

ADVANCED POWER TECHNOLOGY®

2N7227 400 Volt 0.315Ω
JX2N7227*
JV2N7227*

POWER MOS IV™

*QUALIFIED TO MIL-S-19500/592 31/7/92

JEDEC REGISTERED N-CHANNEL HIGH VOLTAGE POWER MOSFETS

MAXIMUM RATINGS All Ratings: T_C = 25°C unless otherwise specified.

Symbol	Parameter	2N7227	UNIT
V_{DSS}	Drain-Source Voltage	400	Volts
V_{GS}	Gate-Source Voltage	±20	
I_D	Continuous Drain Current @ T_C = 25°C	14	Amps
	Continuous Drain Current @ T_C = 100°C	9	
I_{DM}	Pulsed Drain Current ①	56	
I_{AR}	Avalanche Current ①	14	
P_D	Total Power Dissipation @ T_C = 25°C	150	Watts
	Total Power Dissipation @ T_C = 100°C	60	
	Linear Derating Factor	1.2	W/K
E_{AS}	Single Pulse Avalanche Energy	700	mJ
E_{AR}	Repetitive Avalanche Energy	15	
T_J,T_{STG}	Operating and Storage Junction Temperature Range	-55 to 150	°C
T_L	Max. Lead Temp. for Soldering Conditions: 0.063" from Case for 10 Sec.	300	

STATIC ELECTRICAL CHARACTERISTICS

Symbol	Characteristic / Test Conditions	MIN	TYP	MAX	UNIT
BV_{DSS}	Drain-Source Breakdown Voltage (V_{GS} = 0V, I_D = 250μA)	400			Volts
$V_{GS}(TH)$	Gate Threshold Voltage (V_{DS} = V_{GS}, I_D = 250μA)	2		4	
I_{DSS}	Zero Gate Voltage Drain Current (V_{DS} = 0.8 V_{DSS}, V_{GS} = 0V)			25	μA
	Zero Gate Voltage Drain Current (V_{DS} = 0.8 V_{DSS}, V_{GS} = 0V, T_C = 125°C)			250	
I_{GSS}	Gate-Source Leakage Current (V_{GS} = ±20V, V_{DS} = 0V)			±100	nA
$I_D(ON)$	On State Drain Current ② (V_{DS} > $I_D(ON)$ x $R_{DS}(ON)$ Max, V_{GS} = 10V)	14			Amps
$R_{DS}(ON)$	Drain-Source On-State Resistance ② (V_{GS} = 10V, I_D = 9.0A)			0.315	Ohms
	Drain-Source On-State Resistance ② (V_{GS} = 10V, I_D = 9.0A, T_C = 125°C)			0.680	
	Drain-Source On-State Resistance ② (V_{GS} = 10V, I_D = 14.0A)			0.415	

Avalanche Rated

CAUTION: These Devices are Sensitive to Electrostatic Discharge. Proper Handling Procedures Should Be Followed.

APT Website - http://www.advancedpower.com

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051-4015 Rev D

DYNAMIC CHARACTERISTICS

2N7227

Symbol	Characteristic	Test Conditions	MIN	TYP	MAX	UNIT
C_{DC}	Drain-to-Case Capacitance	f = 1 MHz		12	24	pF
C_{iss}	Input Capacitance	V_{GS} = 0V V_{DS} = 25V f = 1 MHz		2400	2800	
C_{oss}	Output Capacitance			385	540	
C_{rss}	Reverse Transfer Capacitance			160	240	
Q_g	Total Gate Charge	V_{GS} = 10V V_{DD} = 0.5 V_{DSS} I_D = I_D [Cont.] @ 25°C		100	150	nC
Q_{gs}	Gate-Source Charge			12	24	
Q_{gd}	Gate-Drain ("Miller") Charge			41	65	
t_d(on)	Turn-on Delay Time	V_{GS} = 10V V_{DD} = 0.5 V_{DSS} I_D = I_D [Cont.] @ 25°C R_G = 2.35Ω		12	35	ns
t_r	Rise Time			18	190	
t_d(off)	Turn-off Delay Time			40	170	
t_f	Fall Time			13	130	

SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

Symbol	Characteristic / Test Conditions	MIN	TYP	MAX	UNIT
I_S	Continuous Source Current (Body Diode)			14	Amps
I_{SM}	Pulsed Source Current ① (Body Diode)			56	
V_{SD}	Diode Forward Voltage ② (V_{GS} = 0V, I_S = -I_D [Cont.])			1.7	Volts
t_{rr}	Reverse Recovery Time (I_S = -I_D [Cont.], dI_S/dt = 100A/µs)		279	1200	ns
Q_{rr}	Reverse Recovery Charge (I_S = -I_D [Cont.], dI_S/dt = 100A/µs)		3.6	9.0	µC

THERMAL CHARACTERISTICS

Symbol	Characteristic	MIN	TYP	MAX	UNIT
$R_{\theta JC}$	Junction to Case			0.83	K/W③
$R_{\theta JA}$	Junction to Ambient			31	

①Repetitive Rating: Pulse width limited by maximum junction temperature. See Transient Thermal Impedance Curve. (Fig.1)

②Pulse Test: Pulse width < 380 µS, Duty Cycle < 2%

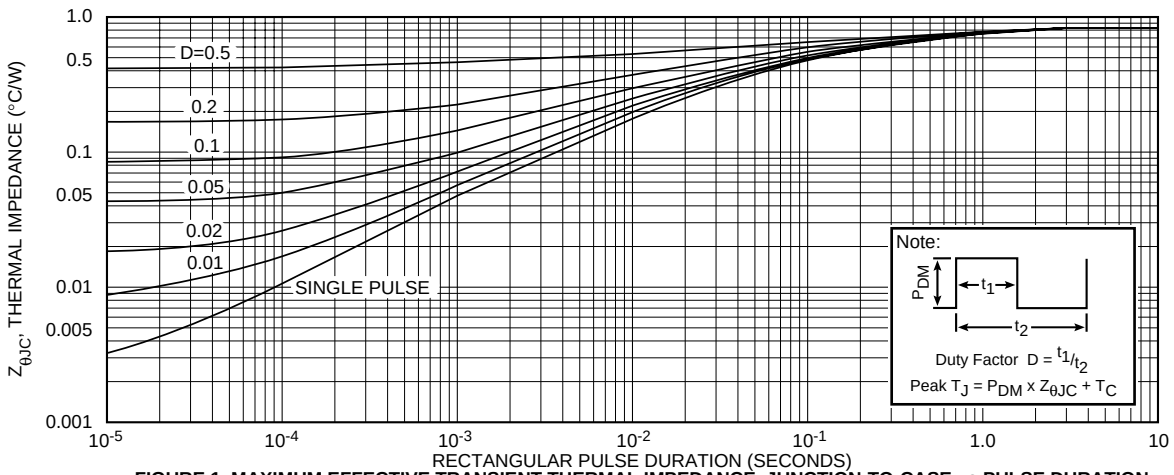


FIGURE 1, MAXIMUM EFFECTIVE TRANSIENT THERMAL IMPEDANCE, JUNCTION-TO-CASE vs PULSE DURATION

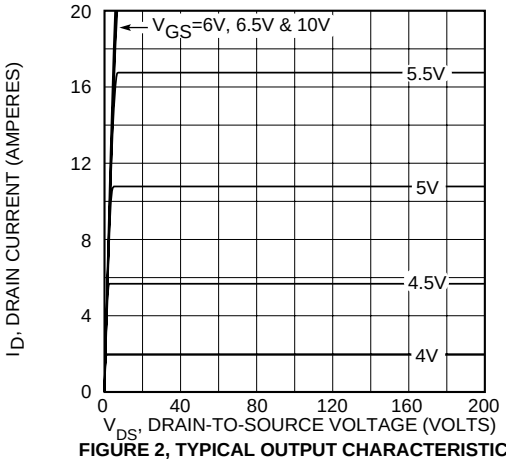


FIGURE 2, TYPICAL OUTPUT CHARACTERISTICS

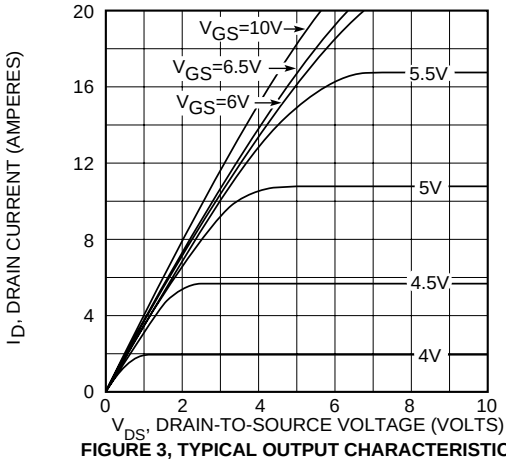


FIGURE 3, TYPICAL OUTPUT CHARACTERISTICS

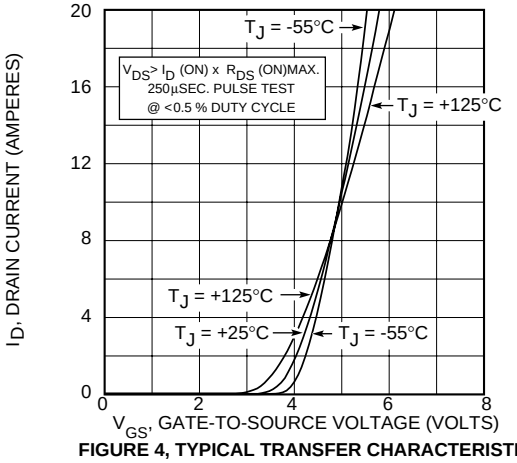


FIGURE 4, TYPICAL TRANSFER CHARACTERISTICS

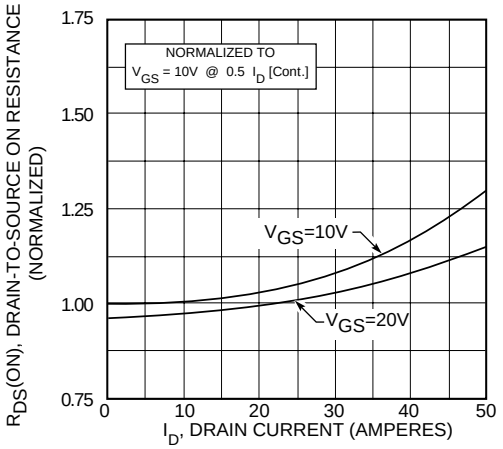


FIGURE 5, R_{DS}(ON) vs DRAIN CURRENT

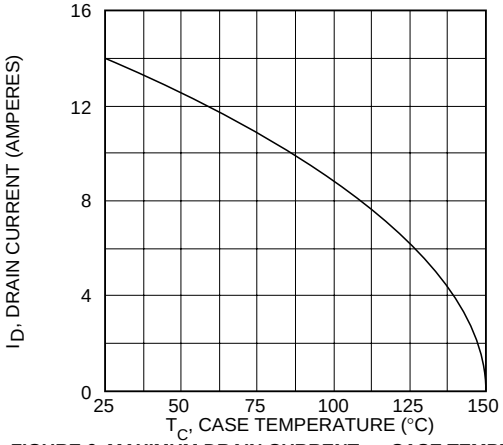


FIGURE 6, MAXIMUM DRAIN CURRENT vs CASE TEMPERATURE

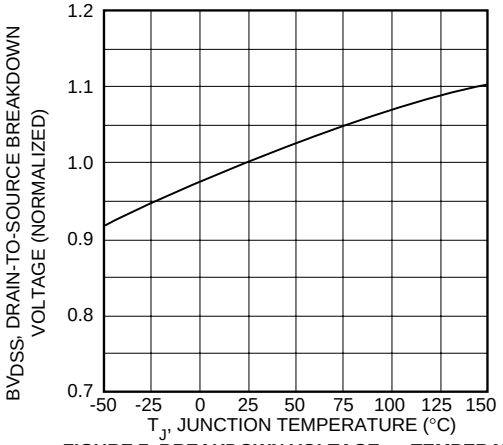


FIGURE 7, BREAKDOWN VOLTAGE vs TEMPERATURE

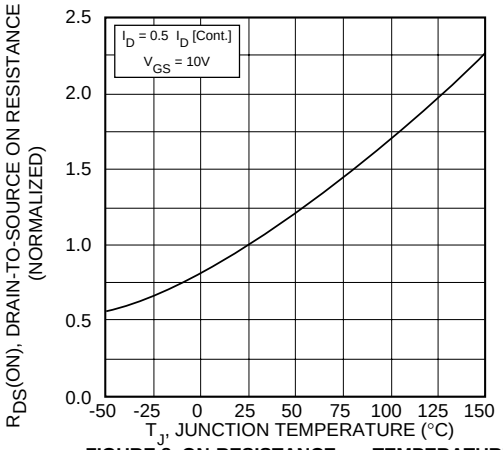


FIGURE 8, ON-RESISTANCE vs. TEMPERATURE

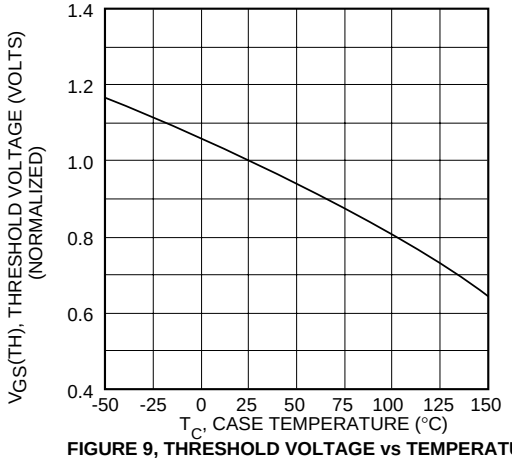


FIGURE 9, THRESHOLD VOLTAGE vs TEMPERATURE

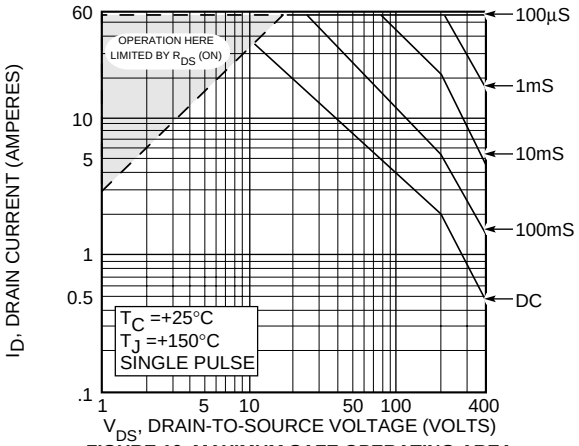


FIGURE 10, MAXIMUM SAFE OPERATING AREA

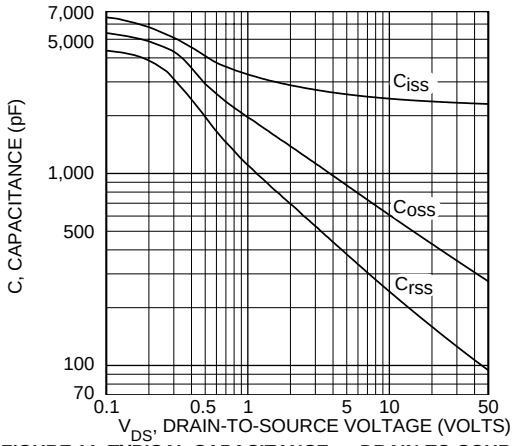


FIGURE 11, TYPICAL CAPACITANCE vs DRAIN-TO-SOURCE VOLTAGE

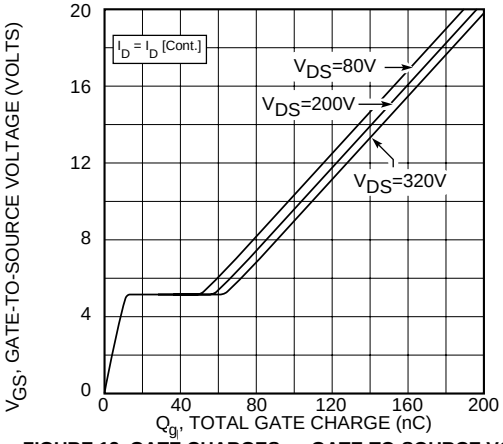


FIGURE 12, GATE CHARGES vs GATE-TO-SOURCE VOLTAGE

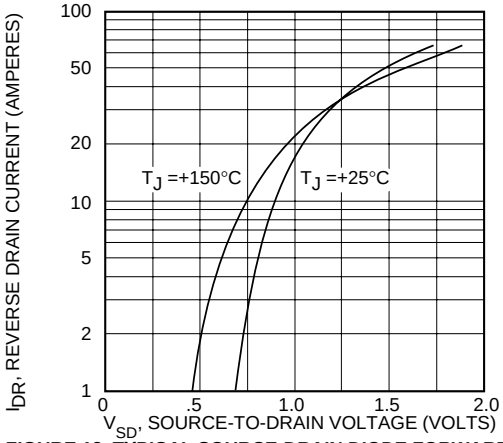
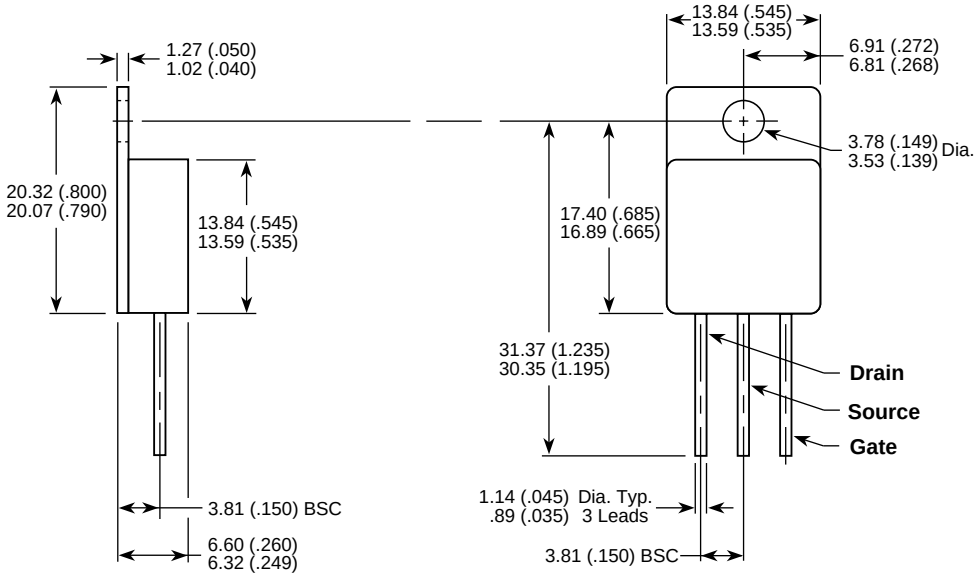


FIGURE 13, TYPICAL SOURCE-DRAIN DIODE FORWARD VOLTAGE

TO-254AA Package Outline



Dimensions in Millimeters and (Inches)