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TECHNICAL DATA SHEET

N-CHANNEL MOSFET

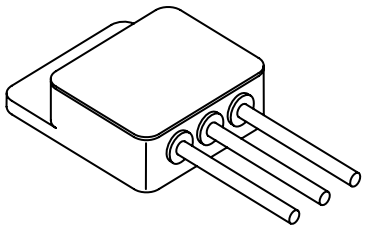
DEVICES

APT6017WVR
POWER MOS V®
600V 31.5A 0.170Ω

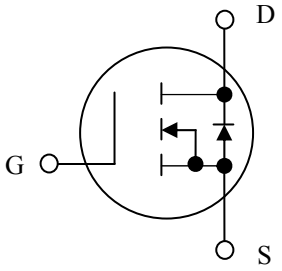
LEVELS
TX, TXV, S
CUSTOM SCREENS
AVAILABLE

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

Parameters / Test Conditions	Symbol	Value	Unit
Drain – Source Voltage	V_{DS}	600	Vdc
Gate – Source Voltage	V_{GS}	± 30	Vdc
Continuous Drain Current T_C = +25°C	I_{D1}	31.5	Adc
Max. Power Dissipation T_C = +25°C	P_{tl}	450 (1)	W
Drain to Source On State Resistance	$R_{ds(on)}$	0.170 (2)	Ω
Operating & Storage Temperature	T_{op}, T_{stg}	-55 to +150	°C
Lead temperature: 0.063" from Case for 10 Se.	T_L	300	°C
Avalanche Current (3) (Repetitive/ Non-repetitive)	I_{AR}	31.5	Adc
	E_{AR}	50	mJ
	E_{AS}	2500	mJ



TO-267



Note: (1) Derated Linearly by 3.6 W/°C for T_C > +25°C
(2) V_{GS} = 10Vdc, I_D = 15.75A
(3) Repetitive Rating: Pulse width limited by maximum junction temperature.

ELECTRICAL CHARACTERISTICS *(T_A = +25°C, unless otherwise noted)*

Parameters / Test Conditions	Symbol	Min.	Max.	Unit
Drain-Source Breakdown Voltage V_{GS} = 0V, I_D = 1mAdc	$V_{(BR)DSS}$	600		Vdc
Gate-Source Voltage (Threshold) $V_{DS} \geq V_{GS}$, I_D = 0.25mA	$V_{GS(th)1}$	2.0	4.0	Vdc
Gate Current V_{GS} = ±30V, V_{DS} = 0V V_{GS} = ±20V, V_{DS} = 0V, T_j = +125°C	I_{GSS1} I_{GSS2}		±100 ±200	nAdc
Drain Current V_{GS} = 0V, V_{DS} = 600V V_{GS} = 0V, V_{DS} = 480V, T_j = +125°C	I_{DSS1} I_{DSS2}		25 0.25	µAdc mAdc
Static Drain-Source On-State Resistance V_{GS} = 10V, I_D = 15.75A pulsed	$r_{DS(on)}$		0.170	Ω
Diode Forward Voltage V_{GS} = 0V, I_D = 31.5A pulsed	V_{SD}		1.3	Vdc

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DYNAMIC CHARACTERISTICS

Parameters / Test Conditions		Symbol	Min.	Max.	Unit
Capacitance: Input capacitance Output Capacitance Reverse Transfer Capacitance	 V_{GS} = 0V V_{DS} = 25V f =1 MHz	 Ciss Coss Crss		 9000 1260 480	pF
Gate Charge: On-State Gate Charge Gate to Source Charge Gate to Drain Charge	 V_{GS} = 10V, I_D = 31.5A V_{DS} = 300V	 $Q_{g(on)}$ Q_{gs} Q_{gd}		 475 70 190	nC

SWITCHING CHARACTERISTICS

Parameters / Test Conditions		Symbol	Min.	Max.	Unit
Switching time tests: Turn-on delay time Rinse time Turn-off delay time Fall time	 I_D = 31.5A, V_{GS} = 15Vdc, Gate drive impedance = 0.6Ω, V_{DD} = 300Vdc	 $t_{d(on)}$ t_r $t_{d(off)}$ t_f		 30 26 70 10	ns
Diode Reverse Recovery Time	di/dt ≤ 100A/µs, V_{DD} ≤ 30V, I_F = 31.5A	t_{rr}		690	ns
Diode Reverse Recovery Charge	di/dt ≤ 100A/µs, VDD ≤ 30V, IF = 31.5A	Q_{rr}		15.9	uC

THERMAL CHARACTERISTICS

Parameters / Test Conditions	Symbol	Min.	Max.	Unit
Junction to Case	$R_{\theta JC}$		0.28	°C/W
Junction to Ambient	$R_{\theta JA}$		40	°C/W

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GRAPHS

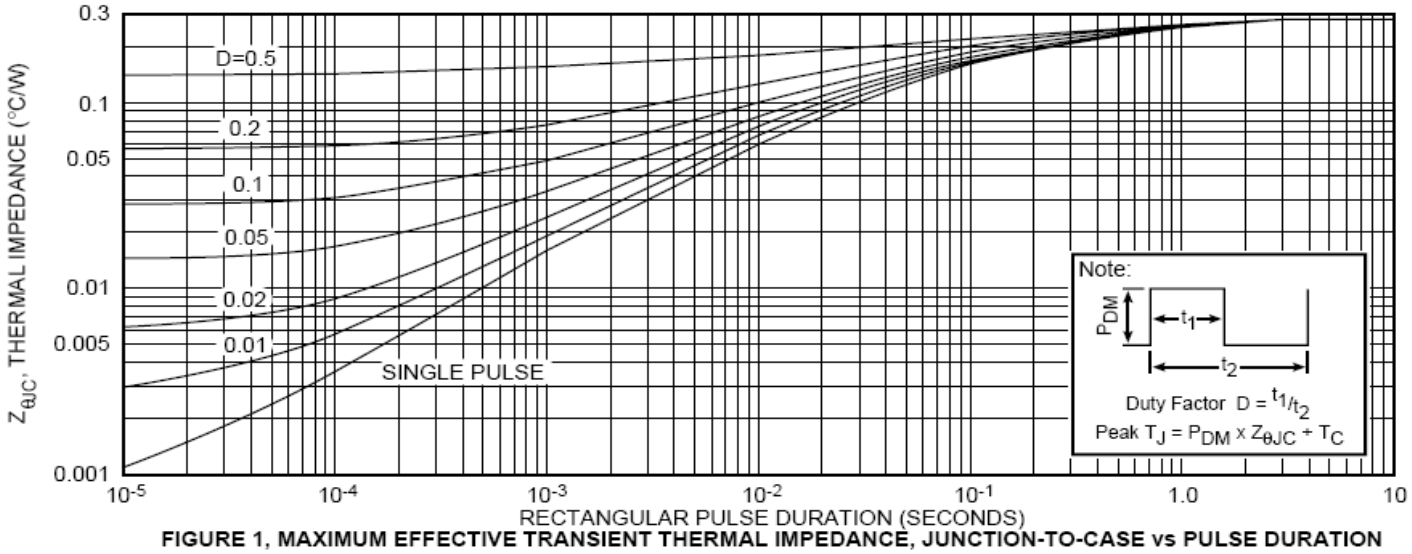

FIGURE 1, MAXIMUM EFFECTIVE TRANSIENT THERMAL IMPEDANCE, JUNCTION-TO-CASE vs PULSE DURATION

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APT6017WVR

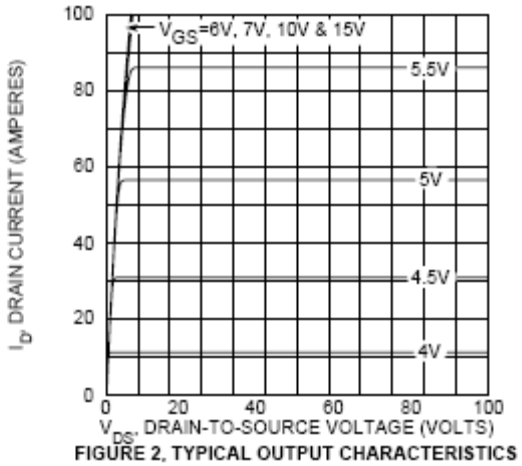


FIGURE 2, TYPICAL OUTPUT CHARACTERISTICS

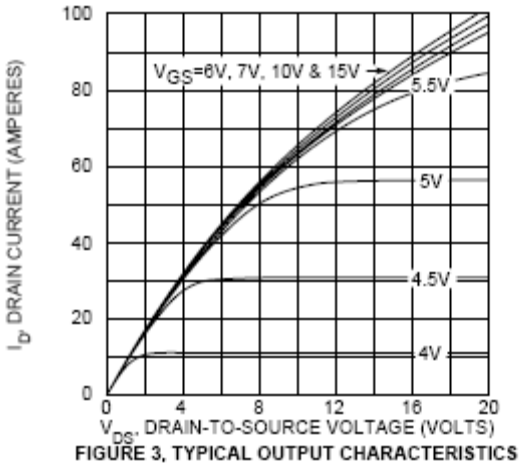


FIGURE 3, TYPICAL OUTPUT CHARACTERISTICS

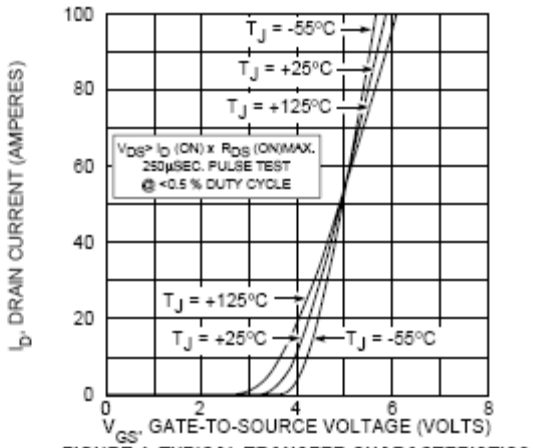


FIGURE 4, TYPICAL TRANSFER CHARACTERISTICS

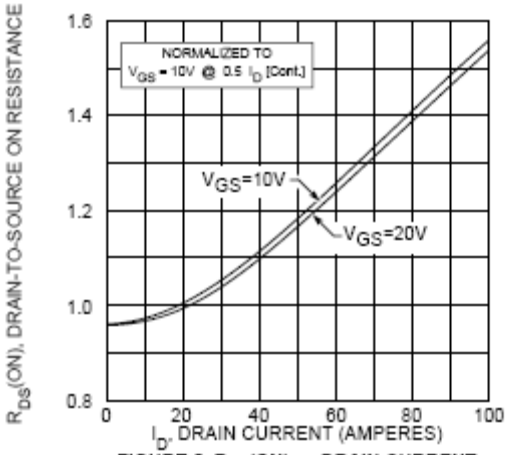
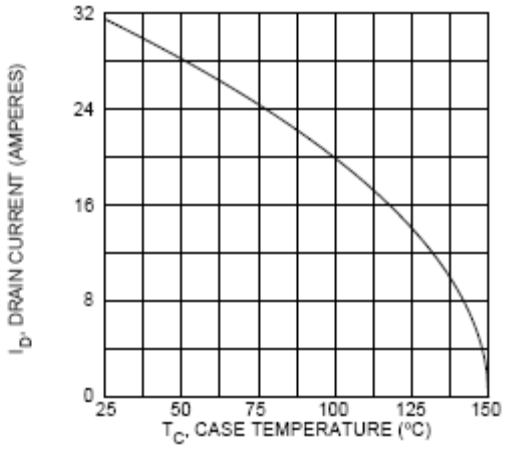


FIGURE 5, R_{DS}(ON) vs DRAIN CURRENT



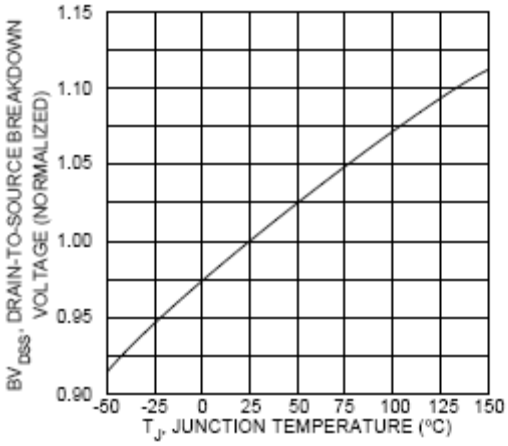


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FIGURE 6, MAXIMUM DRAIN CURRENT vs CASE TEMPERATURE

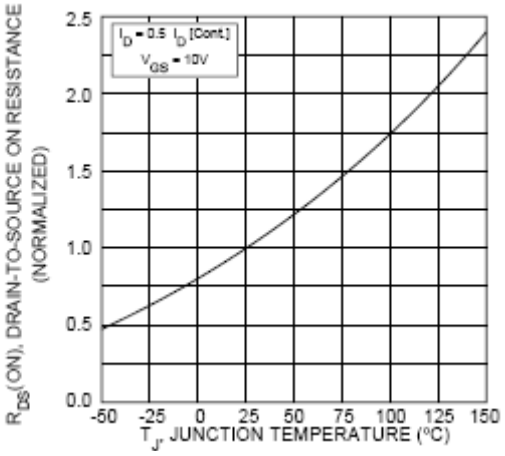

FIGURE 7, BREAKDOWN VOLTAGE vs TEMPERATURE

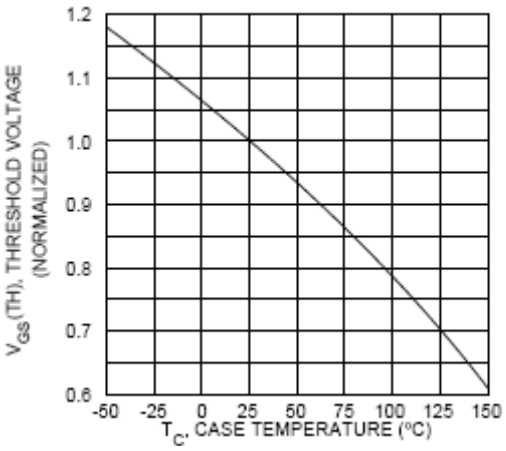

FIGURE 8, ON-RESISTANCE vs. TEMPERATURE

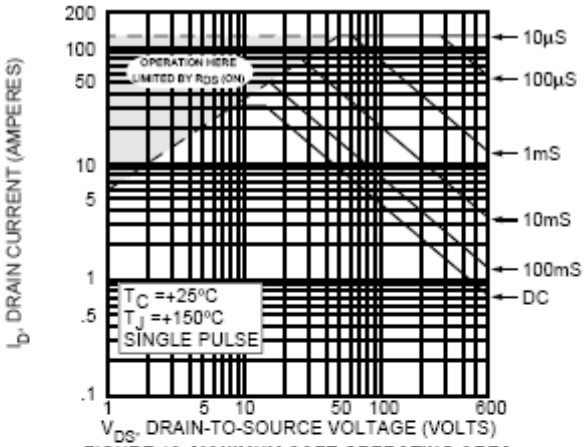

FIGURE 10, MAXIMUM SAFE OPERATING AREA

FIGURE 9, THRESHOLD VOLTAGE vs TEMPERATURE

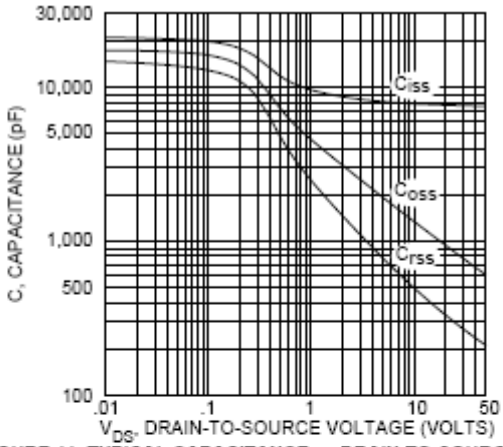

FIGURE 11, TYPICAL CAPACITANCE vs DRAIN-TO-SOURCE VOLTAGE

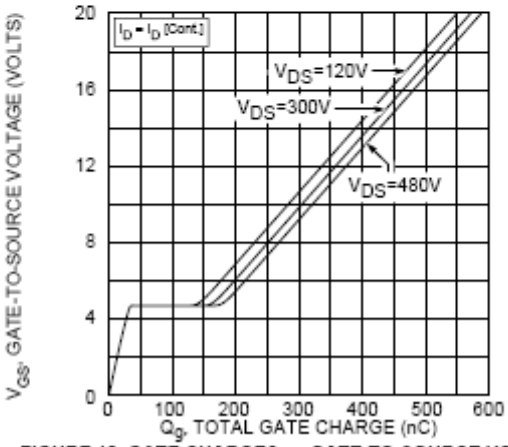

FIGURE 12, GATE CHARGES vs GATE-TO-SOURCE VOLTAGE

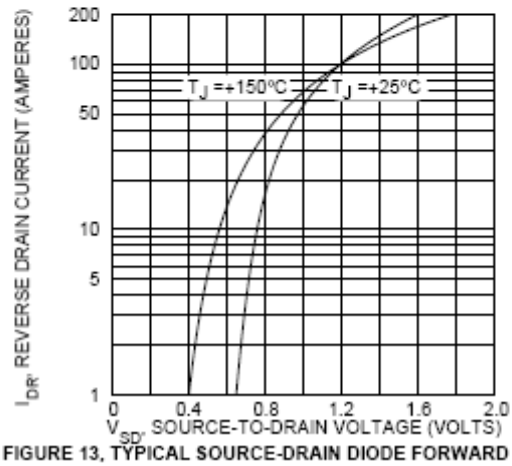

FIGURE 13, TYPICAL SOURCE-DRAIN DIODE FORWARD VOLTAGE

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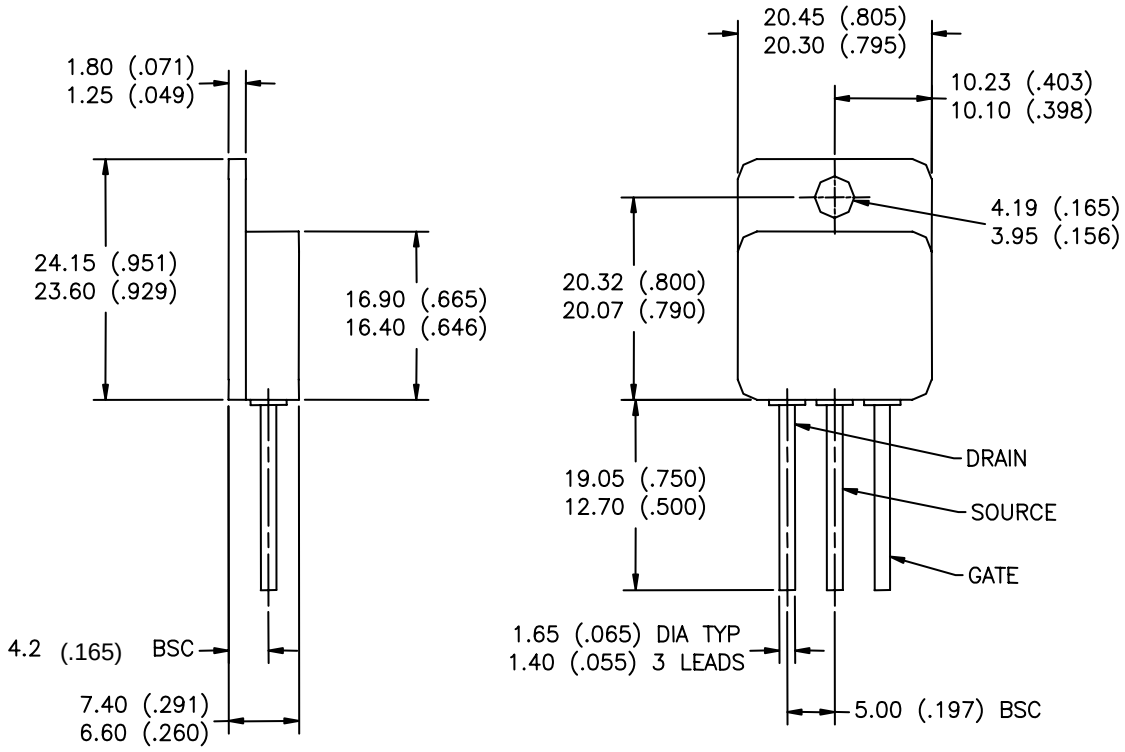
PACKAGE DIMENSIONS



DIMENSIONS IN MILLIMETERS AND (INCHES)