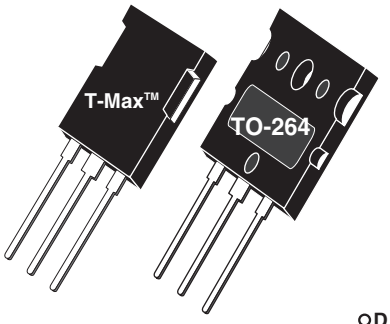
Microsemi
POWER PRODUCTS GROUP

APL502B2(G)
APL502L(G)

500V, 58A, 0.090Ω

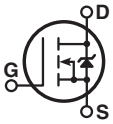
***G Denotes RoHS Compliant, Pb Free Terminal Finish.**

LINEAR MOSFET



Linear Mosfets are optimized for applications operating in the Linear region where concurrent high voltage and high current can occur at near DC conditions (>100 msec).

- **Higher FBSOA**
- **Popular T-MAX™ or TO-264 Package**
- **Higher Power Dissipation**



MAXIMUM RATINGS

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

Symbol	Parameter	APL502B2_L (G)	UNIT
V_{DSS}	Drain-Source Voltage	500	Volts
I_D	Continuous Drain Current @ T_C = 25°C	58	Amps
I_{DM}	Pulsed Drain Current ①	232	
V_{GS}	Gate-Source Voltage Continuous	±30	Volts
V_{GSM}	Gate-Source Voltage Transient	±40	
P_D	Total Power Dissipation @ T_C = 25°C	730	Watts
	Linear Derating Factor	5.84	W/°C
T_J,T_{STG}	Operating and Storage Junction Temperature Range	-55 to 150	°C
T_L	Lead Temperature: 0.063" from Case for 10 Sec.	300	
I_{AR}	Avalanche Current ① (Repetitive and Non-Repetitive)	58	Amps
E_{AR}	Repetitive Avalanche Energy ①	50	mJ
E_{AS}	Single Pulse Avalanche Energy ④	3000	

STATIC ELECTRICAL CHARACTERISTICS

Symbol	Characteristic / Test Conditions / Part Number	MIN	TYP	MAX	UNIT
BV_{DSS}	Drain-Source Breakdown Voltage (V_{GS} = 0V, I_D = 250 µA)	500			Volts
$I_D(ON)$	On State Drain Current ②(V_{DS} > $I_D(ON)$ x $R_{DS}(ON)$ Max, V_{GS} = 12V)	58			Amps
$R_{DS}(ON)$	Drain-Source On-State Resistance ②(V_{GS} = 12V, 29A)			0.09	Ohms
I_{DSS}	Zero Gate Voltage Drain Current (V_{DS} = 500V, V_{GS} = 0V)			25	µA
	Zero Gate Voltage Drain Current (V_{DS} = 400V, V_{GS} = 0V, T_C = 125°C)			250	
I_{GSS}	Gate-Source Leakage Current (V_{GS} = ±30V, V_{DS} = 0V)			±100	nA
$V_{GS}(TH)$	Gate Threshold Voltage (V_{DS} = V_{GS}, I_D = 2.5mA)	2		4	Volts

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

DYNAMIC CHARACTERISTICS

Symbol	Characteristic	Test Conditions	MIN	TYP	MAX	UNIT
C_{iss}	Input Capacitance	V_{GS} = 0V V_{DS} = 25V f = 1 MHz		7485	9000	pF
C_{oss}	Output Capacitance			1290	1810	
C_{rss}	Reverse Transfer Capacitance			617	930	
t_d(on)	Turn-on Delay Time	V_{GS} = 15V V_{DD} = 250V I_D = 29A @ 25°C R_G = 0.6w		13	26	ns
t_r	Rise Time			27	54	
t_d(off)	Turn-off Delay Time			56	84	
t_f	Fall Time			16	20	

THERMAL CHARACTERISTICS

Symbol	Characteristic	MIN	TYP	MAX	UNIT
R_{qJC}	Junction to Case			.17	°C/W
W_T	Package Weight		0.22		oz
			5.9		g

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°C, L = 1.78mH, R_G = 25W, Peak I_L = 58A

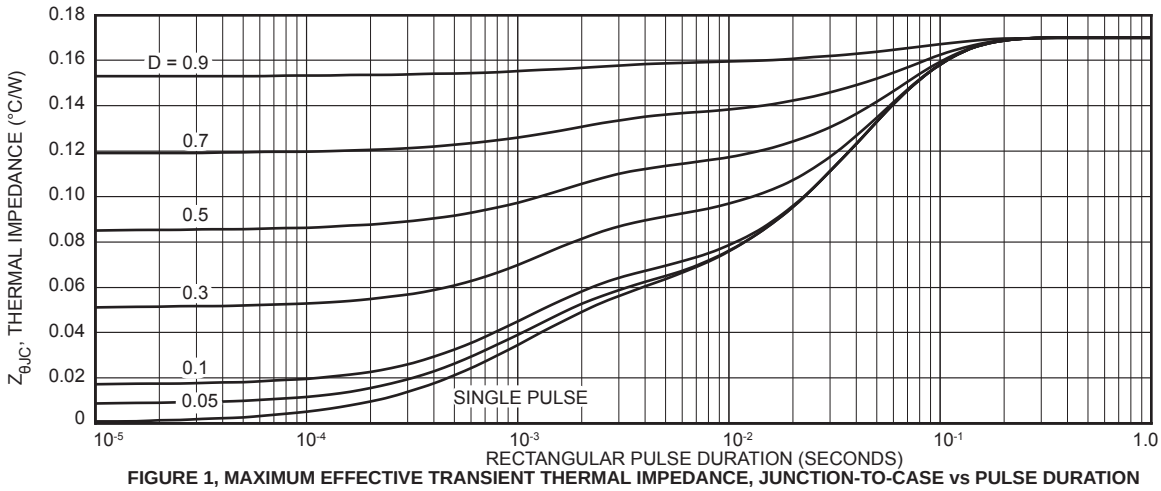


FIGURE 1, MAXIMUM EFFECTIVE TRANSIENT THERMAL IMPEDANCE, JUNCTION-TO-CASE vs PULSE DURATION

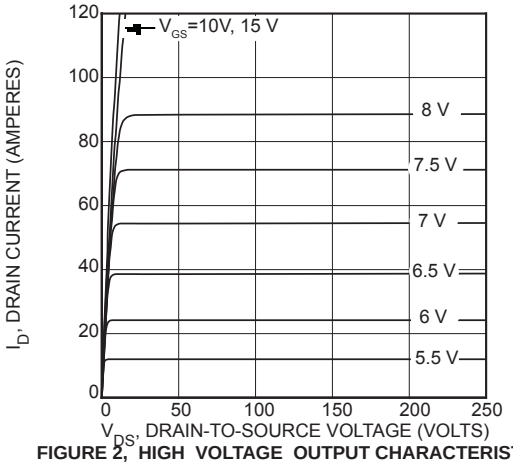


FIGURE 2, HIGH VOLTAGE OUTPUT CHARACTERISTICS

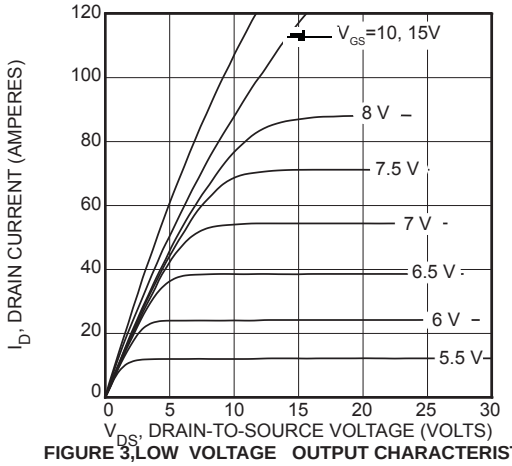


FIGURE 3,LOW VOLTAGE OUTPUT CHARACTERISTICS

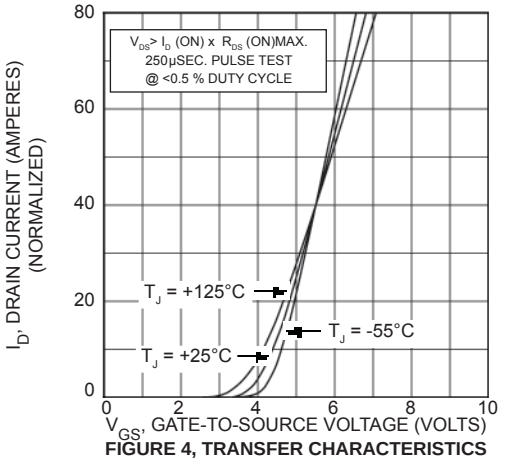


FIGURE 4, TRANSFER CHARACTERISTICS

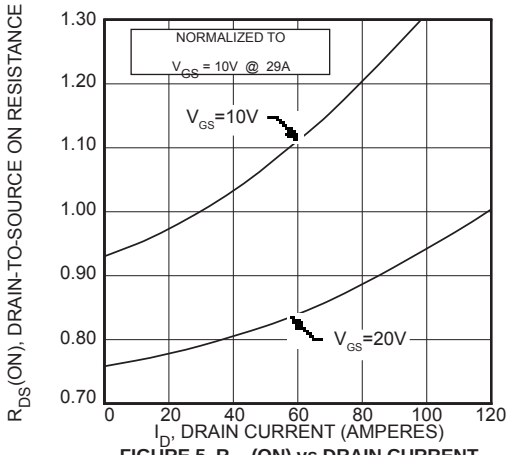


FIGURE 5, R_{DS}(ON) vs DRAIN CURRENT

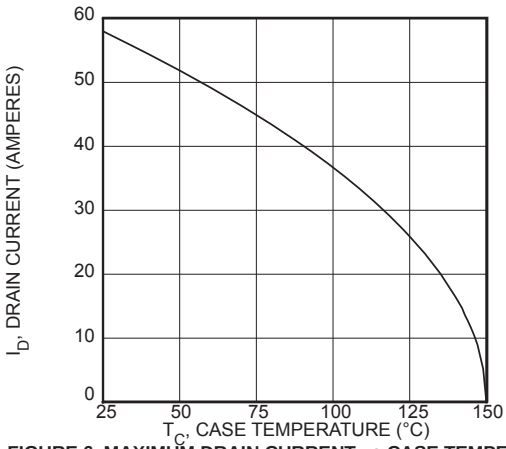


FIGURE 6, MAXIMUM DRAIN CURRENT vs CASE TEMPERATURE

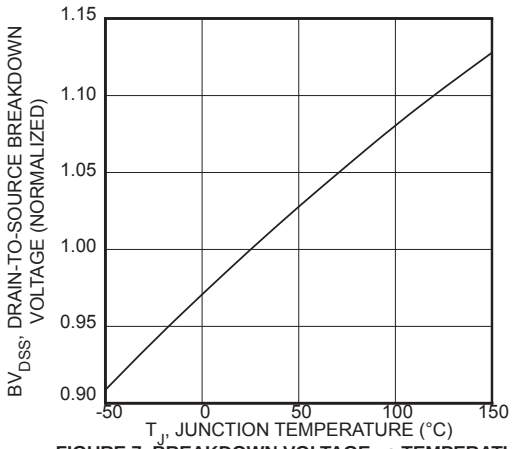


FIGURE 7, BREAKDOWN VOLTAGE vs TEMPERATURE

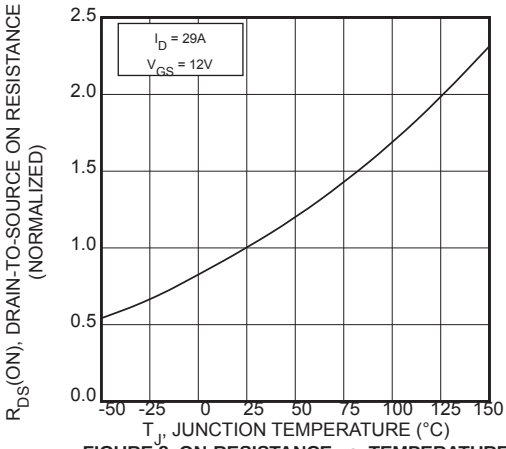


FIGURE 8, ON-RESISTANCE vs. TEMPERATURE

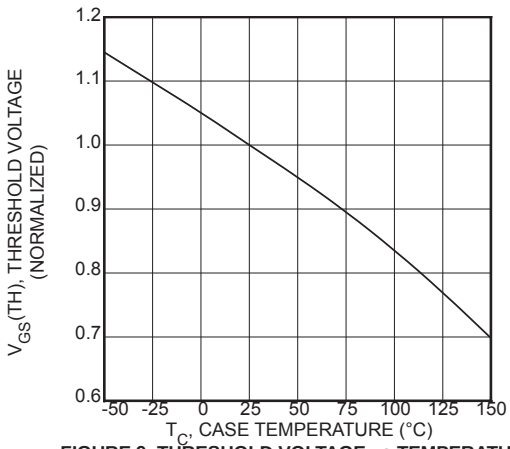


FIGURE 9, THRESHOLD VOLTAGE vs TEMPERATURE

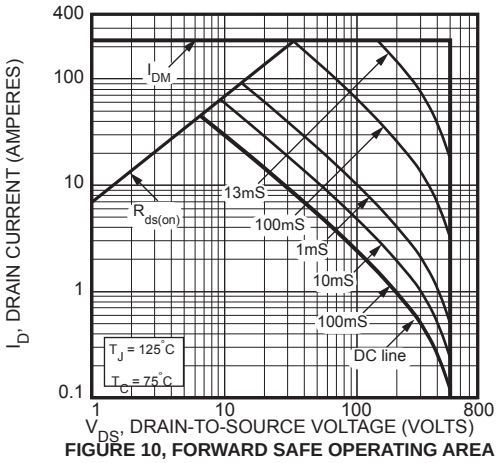


FIGURE 10, FORWARD SAFE OPERATING AREA

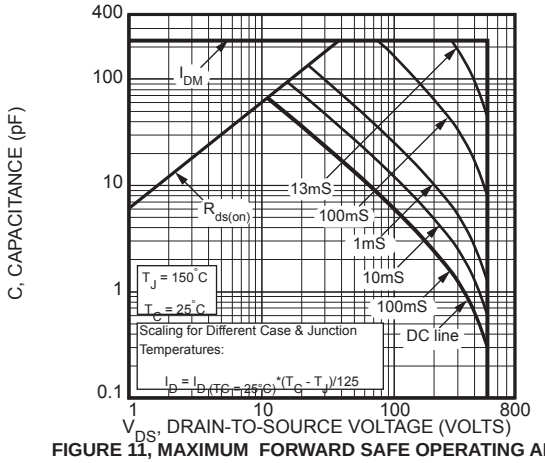


FIGURE 11, MAXIMUM FORWARD SAFE OPERATING AREA

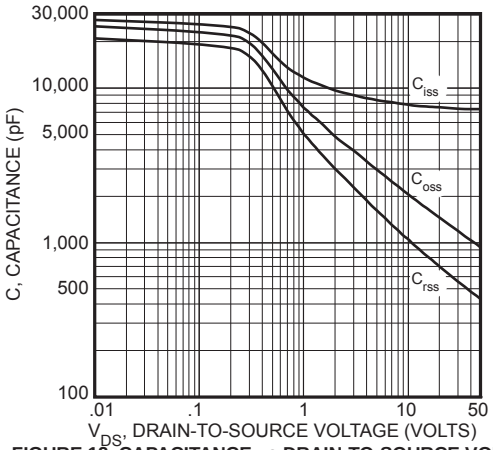
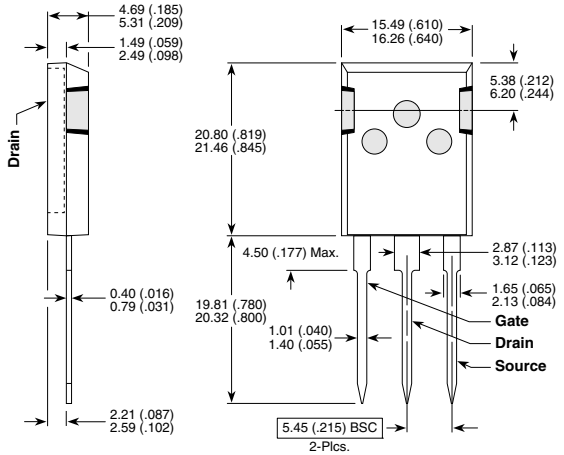


FIGURE 12, CAPACITANCE vs DRAIN-TO-SOURCE VOLTAGE

T-MAX™ (B2) Package Outline

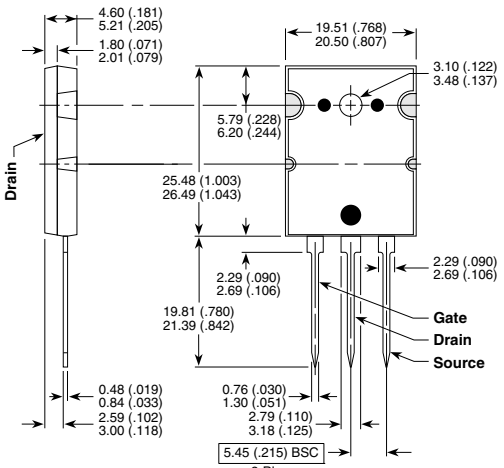
TO-264 (L) Package Outline

e1 SAC 96.5% Sn, 3.0% Ag, 0.5% Cu Plated



These dimensions are equal to the TO-247 without the mounting hole.

Dimensions in Millimeters and (Inches)



Dimensions in Millimeters and (Inches)