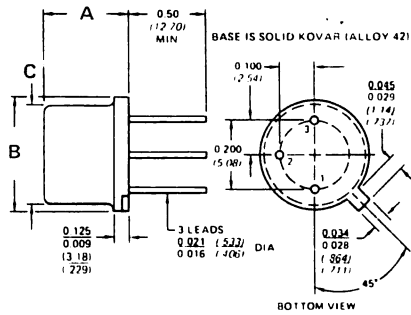


FIGURE 1. TO-39 Package

**TO-205 (TO-39)  
PACKAGE SUFFIX B**



All Dimensions in Inches  
(All Dimensions in Millimeters)

Package	Dimension		
	A	B	C
TO-205AD	0.260 (6.60)	0.370 (9.39)	0.335 (8.50)
	0.240 (6.10)	0.335 (8.51)	0.305 (7.75)
TO-205AF	0.180 (4.57)	0.370 (9.39)	0.355 (9.01)
	0.160 (4.07)	0.340 (8.64)	0.315 (8.01)