

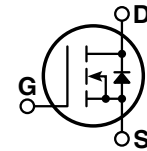


Power MOS V[®] is a new generation of high voltage N-Channel enhancement mode power MOSFETs. This new technology minimizes the JFET effect, increases packing density and reduces the on-resistance. Power MOS V[®] also achieves faster switching speeds through optimized gate layout.



- **Faster Switching**
- **100% Avalanche Tested**
- **Lower Leakage**
- **Popular SOT-227 Package**

Unless stated otherwise, Microsemi discrete MOSFETs contain a single MOSFET die. This device is made with two parallel MOSFET die. It is intended for switch-mode operation. It is not suitable for linear mode operation.



MAXIMUM RATINGS

All Ratings: $T_C = 25^\circ\text{C}$ unless otherwise specified.

Symbol	Parameter	APT10043JVR	UNIT
V_{DSS}	Drain-Source Voltage	1000	Volts
I_D	Continuous Drain Current @ $T_C = 25^\circ\text{C}$	22	Amps
I_{DM}	Pulsed Drain Current ^①	88	
V_{GS}	Gate-Source Voltage Continuous	± 30	Volts
V_{GSM}	Gate-Source Voltage Transient	± 40	
P_D	Total Power Dissipation @ $T_C = 25^\circ\text{C}$	500	Watts
	Linear Derating Factor	4	W/ $^\circ\text{C}$
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to 150	$^\circ\text{C}$
T_L	Lead Temperature: 0.063" from Case for 10 Sec.	300	
I_{AR}	Avalanche Current ^① (Repetitive and Non-Repetitive)	13	Amps
E_{AR}	Repetitive Avalanche Energy ^①	30	mJ
E_{AS}	Single Pulse Avalanche Energy ^④	1300	

STATIC ELECTRICAL CHARACTERISTICS

Symbol	Characteristic / Test Conditions	MIN	TYP	MAX	UNIT
BV_{DSS}	Drain-Source Breakdown Voltage ($V_{GS} = 0V, I_D = 250\mu\text{A}$)	1000			Volts
$I_{D(on)}$	On State Drain Current ^② ($V_{DS} > I_{D(on)} \times R_{DS(on)}$ Max, $V_{GS} = 10V$)	22			Amps
$R_{DS(on)}$	Drain-Source On-State Resistance ^② ($V_{GS} = 10V, 0.5 I_{D[Cont.]}$)			0.43	Ohms
I_{DSS}	Zero Gate Voltage Drain Current ($V_{DS} = V_{DSS}, V_{GS} = 0V$)			50	μA
	Zero Gate Voltage Drain Current ($V_{DS} = 0.8 V_{DSS}, V_{GS} = 0V, T_C = 125^\circ\text{C}$)			500	
I_{GSS}	Gate-Source Leakage Current ($V_{GS} = \pm 30V, V_{DS} = 0V$)			± 100	nA
$V_{GS(th)}$	Gate Threshold Voltage ($V_{DS} = V_{GS}, I_D = 1\text{mA}$)	2		4	Volts

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

DYNAMIC CHARACTERISTICS

APT10043JVR

Symbol	Characteristic	Test Conditions	MIN	TYP	MAX	UNIT
C_{iss}	Input Capacitance	$V_{GS} = 0V$ $V_{DS} = 25V$ $f = 1 \text{ MHz}$		7500	9000	pF
C_{oss}	Output Capacitance			675	945	
C_{rss}	Reverse Transfer Capacitance			310	465	
Q_g	Total Gate Charge ③	$V_{GS} = 10V$ $V_{DD} = 0.5 V_{DSS}$ $I_D = I_{D[Cont.]} @ 25^\circ C$		320	480	nC
Q_{gs}	Gate-Source Charge			38	57	
Q_{gd}	Gate-Drain ("Miller") Charge			169	250	
$t_{d(on)}$	Turn-on Delay Time	$V_{GS} = 15V$ $V_{DD} = 0.5 V_{DSS}$ $I_D = I_{D[Cont.]} @ 25^\circ C$ $R_G = 0.6\Omega$		14	28	ns
t_r	Rise Time			10	20	
$t_{d(off)}$	Turn-off Delay Time			51	75	
t_f	Fall Time			11	22	

SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

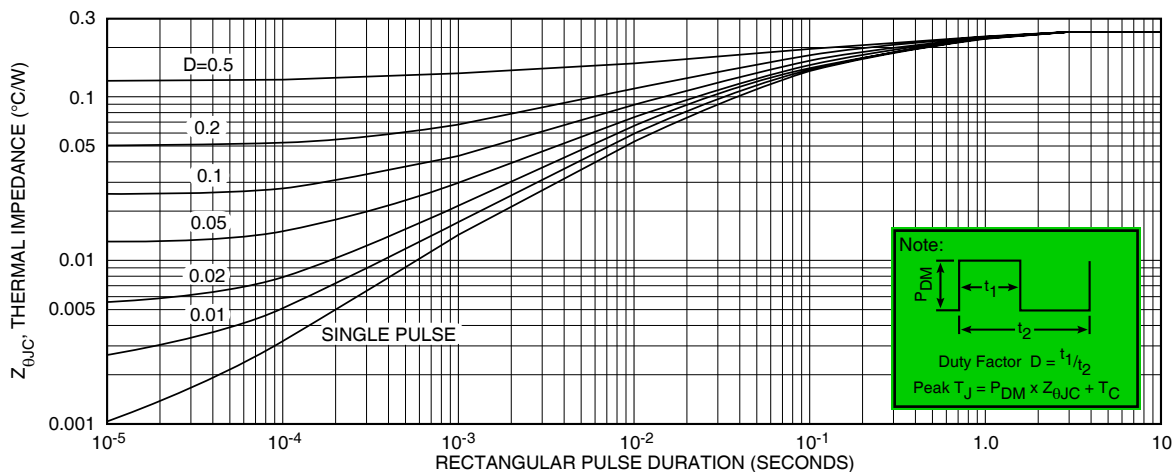
Symbol	Characteristic / Test Conditions	MIN	TYP	MAX	UNIT
I_S	Continuous Source Current (Body Diode)			22	Amps
I_{SM}	Pulsed Source Current ① (Body Diode)			88	
V_{SD}	Diode Forward Voltage ② ($V_{GS} = 0V, I_S = -I_{D[Cont.]}$)			1.3	Volts
t_{rr}	Reverse Recovery Time ($I_S = -I_{D[Cont.]}, di_S/dt = 100A/\mu s$)		1100		ns
Q_{rr}	Reverse Recovery Charge ($I_S = -I_{D[Cont.]}, di_S/dt = 100A/\mu s$)		17		μC

THERMAL/PACKAGE CHARACTERISTICS

Symbol	Characteristic	MIN	TYP	MAX	UNIT
$R_{\theta JC}$	Junction to Case			0.25	$^\circ C/W$
$R_{\theta JA}$	Junction to Ambient			40	
$V_{Isolation}$	RMS Voltage (50-60 Hz Sinusoidal Waveform From Terminals to Mounting Base for 1 Min.)	2500			Volts
Torque	Maximum Torque for Device Mounting Screws and Electrical Terminations.			13	lb•in

- ① Repetitive Rating: Pulse width limited by maximum junction temperature.
- ② Pulse Test: Pulse width < 380 μs , Duty Cycle < 2%
- ③ See MIL-STD-750 Method 3471
- ④ Starting $T_j = +25^\circ C$, $L = 5.37mH$, $R_G = 25\Omega$, Peak $I_L = 22A$

Microsemi reserves the right to change, without notice, the specifications and information contained herein.



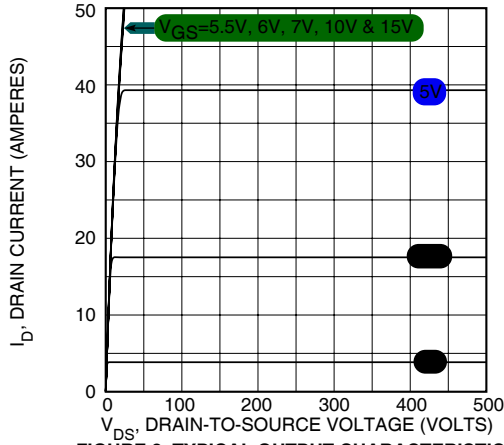


FIGURE 2, TYPICAL OUTPUT CHARACTERISTICS

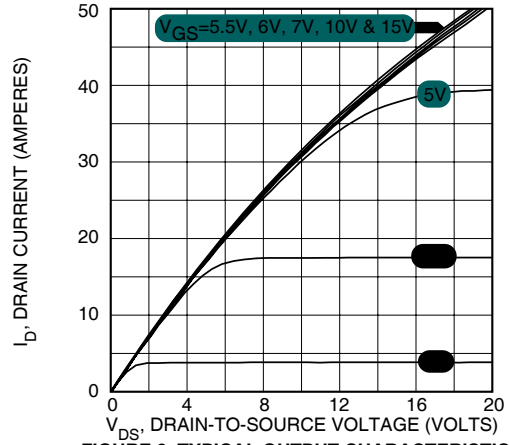


FIGURE 3, TYPICAL OUTPUT CHARACTERISTICS

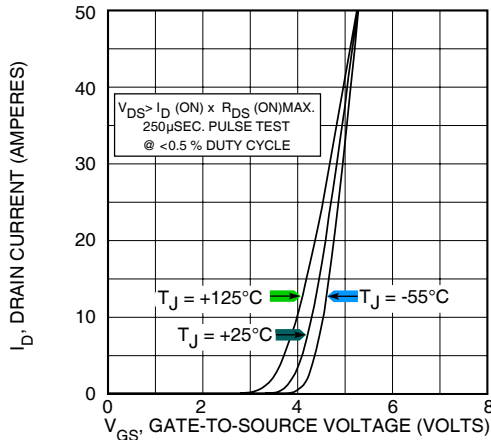


FIGURE 4, TYPICAL TRANSFER CHARACTERISTICS

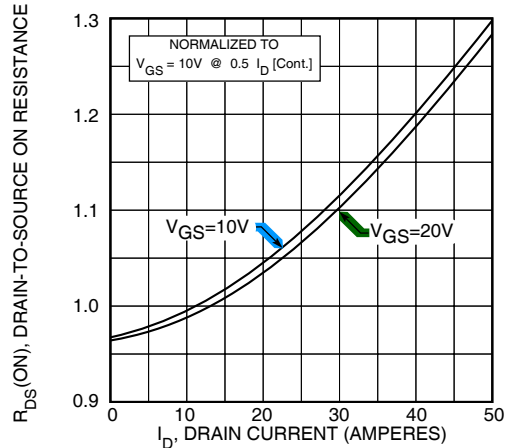


FIGURE 5, $R_{DS(ON)}$ vs DRAIN CURRENT

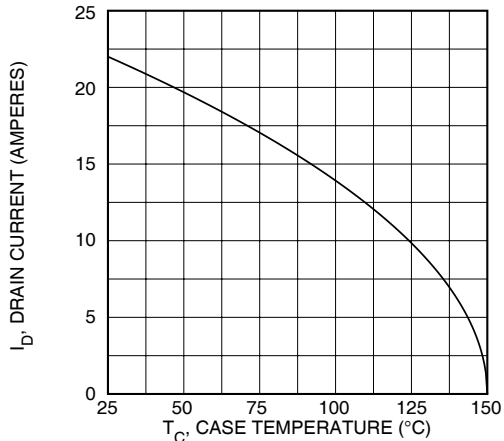


FIGURE 6, MAXIMUM DRAIN CURRENT vs CASE TEMPERATURE

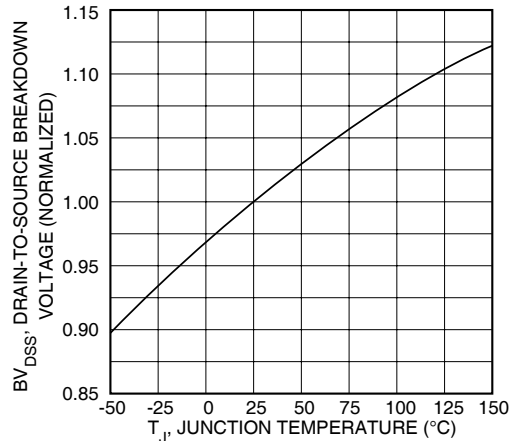


FIGURE 7, BREAKDOWN VOLTAGE vs TEMPERATURE

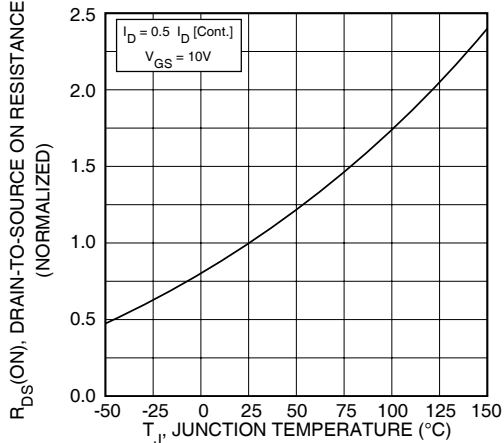


FIGURE 8, ON-RESISTANCE vs. TEMPERATURE

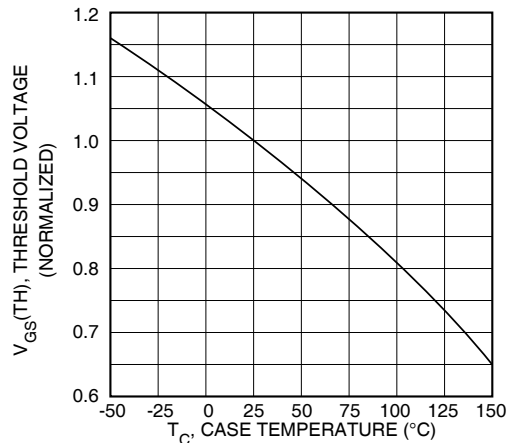


FIGURE 9, THRESHOLD VOLTAGE vs TEMPERATURE

I_D DRAIN CURRENT (AMPERES)

Graph removed

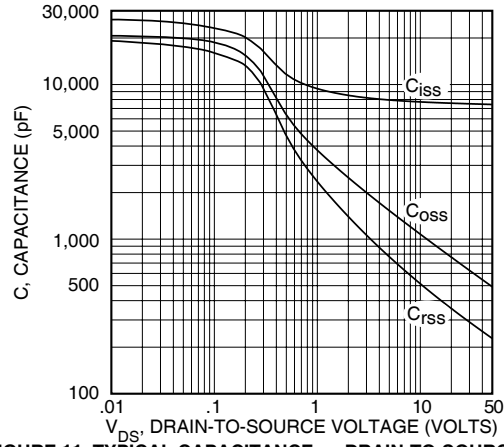


FIGURE 11, TYPICAL CAPACITANCE vs DRAIN-TO-SOURCE VOLTAGE

V_{DS} DRAIN-TO-SOURCE VOLTAGE (VOLTS)
FIGURE 10, MAXIMUM SAFE OPERATING AREA

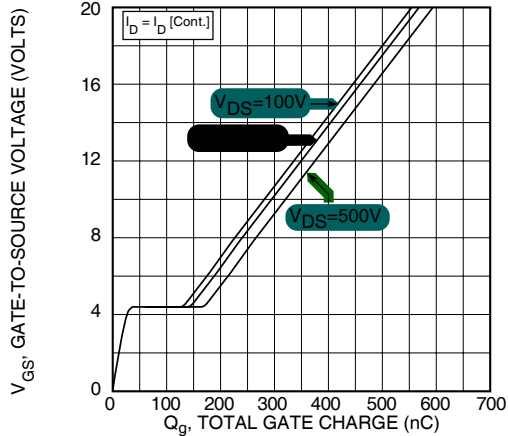


FIGURE 12, GATE CHARGES vs GATE-TO-SOURCE VOLTAGE

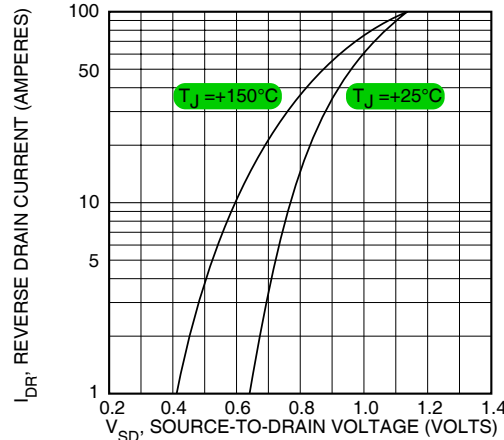
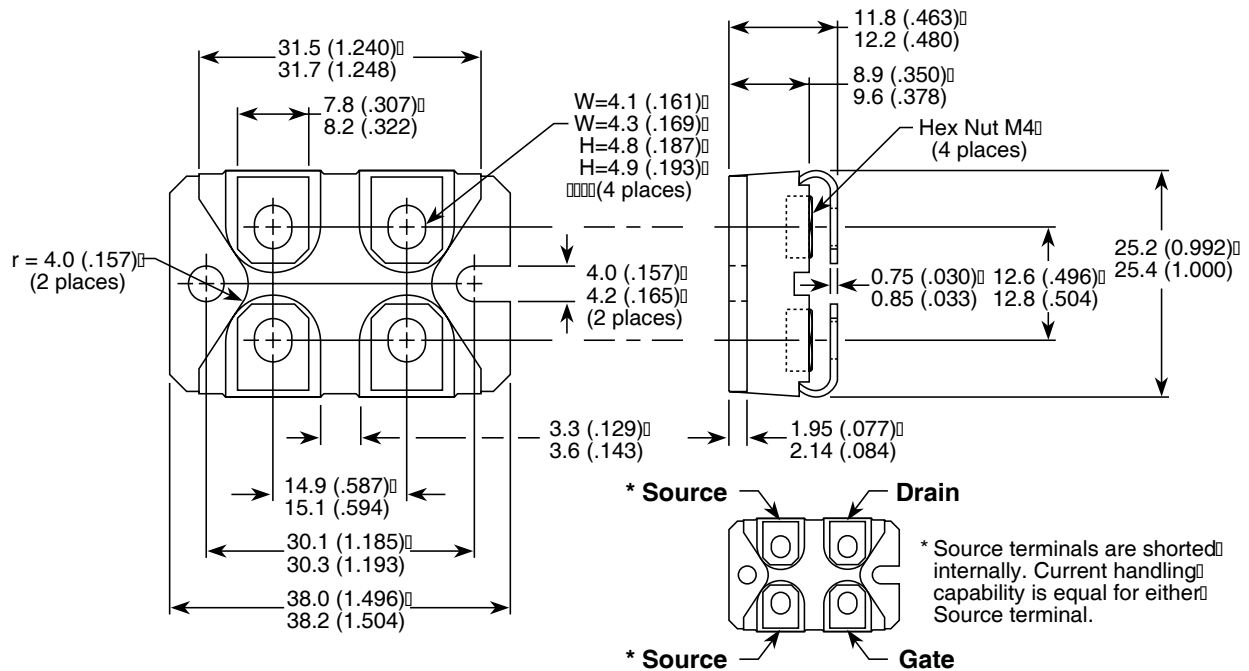


FIGURE 13, TYPICAL SOURCE-DRAIN DIODE FORWARD VOLTAGE

SOT-227 (ISOTOP®) Package Outline



Dimensions in Millimeters and (Inches)

UL Recognized File No. E145592