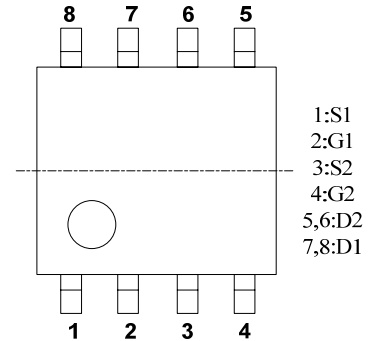




### General Description

The AM4502C uses advanced trench technology to provide excellent  $R_{DS(ON)}$  and low gate charge. This device is suitable for used as DC-DC converters and power managements in portable and battery-powered products.



### Features

- N-Channel:  $V_{DS} (V) = 30V$   
P-Channel:  $V_{DS} (V) = -30V$

- Low on-state resistance

N-Channel:

$$R_{DS(on)} = 16 \text{ m}\Omega \text{ MAX (} V_{GS} = 10V, I_D = 10A)$$

$$R_{DS(on)} = 20 \text{ m}\Omega \text{ MAX (} V_{GS} = 4.5V, I_D = 8.4A)$$

P-Channel:

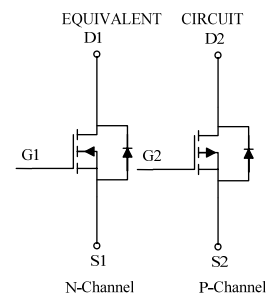
$$R_{DS(on)} = 23 \text{ m}\Omega \text{ MAX (} V_{GS} = -10V, I_D = -8.5A)$$

$$R_{DS(on)} = 33 \text{ m}\Omega \text{ MAX (} V_{GS} = -4.5V, I_D = -6.8A)$$

- Fast switching speed

### Absolute Maximum Ratings ( $T_a = 25^\circ\text{C}$ )

PARAMETER	SYMBOL	N-Channel	P-Channel	UNIT
Drain to Source Voltage	$V_{DSS}$	30	-30	V
Gate to Source Voltage	$V_{GSS}$	20	-25	V
Drain Current (DC) <sup>a</sup>	$T_A=25^\circ\text{C}$	10	-8.5	A
	$T_A=70^\circ\text{C}$	8.1	-6.8	
Drain Current (pulse) <sup>b</sup>	$I_{D(pulse)}$	$\pm 50$	$\pm 50$	A
Continuous Source Current (Diode Conduction) <sup>a</sup>	$I_S$	2.3	-2.1	A
Total Power Dissipation <sup>a</sup>	$T_A=25^\circ\text{C}$	2.1	2.1	W
	$T_A=70^\circ\text{C}$	1.3	1.3	
Channel Temperature	$T_{ch}$	150		$^\circ\text{C}$
Operating Junction and Storage Temperature Range	$T_{stg}$	-55~+150		$^\circ\text{C}$



THERMAL RESISTANCE RATINGS				
Parameter		Symbol	Maximum	Units
Maximum Junction-to-Ambient	$t \leq 10\text{sec}$	$R_{\theta JA}$	62.5	$^\circ\text{C/W}$
	Steady State		110	$^\circ\text{C/W}$

**Note a.** Mounted on FR4 Board of 1"x1".

**b.** Pulse width limited by maximum junction temperature

**Caution:** These values must not be exceeded under any conditions.



## Ordering Information

- Part Number: AM4502C
- Package: SOIC8

Electrical Characteristics ( $T_A = 25^\circ\text{C}$ )

CHARACTERISTIC	SYMBOL	TEST CONDITION	Ch	MIN	TYP	MAX	UNIT
Gate Cut-off Voltage	$V_{GSS(off)}$	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$	N	1			V
		$V_{DS}=V_{GS}, I_D=-250\mu\text{A}$	P	-1			
Gate-Body Leakage	$I_{GSS}$	$V_{DS}=0\text{V}, V_{GS}=20\text{V}$	N			$\pm 100$	nA
		$V_{DS}=0\text{V}, V_{GS}=-20\text{V}$	P			$\pm 100$	
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=24\text{V}, V_{GS}=0\text{V}$	N			1	uA
		$V_{DS}=-24\text{V}, V_{GS}=0\text{V}$	P			-1	
On-State Drain Current	$I_{D(on)}$	$V_{DS}=5\text{V}, V_{GS}=10\text{V}$	N	20			A
		$V_{DS}=-5\text{V}, V_{GS}=-10\text{V}$	P	-50			
Drain -Source On-Resistance	$r_{DS(on)}$	$V_{GS}=10\text{V}, I_D=10\text{A}$	N			16	m $\Omega$
		$V_{GS}=4.5\text{V}, I_D=8.4\text{A}$				20	
		$V_{GS}=-10\text{V}, I_D=-8.5\text{A}$	P			23	
		$V_{GS}=-4.5\text{V}, I_D=-6.8\text{A}$				33	
Forward Transconductance	$g_{fs}$	$V_{DS}=15\text{V}, I_D=10\text{A}$	N		40		S
		$V_{DS}=-15\text{V}, I_D=-9.5\text{A}$	P		31		
Pulsed Source Current (Body Diode)	$I_{SM}$				5		A
Total Gate Charge	$Q_g$	N-Channel $V_{DS}=15\text{V}, V_{GS}=4.5\text{V},$ $I_D=10\text{A}$	N		12		nC
			P		13		
Gate-Source Charge	$Q_{gs}$	P-Channel $V_{DS}=-15\text{V}, V_{GS}=-4.5\text{V},$ $I_D=-10\text{A}$	N		3.3		
			P		5.8		
Gate-Drain Charge	$Q_{gd}$		N		4.5		
			P		12		
Turn-On Delay Time	$t_{d(on)}$	N-Channel $V_{DD}=15\text{V}, V_{GS}=10\text{V}, I_D=1$ $\text{A}, R_{GEN}=25\Omega$	N		20		nS
			P		15		
Rise Time	$t_r$	P-Channel $V_{DD}=-15\text{V}, V_{GS}=-10\text{V},$ $I_D=-1\text{A}, R_{GEN}=15\Omega$	N		9		
			P		16		
Turn-Off Delay Time	$t_{d(off)}$		N		70		
			P		62		
Fall-Time	$t_f$		N		20		
			P		46		

Typical characteristics (25°C unless noted)

Typical Electrical Characteristics(P-Channel)

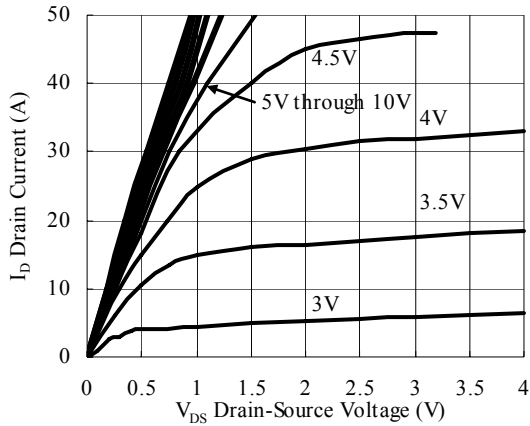


Figure 1. On-Region Characteristics

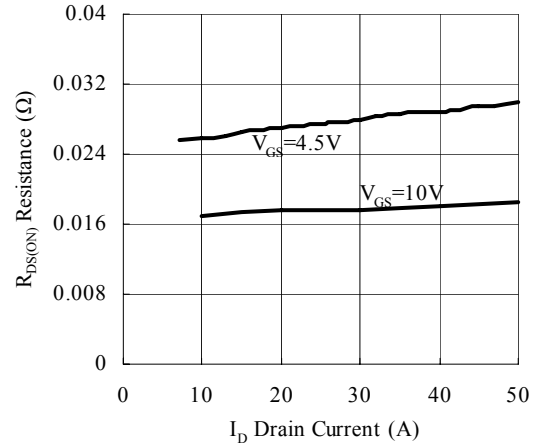


Figure 2. On-Resistance with Drain Current

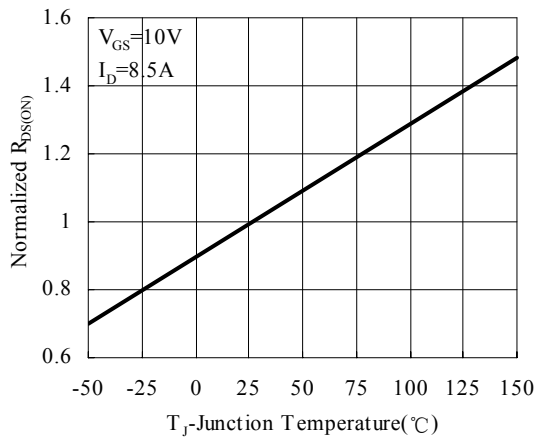


Figure 3. On-Resistance Variations With Temperature

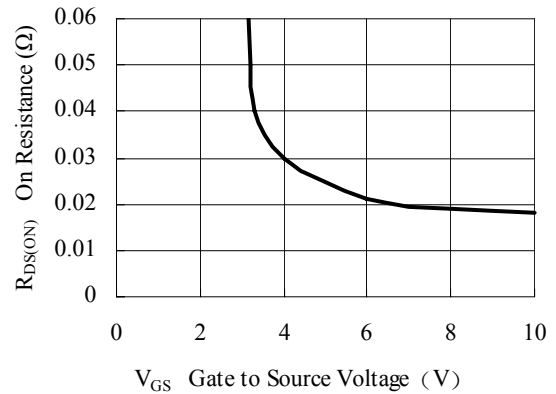


Figure 4. On-Resistance Variation VS Gate to Source Voltage

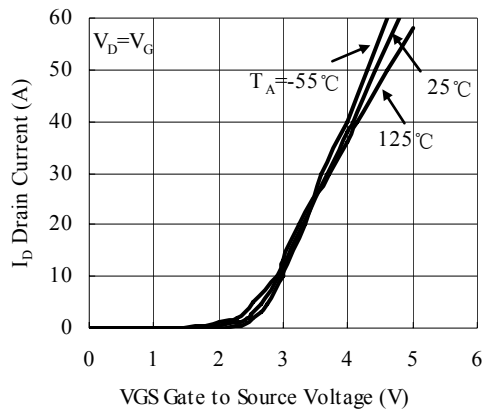


Figure 5. Transfer Characteristics

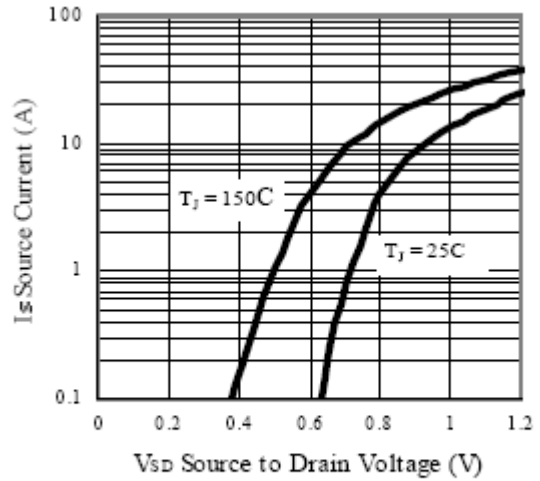


Figure 6. Body Diode Forward Voltage Variation with Source Current and Temperature

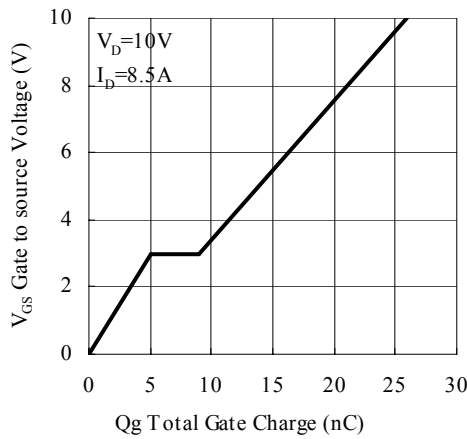


Figure 7. Gate Charge Characteristic

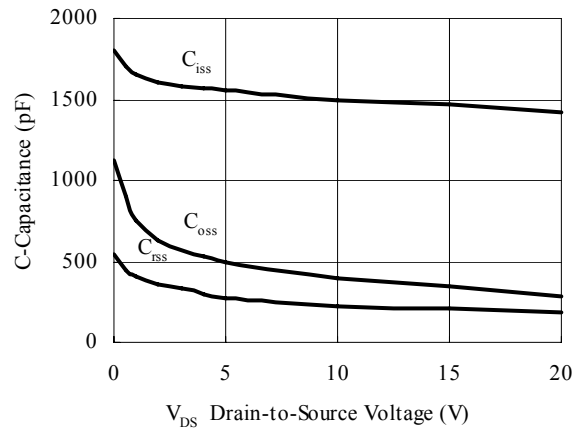


Figure 8. Capacitance Characteristics

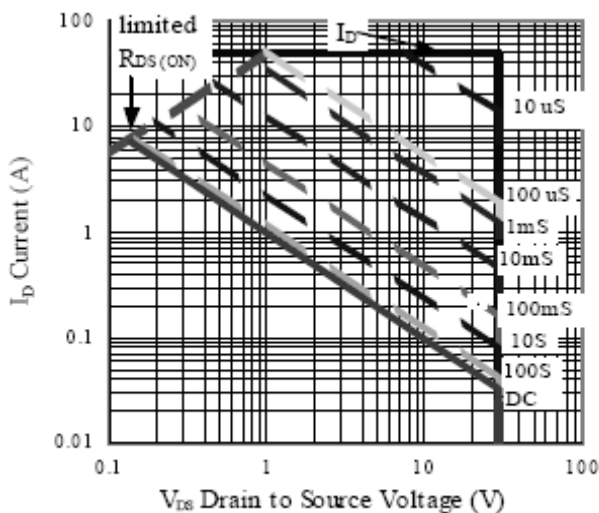


Figure 9. Maximum Safe Operating Area

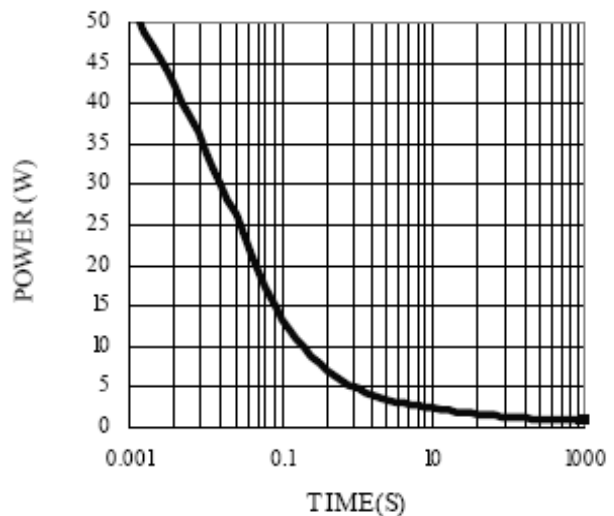


Figure 10. Single Pulse Maximum Power Dissipation

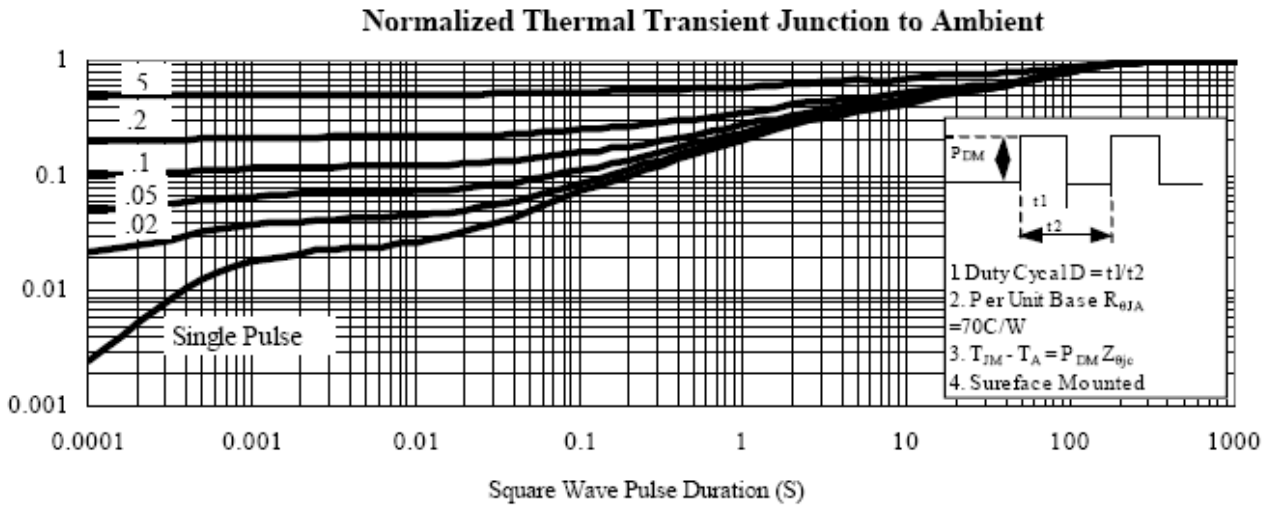


Figure 11. Transient Thermal Response Curve

### Typical Electrical Characteristics(N-Channel)

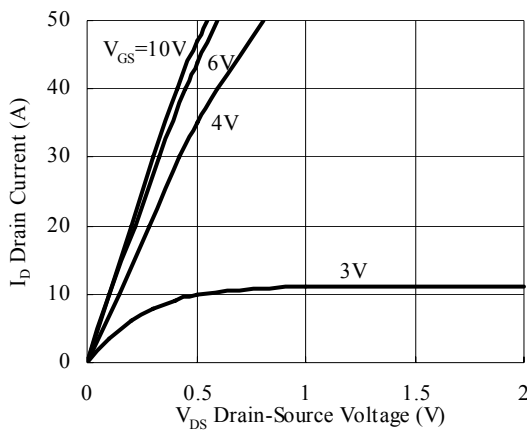


Figure 1. On-Region Characteristics

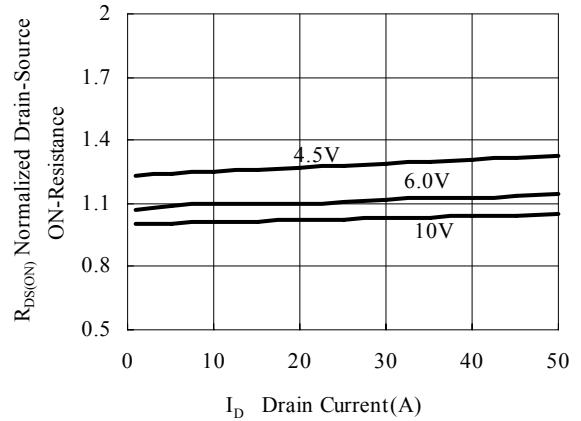


Figure 2. On-Resistance ws Drain Current

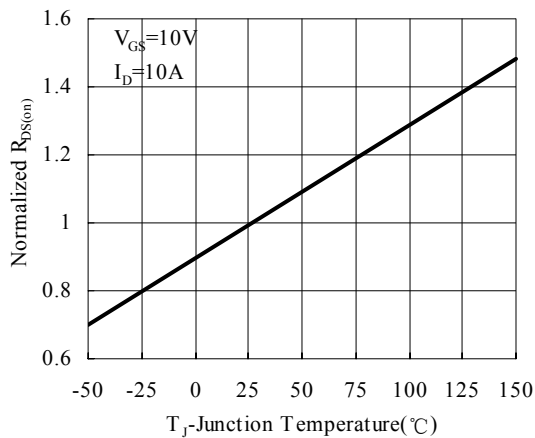


Figure 3. On-Resistance Variations With Temperature

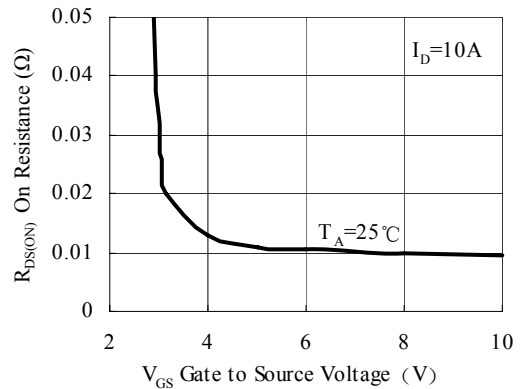


Figure 4. On-Resistance Variation VS Gate to Source Voltage

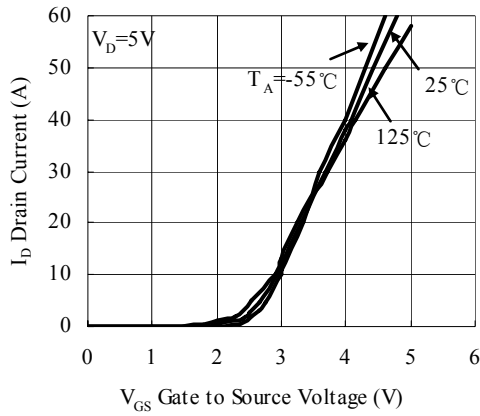


Figure 5. Transfer Characteristics

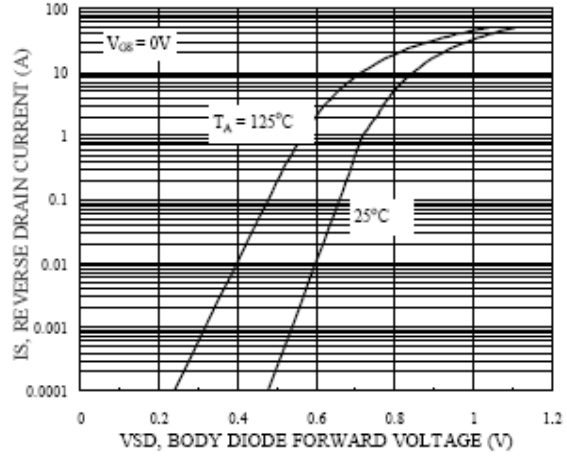


Figure 6. Body Diode Forward Voltage Variation with Source Current and Temperature

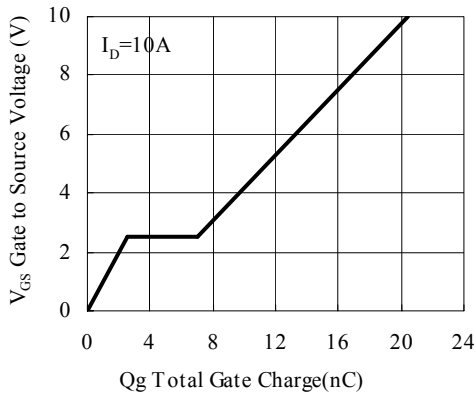


Figure 7. Gate Charge Characteristic

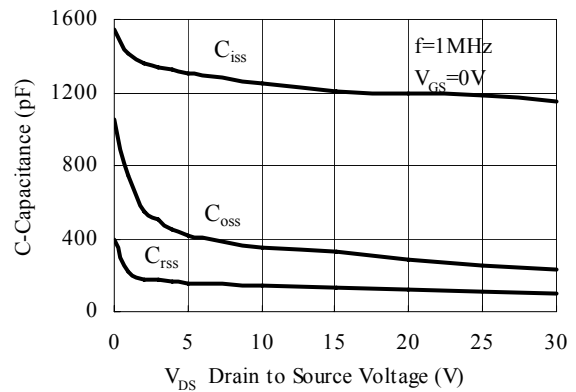


Figure 8. Capacitance Characteristics

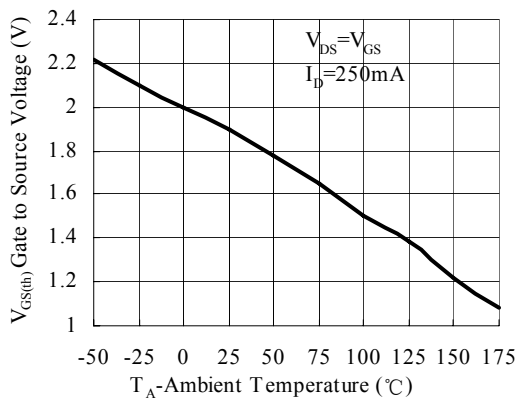


Figure 9. Threshold VS Ambient Temperature

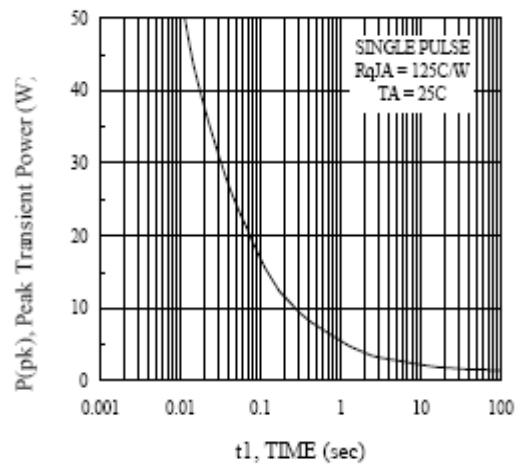
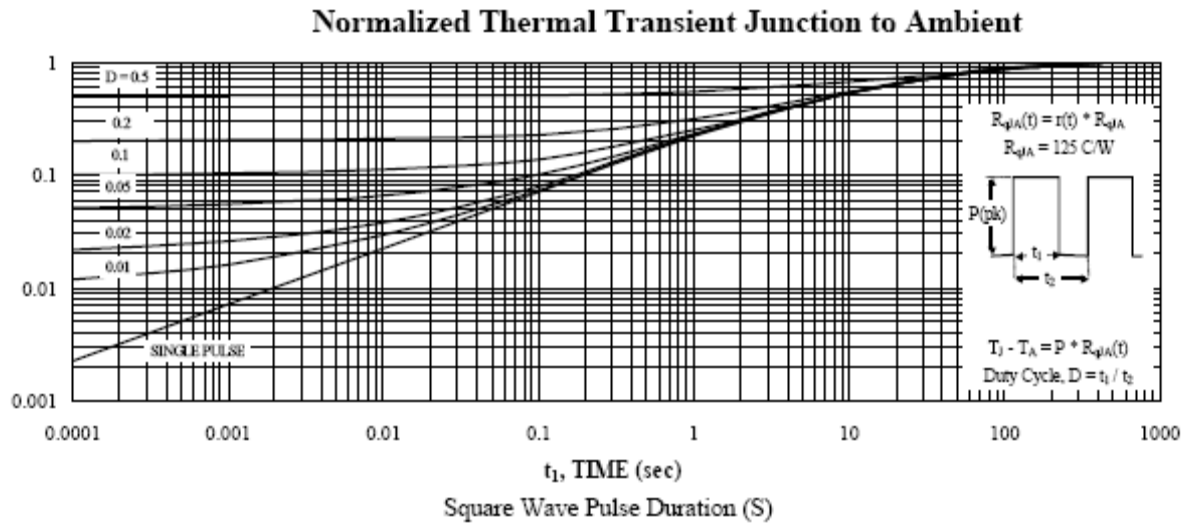


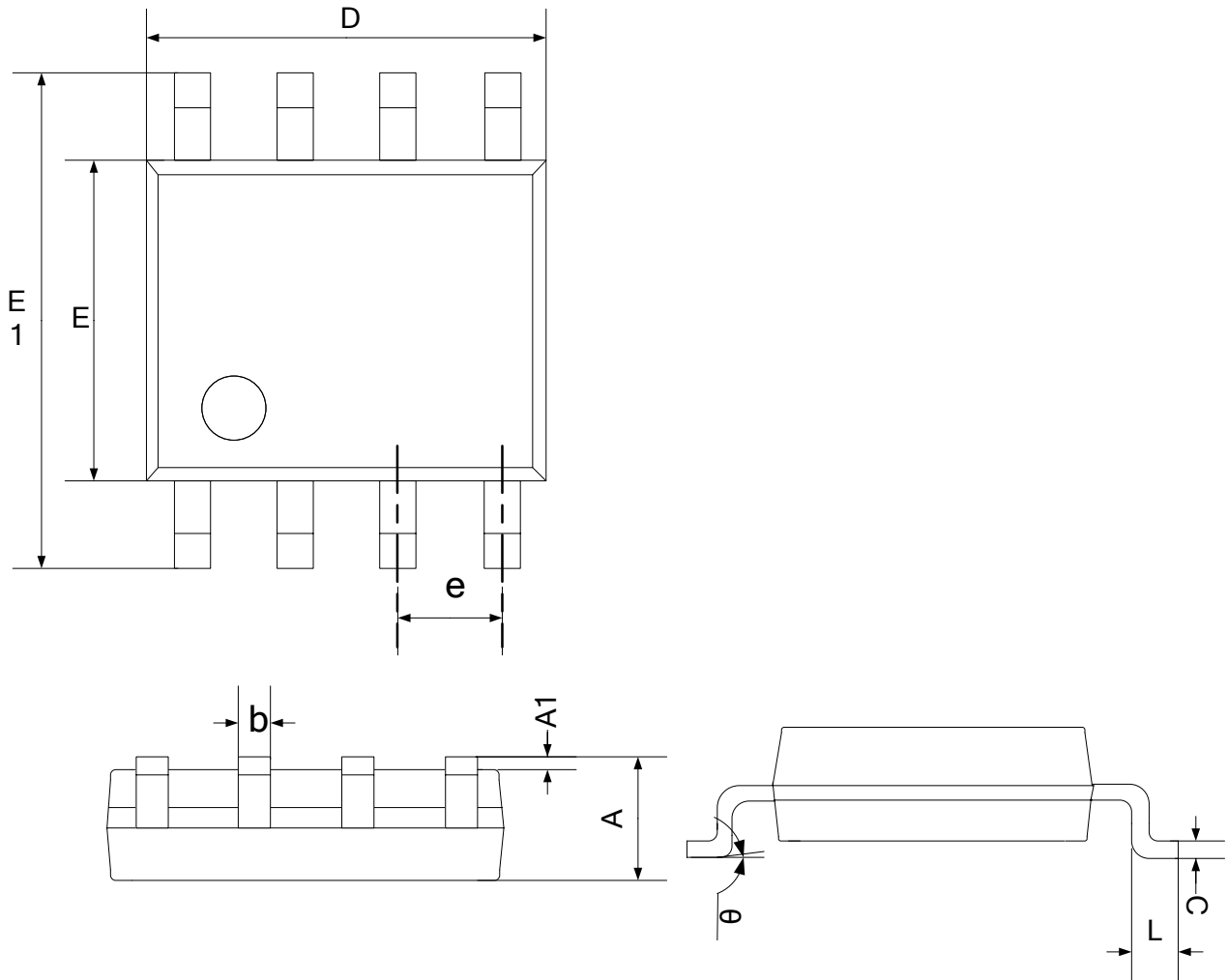
Figure 10. Single Pulse Maximum Power Dissipation



Package Drawing

SOIC8

UNIT (mm)



Dimensions

	D	E	A	E1	A1	C	L	b	e	$\theta$
Min.	4.80	3.80	1.35	5.80	0.100	0.19	0.500	0.380	1.27 BSC	0°
Nom.	4.90	3.90	1.55	6.00	0.175	0.22	0.715	0.445		4°
Max.	5.00	4.00	1.75	6.20	0.250	0.25	0.930	0.510		8°