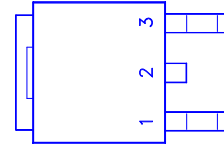
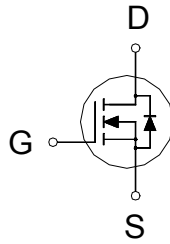


PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D
40V	10mΩ	55A



- 1. GATE
- 2. DRAIN
- 3. SOURCE

100% Rg tested
100% UIS tested

ABSOLUTE MAXIMUM RATINGS (T_A = 25 °C Unless Otherwise Noted)

PARAMETERS/TEST CONDITIONS		SYMBOL	LIMITS	UNITS
Drain-Source Voltage		V_{DS}	40	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	T _C = 25 °C	I_D	55	A
	T _C = 70 °C		44	
Pulsed Drain Current ¹		I_{DM}	120	
Avalanche Current		I_{AS}	38	
Avalanche Energy ²	L = 0.1mH	E_{AS}	73	mJ
Power Dissipation	T _C = 25 °C	P_D	50	W
	T _C = 70 °C		32	
Junction & Storage Temperature Range		T _J , T _{stg}	-55 to 150	°C

THERMAL RESISTANCE RATINGS

THERMAL RESISTANCE	SYMBOL	TYPICAL	MAXIMUM	UNITS
Junction-to-Ambient	R _{θJA}		62.5	°C / W
Junction-to-Case	R _{θJC}		2.5	

¹Pulse width limited by maximum junction temperature.

²V_{DD} = 20V . Starting T_J = 25°C.

ELECTRICAL CHARACTERISTICS (T_J = 25 °C, Unless Otherwise Noted)

PARAMETER	SYMBOL	TEST CONDITIONS	LIMITS			UNIT
			MIN	TYP	MAX	
STATIC						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	40			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	1.7	2.0	3.0	V
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0V, V_{GS} = \pm 20V$			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 32V, V_{GS} = 0V$			1	μA
		$V_{DS} = 30V, V_{GS} = 0V, T_J = 55 °C$			10	

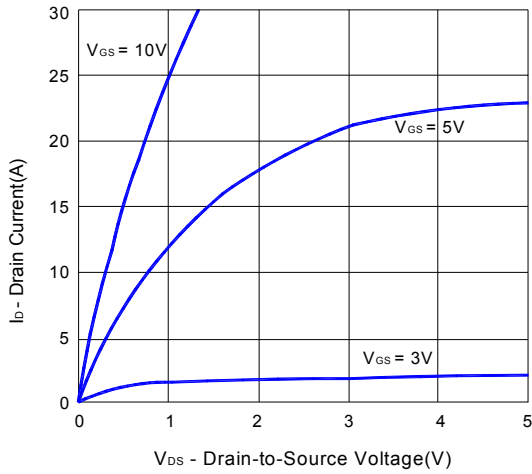
Drain-Source On-State Resistance ¹	$R_{DS(ON)}$	$V_{GS} = 5V, I_D = 8A$	13	17	mΩ
		$V_{GS} = 10V, I_D = 15A$	8	10	
Forward Transconductance ¹	g_{fs}	$V_{DS} = 10V, I_D = 20A$	25		S
On-State Drain Current ¹	$I_{D(ON)}$	$V_{DS} = 10V, V_{GS} = 10V,$	120		A
DYNAMIC					
Input Capacitance	C_{iss}	$V_{GS} = 0V, V_{DS} = 20V, f = 1MHz$	1550	1750	pF
Output Capacitance	C_{oss}		280	310	
Reverse Transfer Capacitance	C_{rss}		185	200	
Gate Resistance	R_g	$V_{GS} = 15mV, V_{DS} = 0V, f = 1MHz$	1.5	2.5	Ω
Total Gate Charge ²	Q_g	$V_{DS} = 0.5V_{(BR)DSS}, V_{GS} = 10V,$ $I_D = 20A$	26	32	nC
Gate-Source Charge ²	Q_{gs}		6	8.5	
Gate-Drain Charge ²	Q_{gd}		8	10	
Turn-On Delay Time ²	$t_{d(on)}$	$V_{DS} = 20V, R_L = 1Ω$ $I_D ≅ 20A, V_{GS} = 10V, R_{GEN} = 6Ω$	12	33	nS
Rise Time ²	t_r		35	65	
Turn-Off Delay Time ²	$t_{d(off)}$		37		
Fall Time ²	t_f		12	23	
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_J = 25 °C)					
Continuous Current	I_S			38	A
Forward Voltage ¹	V_{SD}	$I_F = 15A, V_{GS} = 0V$	0.7	1.3	V
Reverse Recovery Time	t_{rr}	$I_F = 20A, di_F/dt = 100A / μS$	75		nS
Reverse Recovery Charge	Q_{rr}		55		nC

¹Pulse test : Pulse Width ≤ 300 μsec, Duty Cycle ≤ 2%.

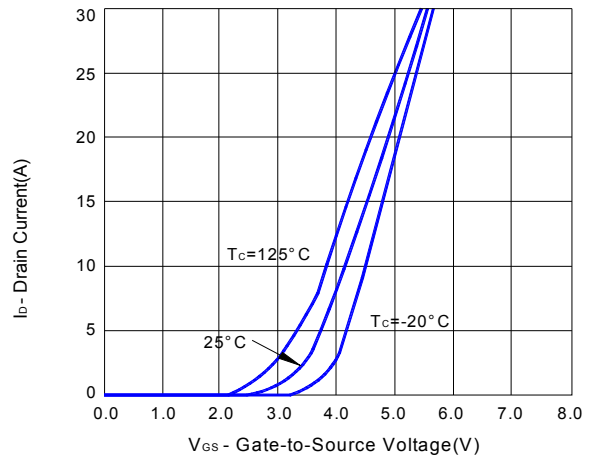
²Independent of operating temperature.

REMARK: THE PRODUCT MARKED WITH “P1004BD”, DATE CODE or LOT #

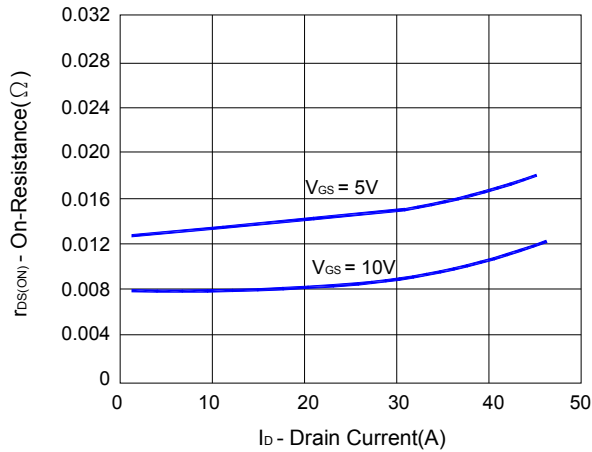
Output Characteristics



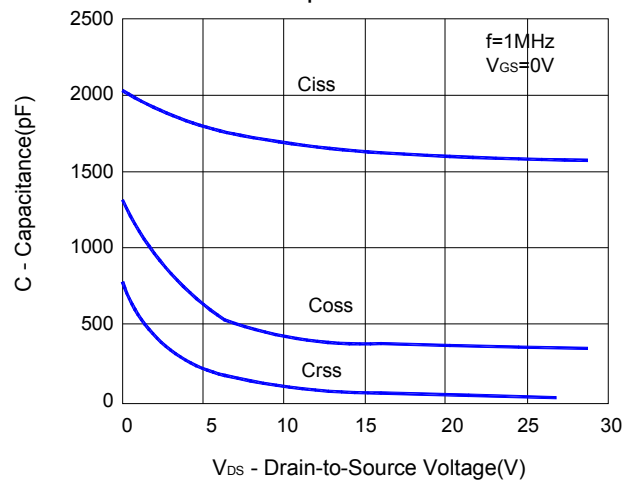
Transfer Characteristics



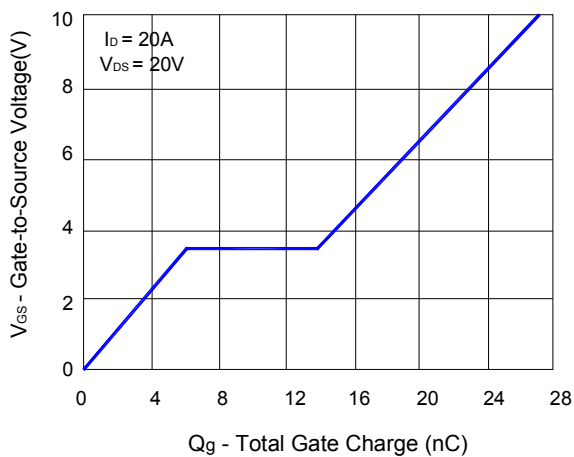
On-Resistance vs. Drain Current



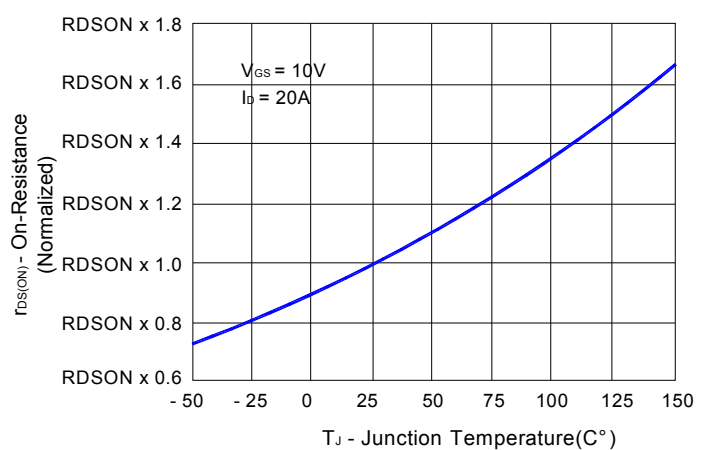
Capacitance



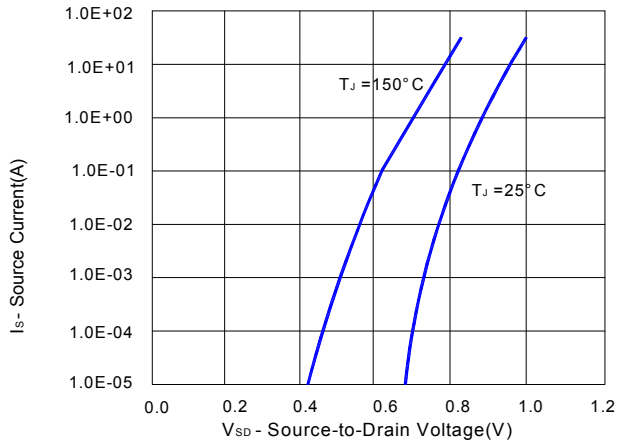
Gate Charge



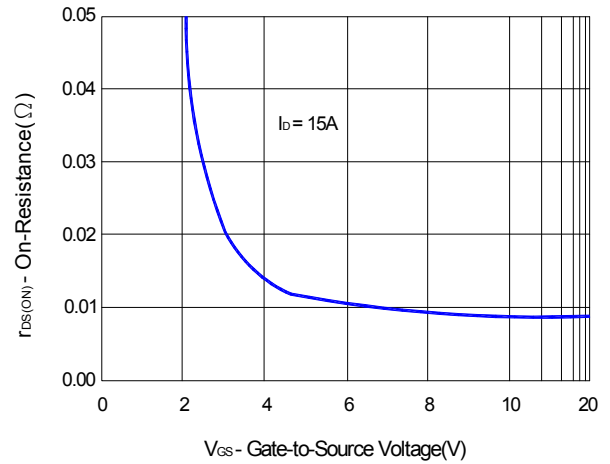
On-Resistance vs. Junction Temperature



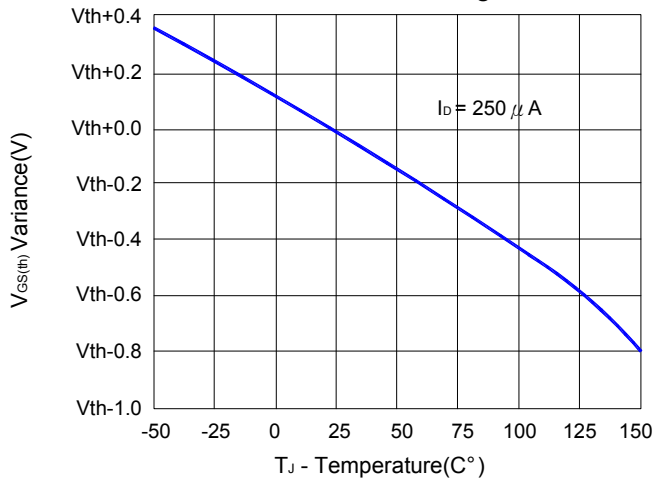
Source - Drain Diode Forward Voltage



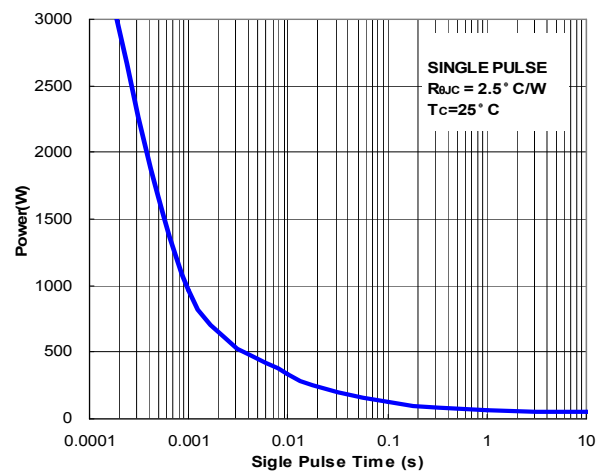
On-Resistance vs. Gate-to-Source Voltage



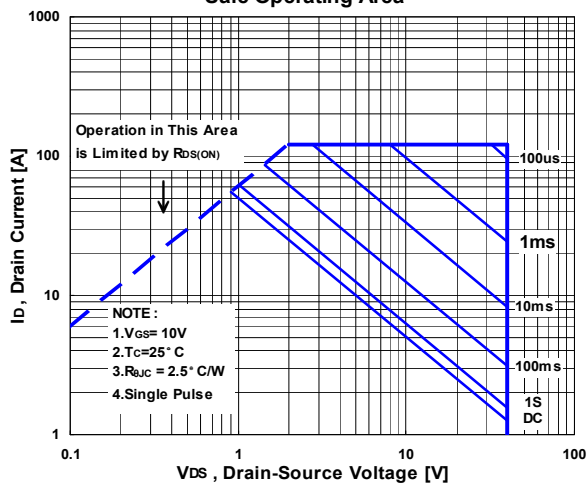
Threshold Voltage

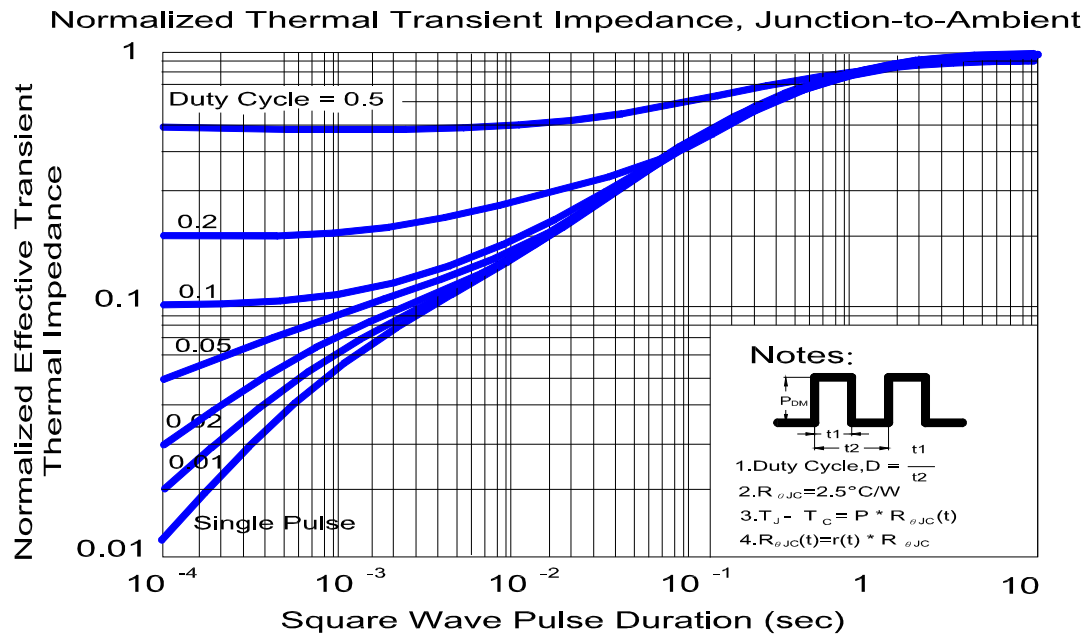


Single Pulse Maximum Power dissipation



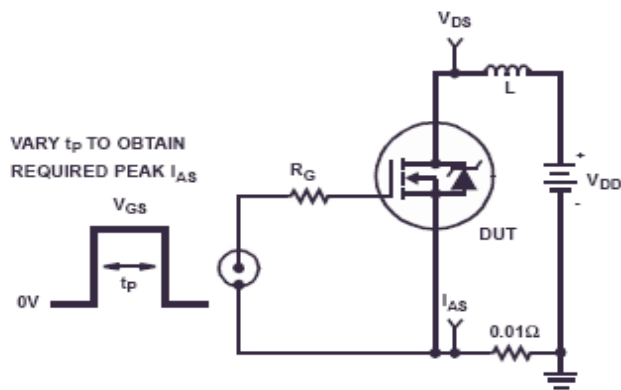
Safe Operating Area



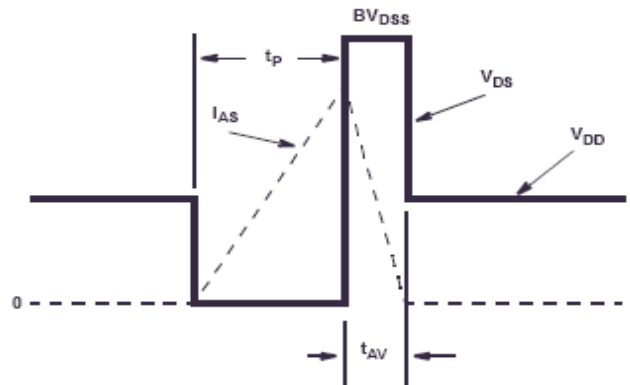


Test Circuits and Waveforms

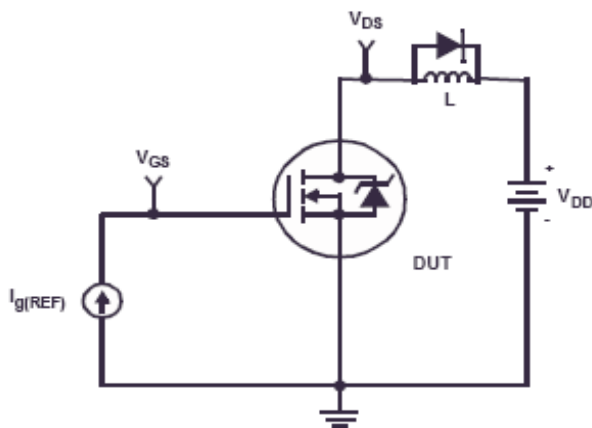
Unclamped Energy Test Circuit



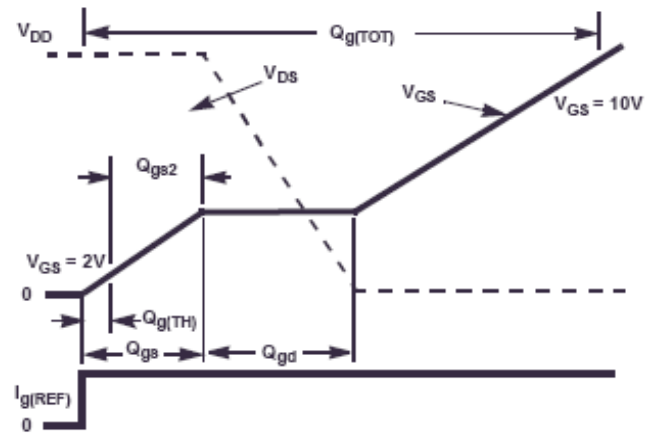
Unclamped Energy Waveforms



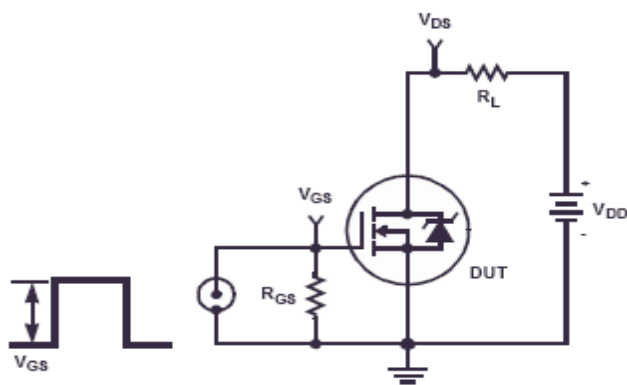
Gate Charge Test Circuit



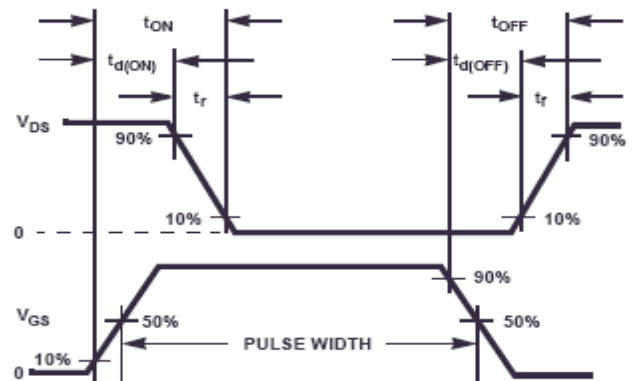
Gate Charge Waveforms



Switching Time Test Circuit



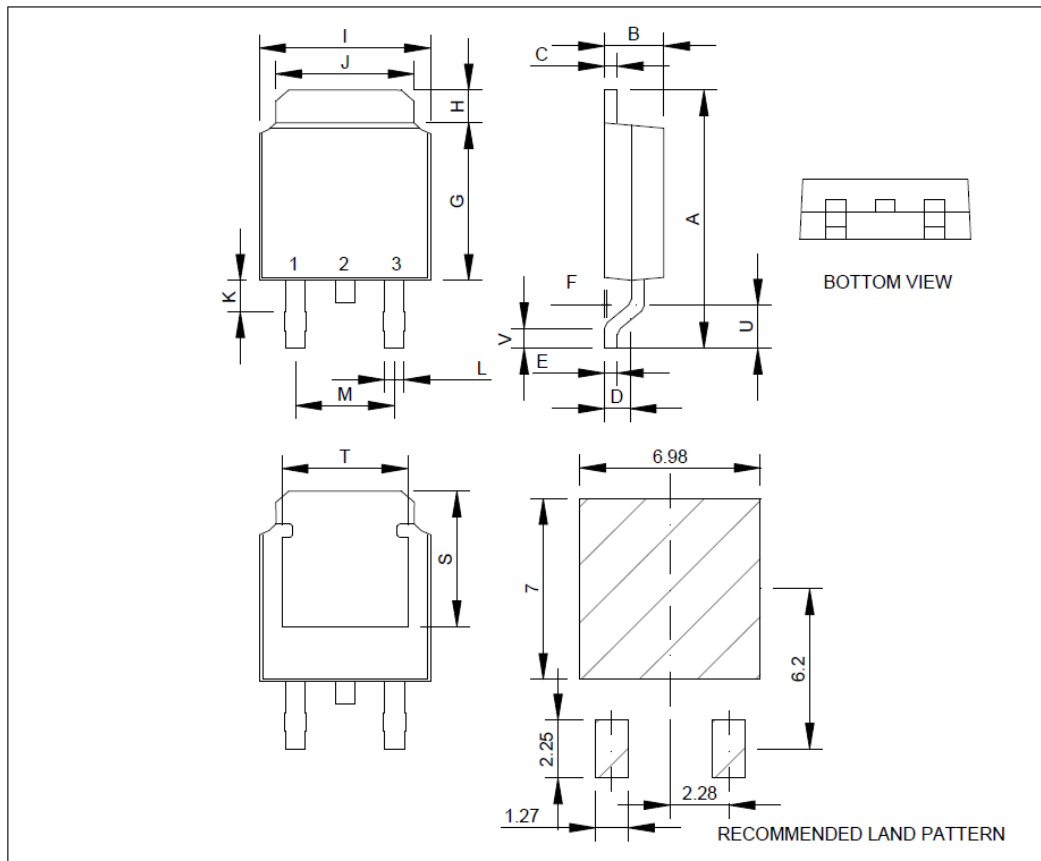
Switching Time Waveforms



Package Dimension

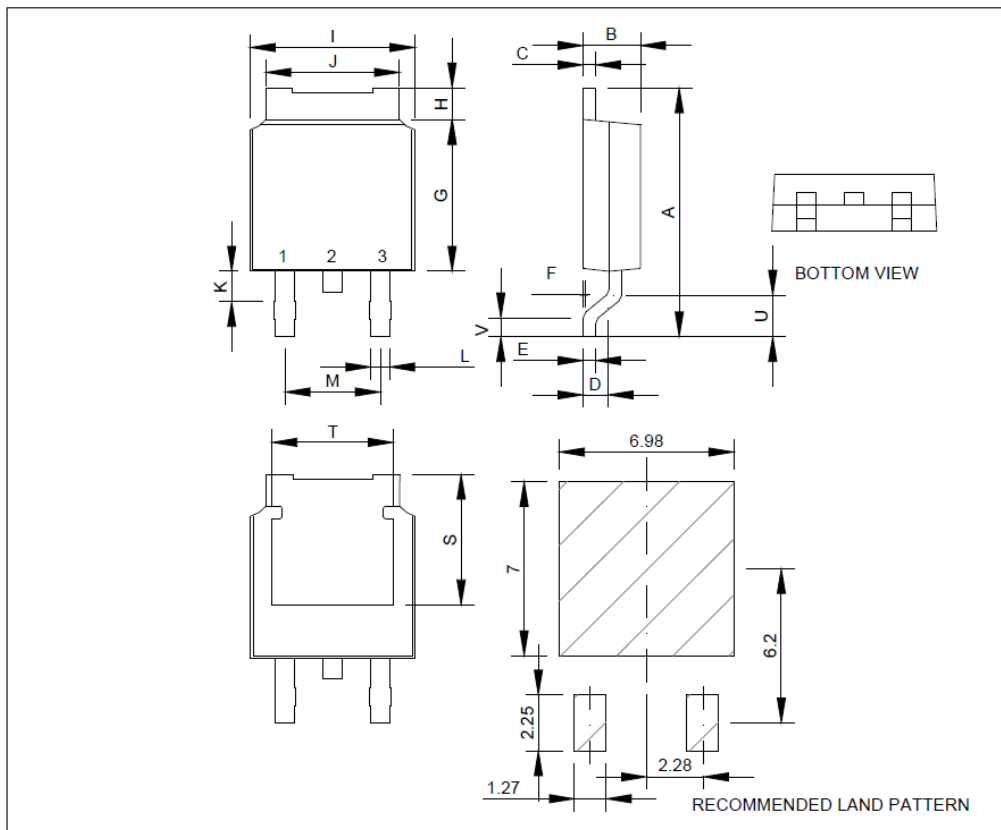
TO-252 (DPAK) MECHANICAL DATA

Dimension	mm			Dimension	mm		
	Min.	Typ.	Max.		Min.	Typ.	Max.
A	9.2		10.2	J	4.8		5.5
B	2.1		2.5	K	0.5		1.1
C	0.4		0.6	L	0.30		0.889
D	1.1		1.3	M	4.58		4.8
E		0.508		S	4.57		5.515
F	0		0.3	T	3.81		5.0
G	5.3		6.2	U	1.4		1.77
H	1.1		1.7	V	0.86		1.5
I	6.3		6.8				



TO-252 (DPAK) MECHANICAL DATA

Dimension	mm			Dimension	mm		
	Min.	Typ.	Max.		Min.	Typ.	Max.
A	8.9	9.5	10.4	J	5.04	5.34	5.64
B	2.2	2.3	2.4	K	0.6		1.0
C	0.4	0.5	0.6	L	0.66	0.76	0.86
D	0.82	1.02	1.22	M	4.372	4.572	4.772
E	0.4	0.5	0.6	S	5.25		
F	0		0.1	T	4.7		5.24
G	5.9	6.1	6.3	U	1.34		1.7
H	0.5		1.25	V	0.55		0.95
I	6.4	6.6	6.8				



TO-252 (DPAK) MECHANICAL DATA all

Dimension	mm			Dimension	mm		
	Min.	Typ.	Max.		Min.	Typ.	Max.
A	9.65		10.41	J	5.21		5.46
B	2.19		2.38	K	0.64		1.01
C	0.46		0.64	L	0.64		0.89
E	0.51			M		4.58	
F			0.13	S	5.21		
G	5.97		6.22	T	4.83		
H	0.89		1.27	U	1.4		1.78
I	6.35		6.73	V	0.75		1.00

