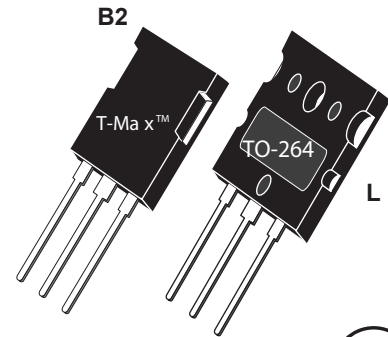


LINEAR MOSFET

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
- Higher Power Dissipation
- RoHS Compliant 
- Popular T-MAX™ or TO-264 Package



MAXIMUM RATINGS

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

Symbol	Parameter	APL502B2_L(G)	UNIT
V_{DSS}	Drain-Source Voltage	500	Volts
I_D	Continuous Drain Current @ $T_C = 25^\circ\text{C}$	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 @ $T_C = 25^\circ\text{C}$	730	Watts
	Linear Derating Factor	5.84	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)	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 ($V_{GS} = 0V, I_D = 250 \mu\text{A}$)	500			Volts
$I_D(\text{ON})$	On State Drain Current ^② ($V_{DS} > I_D(\text{ON}) \times R_{DS}(\text{ON})$ Max, $V_{GS} = 15V$)	58			Amps
$R_{DS}(\text{ON})$	Drain-Source On-State Resistance ^② ($V_{GS} = 15V, 29A$)			0.09	Ohms
I_{DSS}	Zero Gate Voltage Drain Current ($V_{DS} = 500V, V_{GS} = 0V$)			25	μA
	Zero Gate Voltage Drain Current ($V_{DS} = 400V, V_{GS} = 0V, T_C = 125^\circ\text{C}$)			250	
I_{GSS}	Gate-Source Leakage Current ($V_{GS} = \pm 30V, V_{DS} = 0V$)			± 100	nA
$V_{GS}(\text{TH})$	Gate Threshold Voltage ($V_{DS} = V_{GS}, I_D = 2.5\text{mA}$)	2		4	Volts



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

Symbol	Characteristic	Test Conditions	MIN	TYP	MAX	UNIT
C_{iss}	Input Capacitance	$V_{GS} = 0V$ $V_{DS} = 25V$ $f = 1\text{ MHz}$		7485	9000	pF
C_{oss}	Output Capacitance			1290	1810	
C_{rss}	Reverse Transfer Capacitance			617	930	
$t_{d(on)}$	Turn-on Delay Time	$V_{GS} = 15V$ $V_{DD} = 250V$ $I_D = 29A @ 25^\circ C$ $R_G = 0.6\Omega$		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
$R_{\theta JC}$	Junction to Case			.17	$^\circ C/W$
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 $T_j = +25^\circ C$, $L = 1.78mH$, $R_G = 25\Omega$, Peak $I_L = 58A$
- Microsemi reserves the right to change, without notice, the specifications and information contained herein.

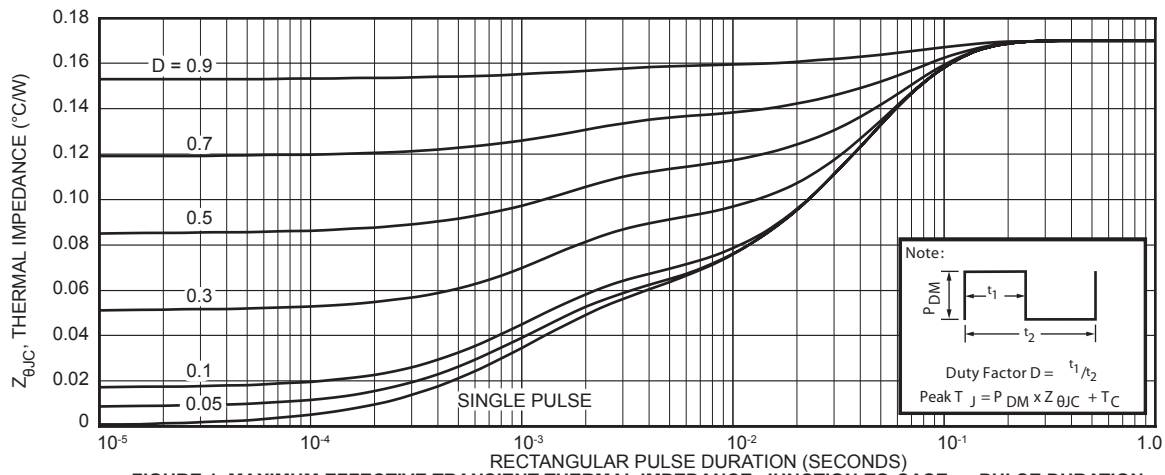
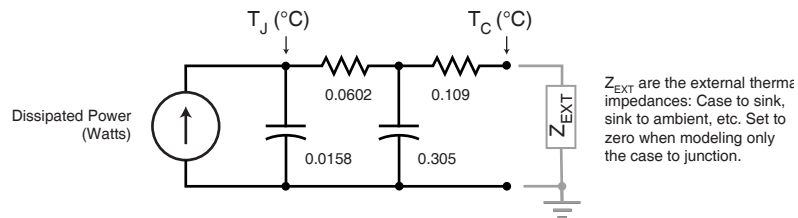


FIGURE 1, MAXIMUM EFFECTIVE TRANSIENT THERMAL IMPEDANCE, JUNCTION-TO-CASE vs PULSE DURATION



Z_{EXT} are the external thermal impedances: Case to sink, sink to ambient, etc. Set to zero when modeling only the case to junction.

FIGURE 1a, TRANSIENT THERMAL IMPEDANCE MODEL

Typical Performance Curves

APL502B2_L(G)

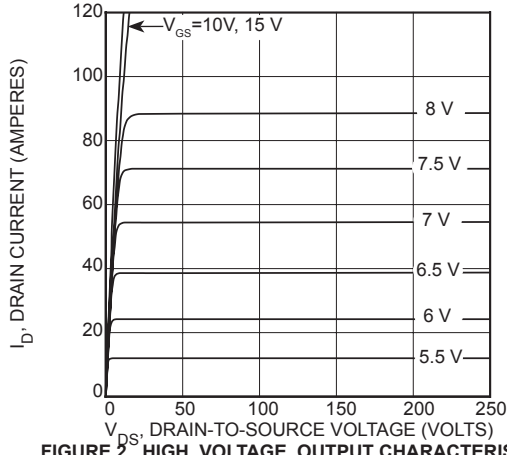


FIGURE 2, HIGH VOLTAGE OUTPUT CHARACTERISTICS

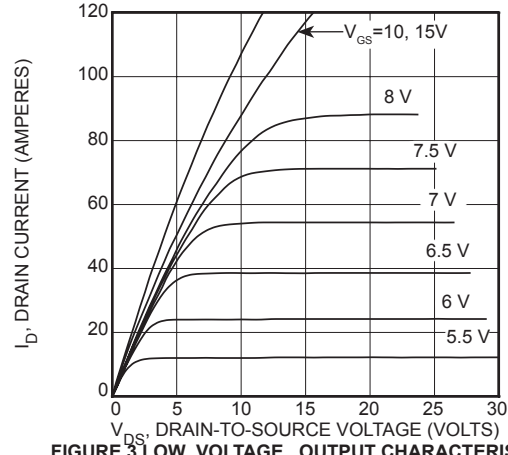


FIGURE 3, LOW VOLTAGE OUTPUT CHARACTERISTICS

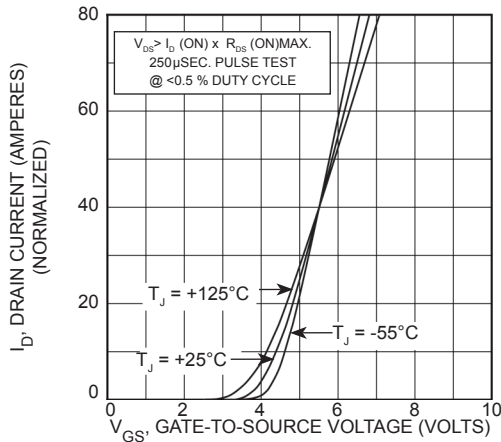


FIGURE 4, TRANSFER CHARACTERISTICS

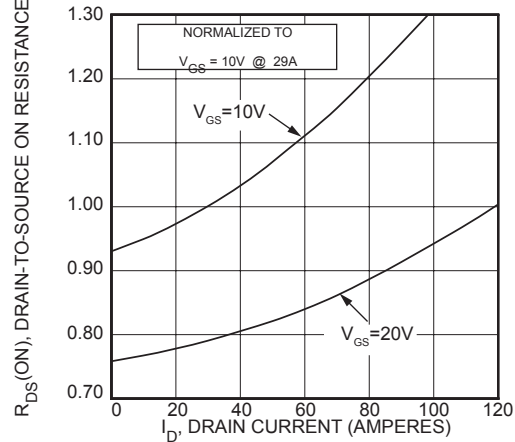


FIGURE 5, $R_{DS(ON)}$ vs DRAIN CURRENT

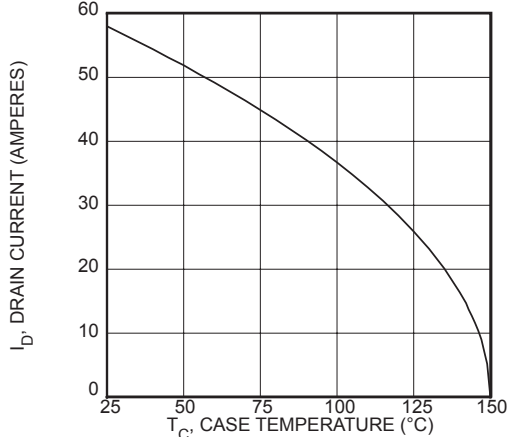


FIGURE 6, MAXIMUM DRAIN CURRENT vs CASE TEMPERATURE

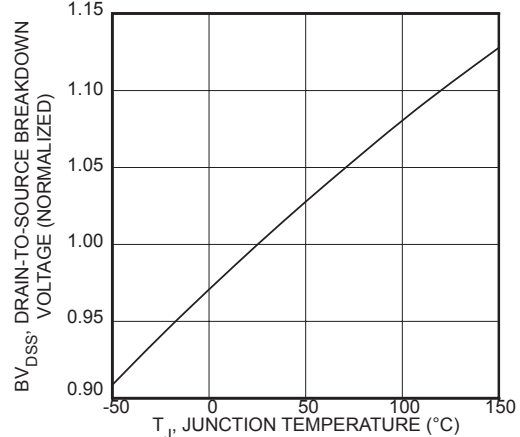


FIGURE 7, BREAKDOWN VOLTAGE vs TEMPERATURE

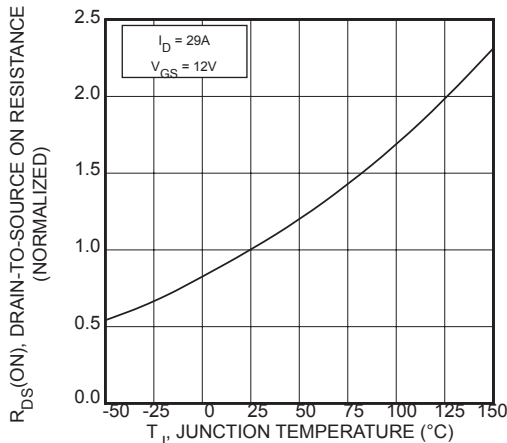


FIGURE 8, ON-RESISTANCE vs. TEMPERATURE

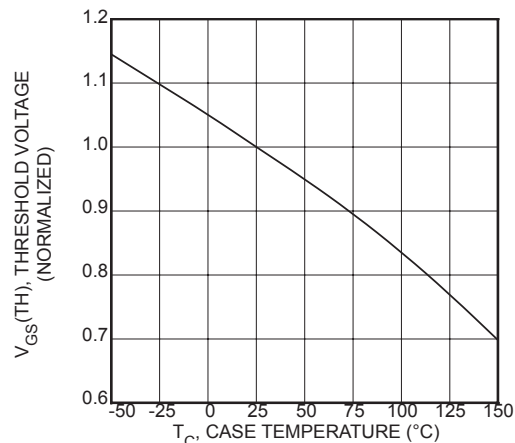


FIGURE 9, THRESHOLD VOLTAGE vs TEMPERATURE

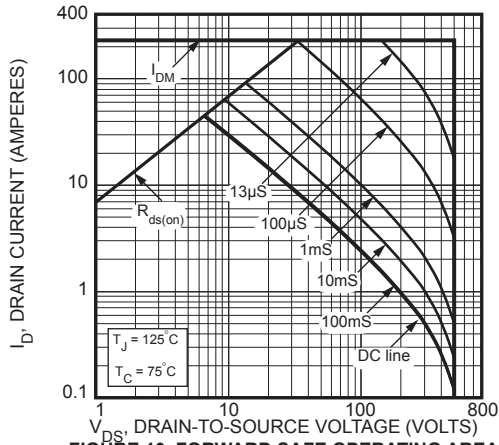


FIGURE 10, FORWARD SAFE OPERATING AREA

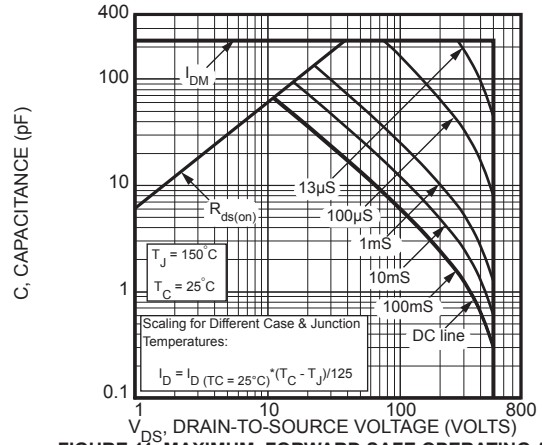


FIGURE 11, MAXIMUM FORWARD SAFE OPERATING AREA

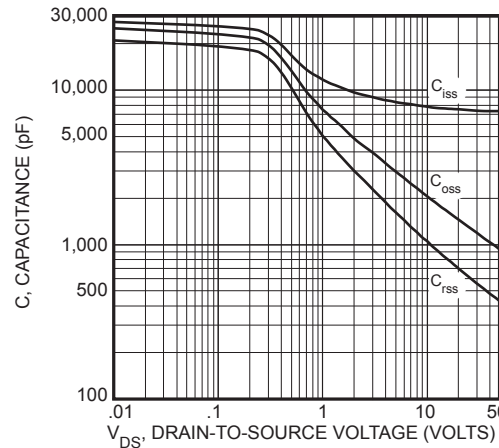
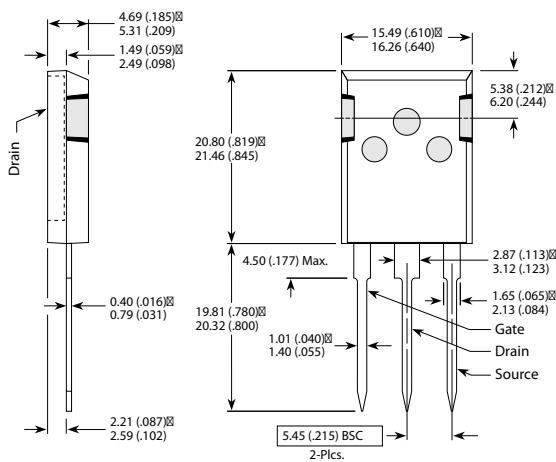


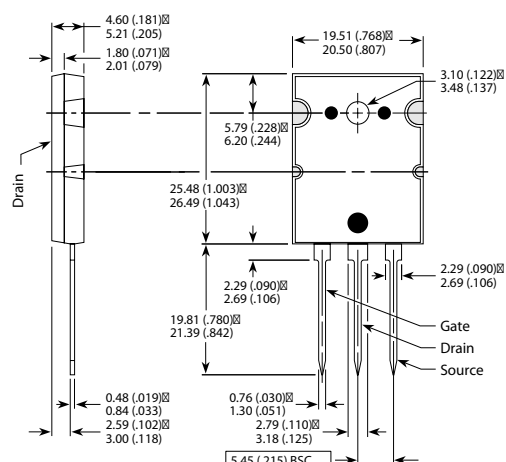
FIGURE 12, CAPACITANCE vs DRAIN-TO-SOURCE VOLTAGE

T-MAX™ (B2) Package Outline



These dimensions are equal to the TO-247 without the mounting hole.
Dimensions in Millimeters and (Inches)

TO-264 (L) Package Outline



Dimensions in Millimeters and (Inches)

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