Electrical Characteristics @ Tj = 25°C (Unless Otherwise Specified)

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
BV_{DSS}	Drain-to-Source Breakdown Voltage	100	——	——	V	V_{GS} = 0V, I_D = 1.0mA
$\Delta BV_{DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	——	0.13	——	V/°C	Reference to 25°C, I_D = 1.0mA
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	——	——	0.077	Ω	V_{GS} = 10V, I_{D2} = 20A ④
		——	——	0.125		V_{GS} = 10V, I_{D1} = 28A ④
$V_{GS(th)}$	Gate Threshold Voltage	2.0	——	4.0	V	V_{DS} = V_{GS}, I_D = 250µA
Gfs	Forward Transconductance	9.1	——	——	S	V_{DS} = 15V, I_{D2} = 20A ④
I_{DSS}	Zero Gate Voltage Drain Current	——	——	25	µA	V_{DS} = 80V, V_{GS} = 0V
		——	——	250		V_{DS} = 80V,V_{GS} = 0V,T_J =125°C
I_{GSS}	Gate-to-Source Leakage Forward	——	——	100	nA	V_{GS} = 20V
	Gate-to-Source Leakage Reverse	——	——	-100		V_{GS} = -20V
Q_G	Total Gate Charge	——	——	59	nC	I_{D1} = 28A
Q_{GS}	Gate-to-Source Charge	——	——	16		V_{DS} = 50V
Q_{GD}	Gate-to-Drain ('Miller') Charge	——	——	30.7		V_{GS} = 10V
$t_{d(on)}$	Turn-On Delay Time	——	——	21	ns	V_{DD} = 50V
tr	Rise Time	——	——	105		I_{D1} = 20A
$t_{d(off)}$	Turn-Off Delay Time	——	——	64		R_G = 9.1Ω
t_f	Fall Time	——	——	65		V_{GS} = 10V
Ls +L_D	Total Inductance	——	6.8	——	nH	Measured from Drain lead (6mm / 0.25 in from package) to Source lead (6mm/ 0.25 in from package)
C_{iss}	Input Capacitance	——	1600	——	pF	V_{GS} = 0V
C_{oss}	Output Capacitance	——	550	——		V_{DS} = 25V
C_{rss}	Reverse Transfer Capacitance	——	120	——		f = 1.0MHz

Source-Drain Diode Ratings and Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
I_S	Continuous Source Current (Body Diode)	——	——	28	A	
I_{SM}	Pulsed Source Current (Body Diode) ①	——	——	112		
V_{SD}	Diode Forward Voltage	——	——	1.5	V	T_J = 25°C,I_S = 28A, V_{GS} = 0V④
t_{rr}	Reverse Recovery Time	——	——	400	ns	T_J = 25°C ,I_F = 28A,V_{DD} ≤ 30V
Q_{rr}	Reverse Recovery Charge	——	——	2.9	µC	di/dt = 100A/µs ④
t_{on}	Forward Turn-On Time	Intrinsic turn-on time is negligible (turn-on is dominated by L_S+L_D)				

Thermal Resistance

Symbol	Parameter	Min.	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-Case	——	——	1.0	°C/W
$R_{\theta CS}$	Case -to-Sink	——	0.21	——	
$R_{\theta JA}$	Junction-to-Ambient (Typical socket mount)	——	——	48	

Footnotes:

① Repetitive Rating; Pulse width limited by maximum junction temperature.

② V_{DD} = 25V, starting T_J = 25°C, L = 0.64mH, Peak I_L = 28A, V_{GS} = 10V.

③ I_{SD} ≤ 28A, di/dt ≤ 170A/µs, V_{DD} ≤ 100V, T_J ≤ 150°C.

④ Pulse width ≤ 300 µs; Duty Cycle ≤ 2%

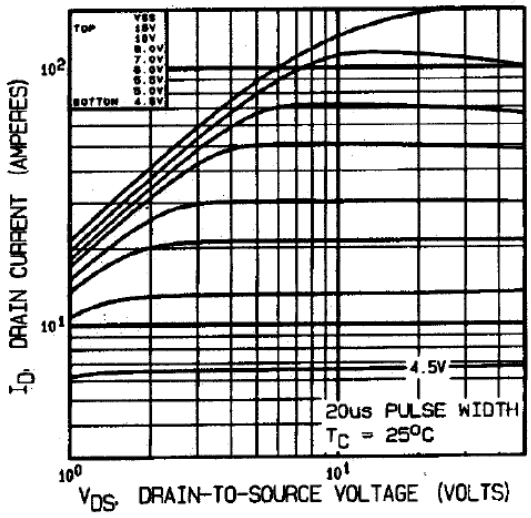


Fig 1. Typical Output Characteristics

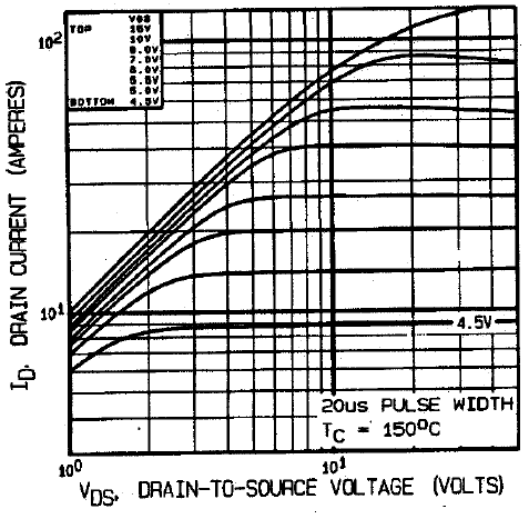


Fig 2. Typical Output Characteristics

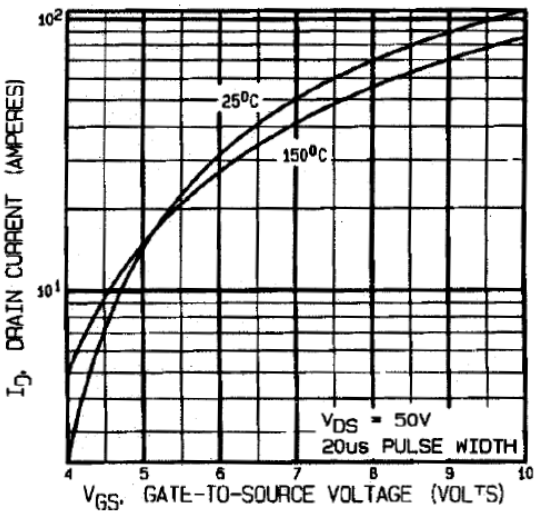


Fig 3. Typical Transfer Characteristics

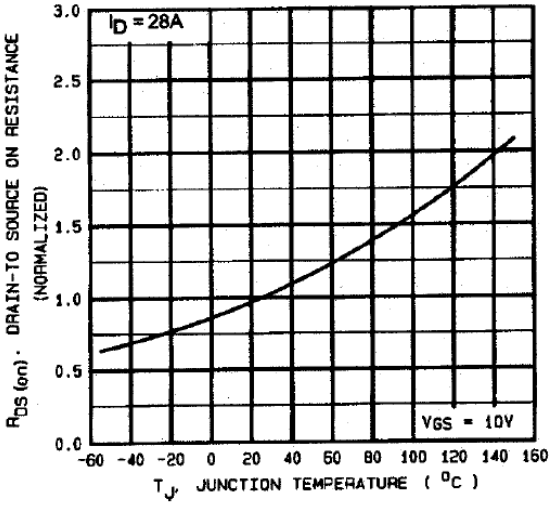


Fig 4. Normalized On-Resistance Vs. Temperature

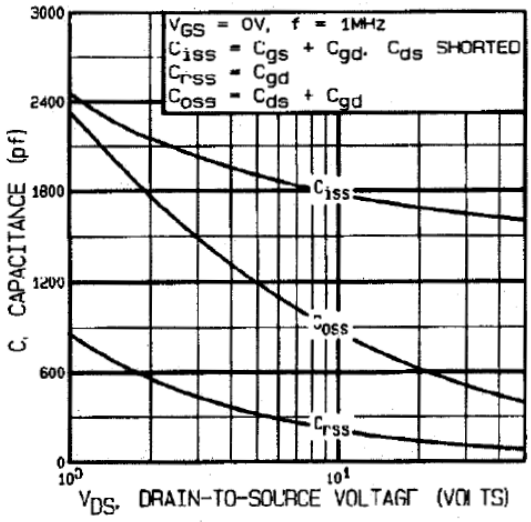


Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

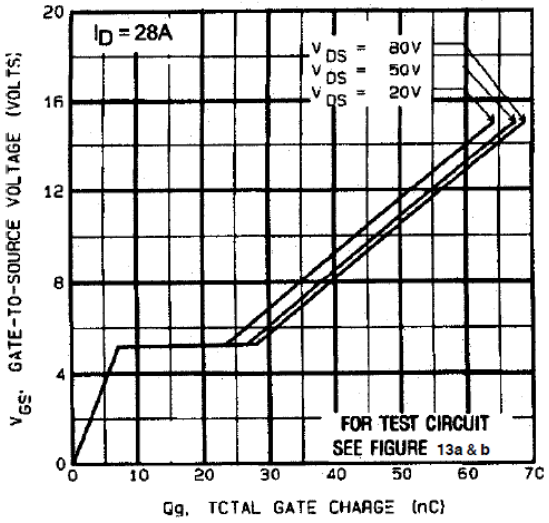


Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage

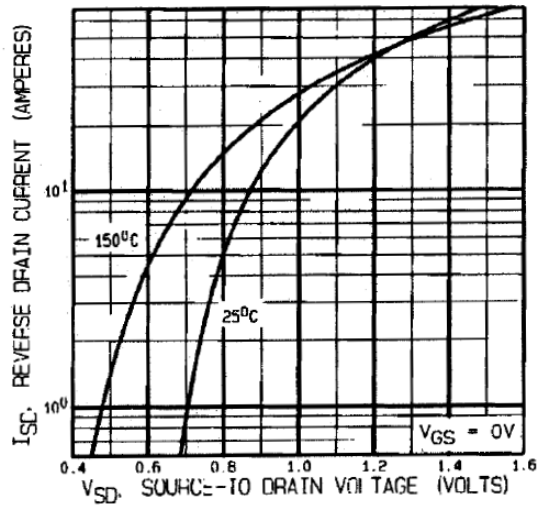


Fig 7. Typical Source-Drain Diode Forward Voltage

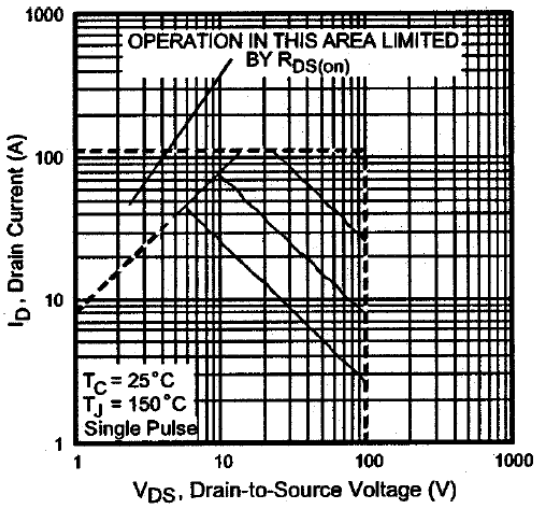


Fig 8. Maximum Safe Operating Area

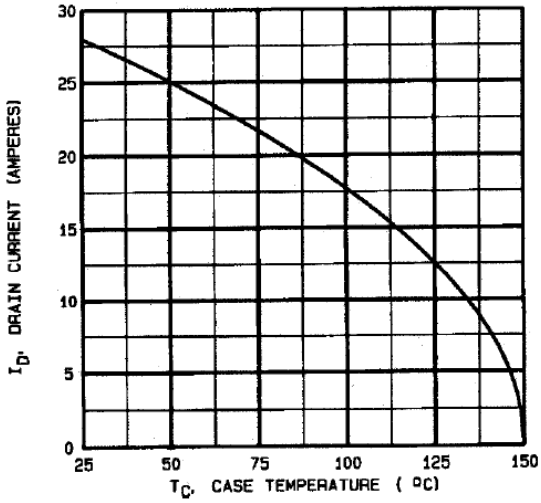


Fig 9. Maximum Drain Current Vs.Case Temperature

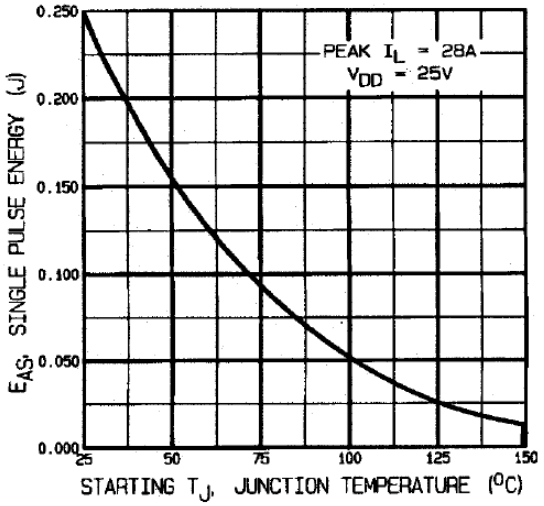


Fig 10. Maximum Avalanche Energy Vs. Drain Current

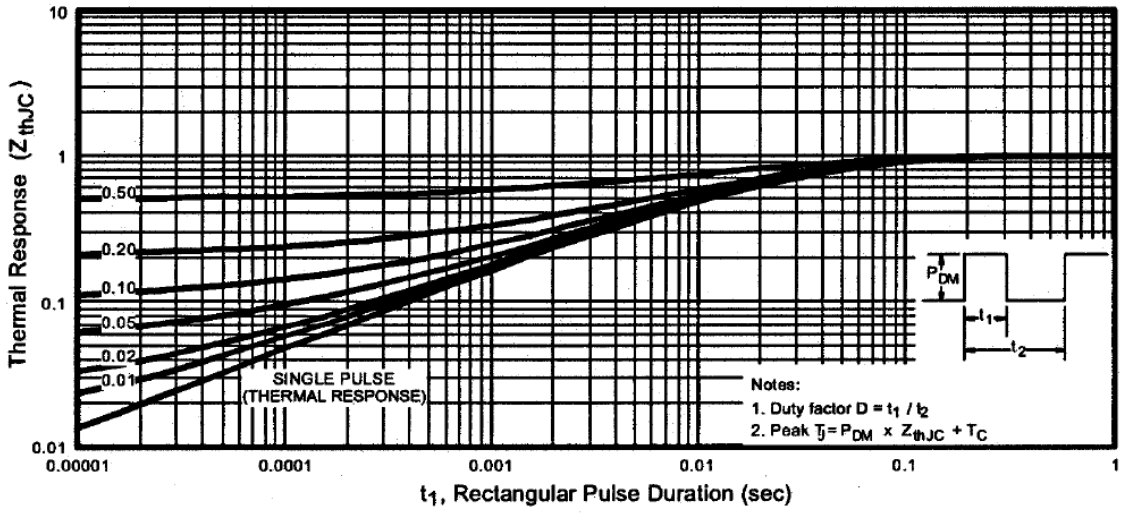


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Case

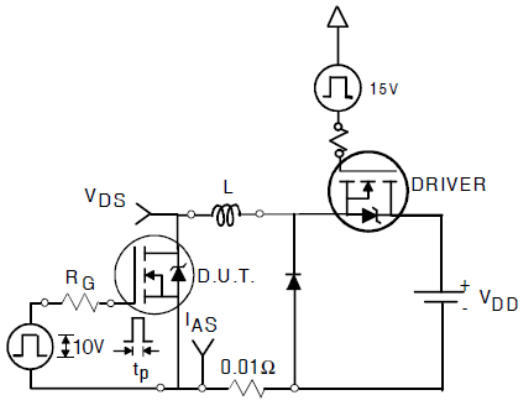


Fig 12a. Unclamped Inductive Test Circuit

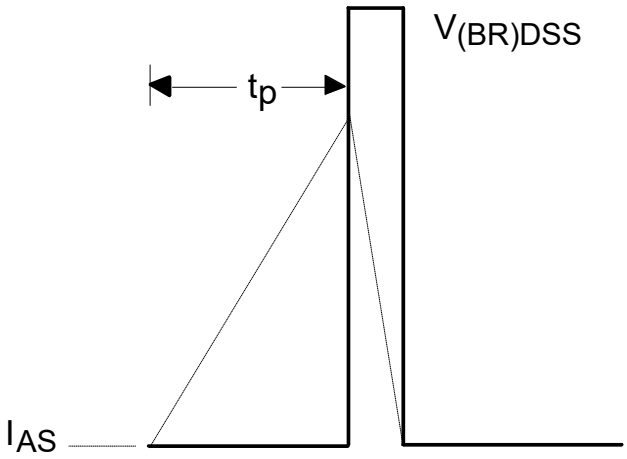


Fig 12b. Unclamped Inductive Waveforms

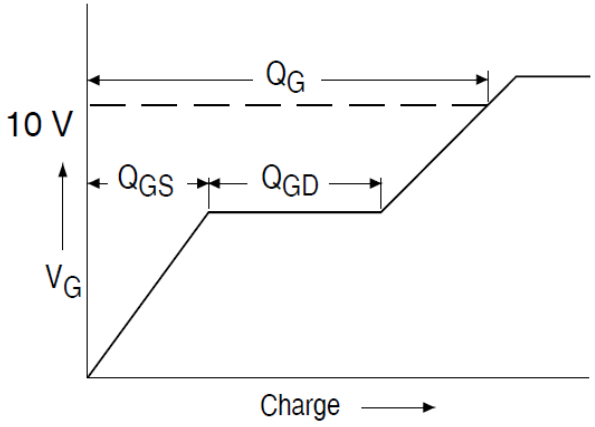


Fig 13a. Gate Charge Waveform

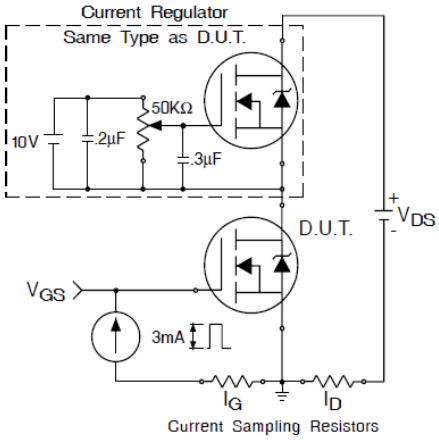


Fig 13b. Gate Charge Test Circuit

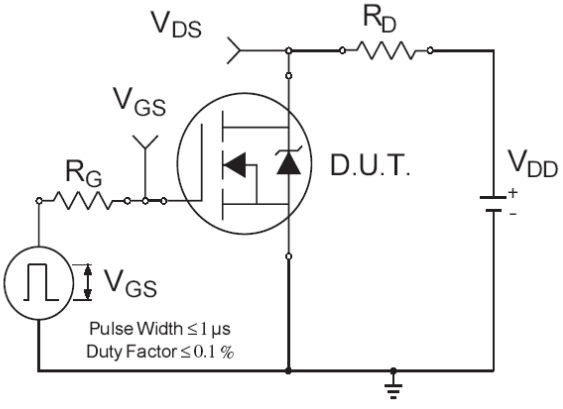


Fig 14a. Switching Time Test Circuit

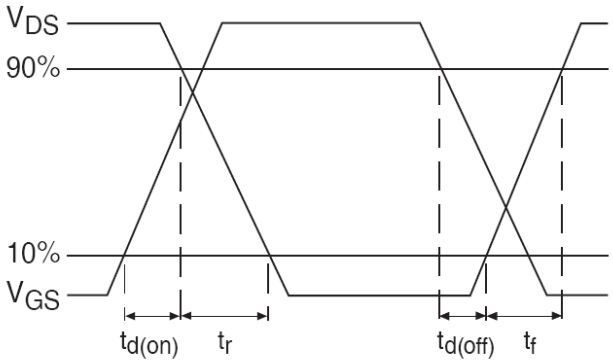
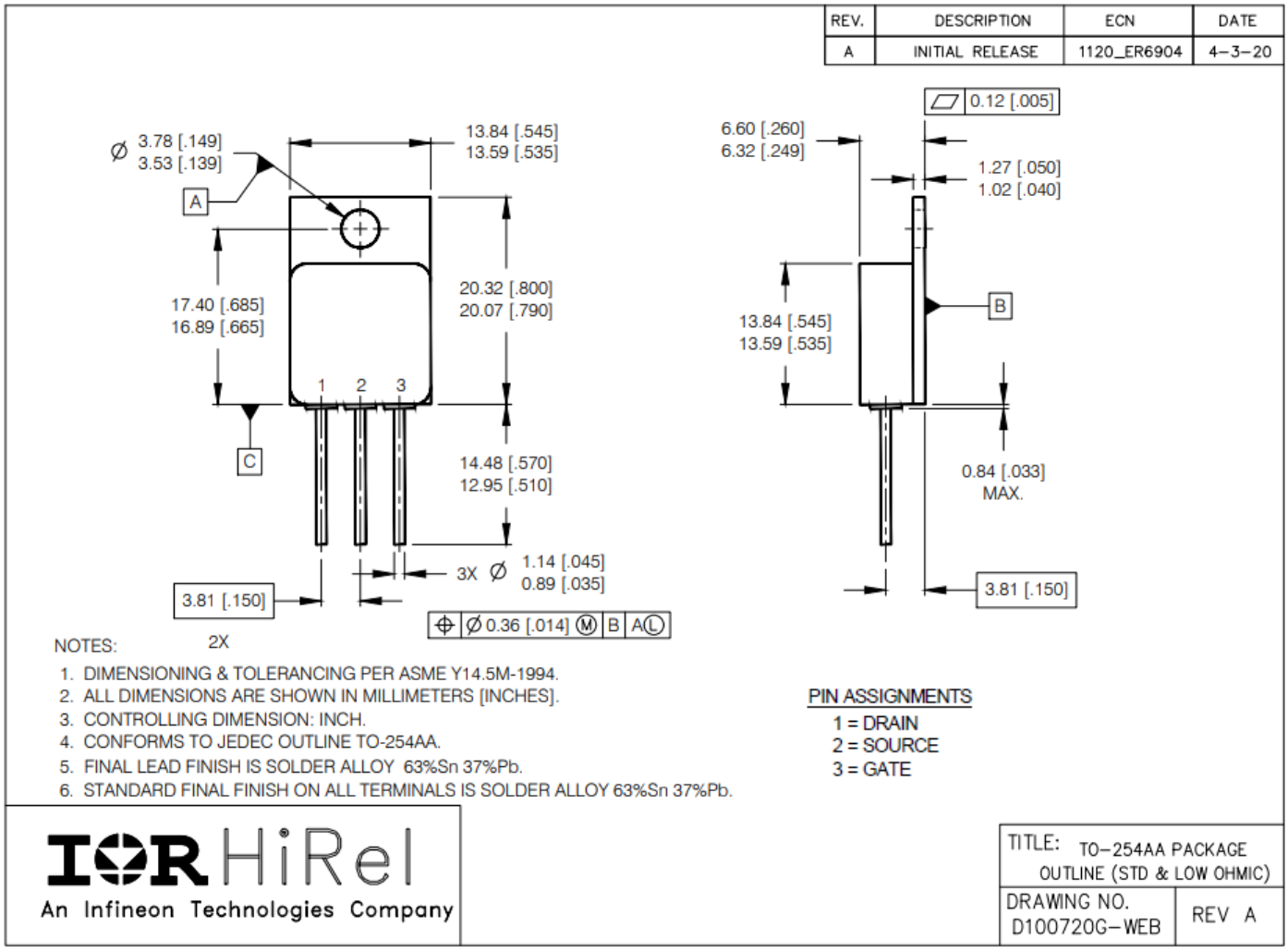


Fig 14b. Switching Time Waveforms

Note: For the most updated package outline, please see the website: TO-254AA

Case Outline and Dimensions - Low-Ohmic TO-254AA



BERYLLIA WARNING PER MIL-PRF-19500

Package containing beryllia shall not be ground, sandblasted, machined, or have other operations performed on them which will produce beryllia or beryllium dust. Furthermore, beryllium oxide packages shall not be placed in acids that will produce fumes containing beryllium.

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