Elektronische Bauelemente

SSG4502C

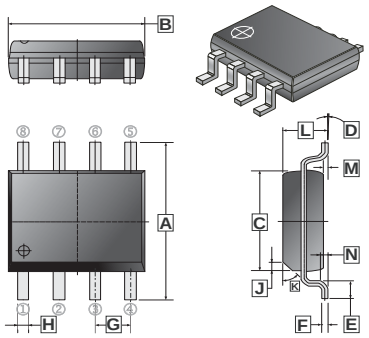
N-Ch: 10 A, 30 V, $R_{DS(ON)}$ 16 mΩ
P-Ch: -8.5 A, -30 V, $R_{DS(ON)}$ 23 mΩ
N & P-Ch Enhancement Mode Power MOSFET

RoHS Compliant Product
A suffix of "-C" specifies halogen & lead-free

DESCRIPTION

These miniature surface mount MOSFETs utilize a high cell density trench process to provide low $R_{DS(on)}$ and to ensure minimal power loss and heat dissipation. Typical applications are DC-DC converters and power management in portable and battery-powered products such as computers,. printers, PCMCIA cards, cellular and cordless telephones

SOP-8



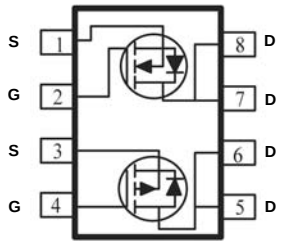
REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	5.8	6.20	H	0.35	0.51
B	4.80	5.00	J	0.375 REF.	
C	3.80	4.00	K	45°	
D	0°	8°	L	1.35	1.75
E	0.50	0.93	M	0.10	0.25
F	0.19	0.25	N	0.25 REF.	
G	1.27 TYP.				

FEATURES

- Low $R_{DS(on)}$ provides higher efficiency and extends battery life.
- Low thermal impedance copper leadframe SOP-8 saves board space
- Fast switching speed
- High performance trench technology

PACKAGE INFORMATION

Package	MPQ	LeaderSize
SOP-8	2.5K	13' inch



MAXIMUM RATINGS (T_A = 25°C unless otherwise specified)

Parameter	Symbol	N- Ch	P- Ch	Unit
Drain-Source Voltage	V_{DS}	30	-30	V
Gate-Source Voltage	V_{GS}	20	-20	V
Continuous Drain Current [1]	I_D @ T_A = 25°C	10	-8.5	A
	I_D @ T_A = 70°C	8.1	-6.8	A
Pulsed Drain Current [2]	I_{DM}	±50	±50	A
Continuous Source Current (Diode Conduction) [1]	I_S	2.3	-2.1	A
Total Power Dissipation [1]	P_D @ T_A = 25°C	2.1	2.1	W
	P_D @ T_A = 70°C	1.3	1.3	W
Operating Junction & Storage Temperature Range	T_J, T_{STG}	-55 ~ 150		°C
Thermal Resistance Ratings				
Maximum Junction-to-Ambient [1]	t≦ 10 sec	$R_{\theta JA}$	62.5	°C / W
	Steady State		110	°C / W

Notes:

1. Surface Mounted on 1" x 1" FR4 Board.
2. Pulse width limited by maximum junction temperature.

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise specified)

Parameter	Symbol	Ch	Min.	Typ.	Max.	Unit	Teat Conditions
Static							
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	N	30	-	-	V	V_{GS}= 0V, I_D= 250μA
		P	-30	-	-		V_{GS}= 0V, I_D= -250μA
Gate Threshold Voltage	$V_{GS(th)}$	N	1	-	-	V	V_{DS}= V_{GS}, I_D= 250μA
		P	-1	-	-		V_{DS}= V_{GS}, I_D= -250μA
Gate-Body Leakage	I_{GSS}	N	-	-	±100	nA	V_{DS}= 0V, V_{GS}= 20V
		P	-	-	±100		V_{DS}= 0V, V_{GS}= -20V
Zero Gate Voltage Drain Current	I_{DSS}	N	-	-	1	μA	V_{DS}= 24V, V_{GS}= 0V
		P	-	-	-1		V_{DS}= -24V, V_{GS}= 0V
On-State Drain Current [1]	$I_{D(on)}$	N	20	-	-	A	V_{DS}= 5V, V_{GS}= 10V
		P	-50	-	-		V_{DS}= -5V, V_{GS}= -10V
Drain-Source On-Resistance [1]	$R_{DS(ON)}$	N	-	-	16	mΩ	V_{GS}= 10V, I_D= 10A
			-	-	20		V_{GS}= 4.5V, I_D= 8.4A
		P	-	-	23		V_{GS}= -10V, I_D= -8.5A
			-	-	33		V_{GS}= -4.5V, I_D= -6.8A
Forward Transconductance [1]	g_{fs}	N	-	40	-	S	V_{DS}= 15V, I_D= 10A
		P	-	31	-		V_{DS}= -15V, I_D= -9.5A
Dynamic [2]							
Total Gate Charge	Q_g	N	-	12	-	nC	N-Channel I_D= 10A, V_{DS}= 15V, V_{GS}= 4.5V P-Channel I_D= -10A, V_{DS}= -15V, V_{GS}= -4.5V
		P	-	13	-		
Gate-Source Charge	Q_{gs}	N	-	3.3	-		
		P	-	5.8	-		
Gate-Drain Charge	Q_{gd}	N	-	4.5	-		
		P	-	12	-		
Turn-On Delay Time	$T_{d(on)}$	N	-	20	-	nS	N-Channel V_{DD}= 15V, V_{GS}= 10V I_D= 1A, R_{GEN}= 25Ω P-Channel V_{DD}= -15V, V_{GS}= -10V I_D= -1A, R_{GEN}= 15Ω
		P	-	15	-		
Rise Time	T_r	N	-	9	-		
		P	-	16	-		
Turn-Off Delay Time	$T_{d(off)}$	N	-	70	-		
		P	-	62	-		
Fall Time	T_f	N	-	20	-		
		P	-	46	-		

Notes:

1. Pulse test : PW ≦ 300μs duty cycle ≦ 2%.
2. Guaranteed by design, not subject to production testing.

CHARACTERISTIC CURVES (N-Channel)

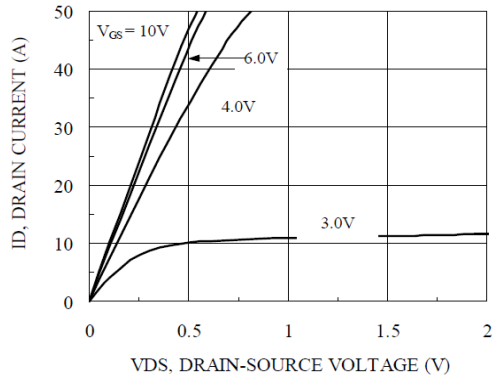


Figure 1. On-Region Characteristics

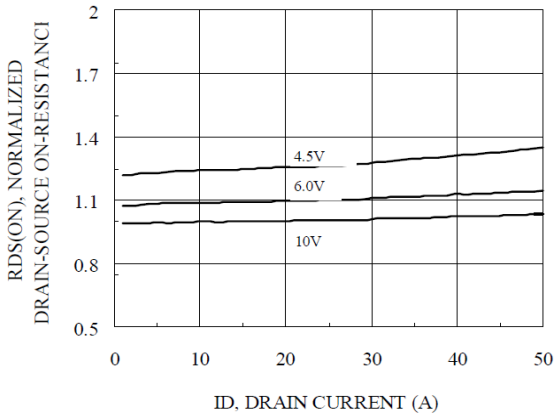


Figure 2. On-Resistance with Drain Current

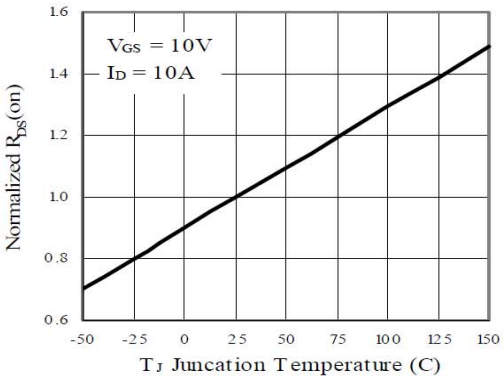


Figure 3. On-Resistance Variation with Temperature

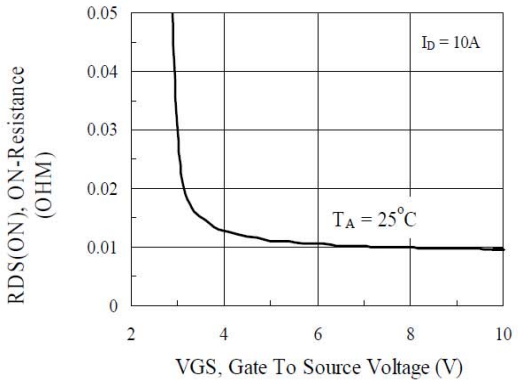


Figure 4. On-Resistance Variation with Gate to Source Voltage

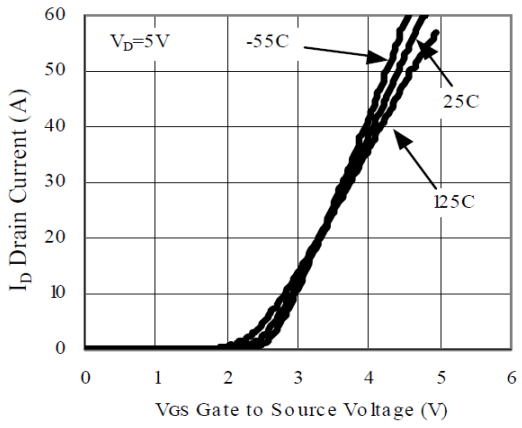


Figure 5. Transfer Characteristics

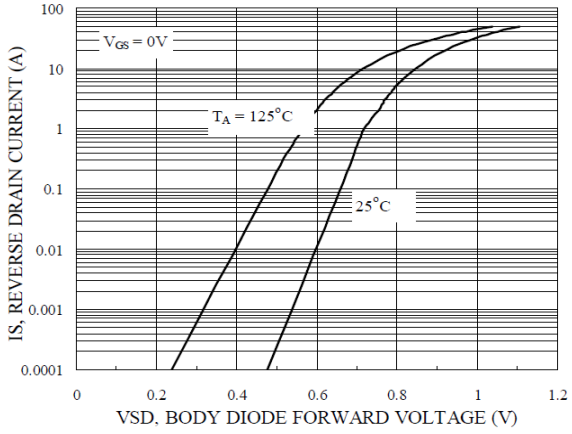


Figure 6. Body Diode Forward Voltage Variation with Source Current and Temperature

CHARACTERISTIC CURVES

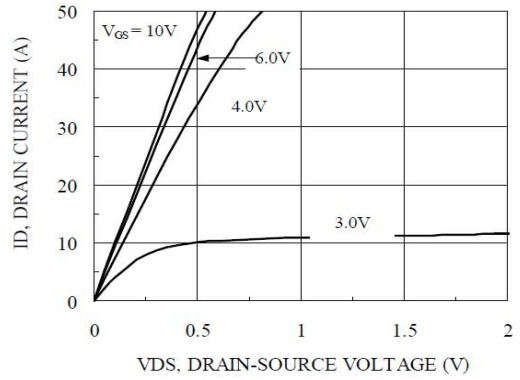


Figure 1. On-Region Characteristics

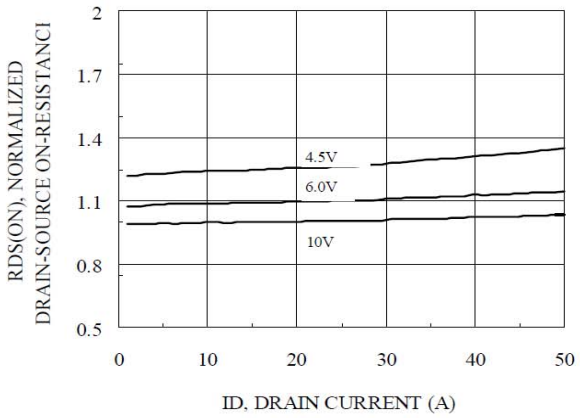


Figure 2. On-Resistance with Drain Current

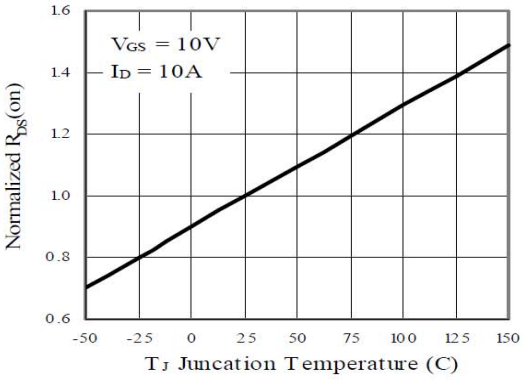


Figure 3. On-Resistance Variation with Temperature

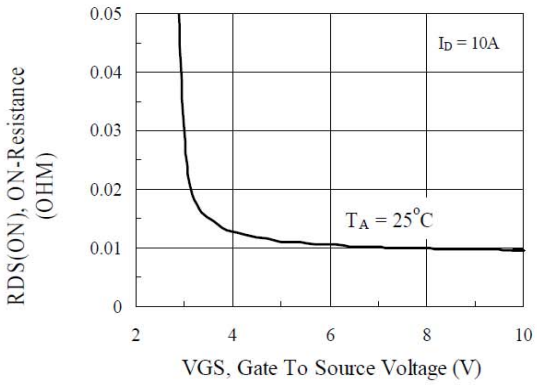


Figure 4. On-Resistance Variation with Gate to Source Voltage

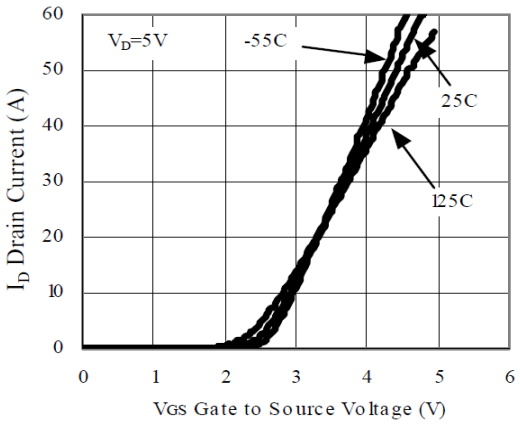


Figure 5. Transfer Characteristics

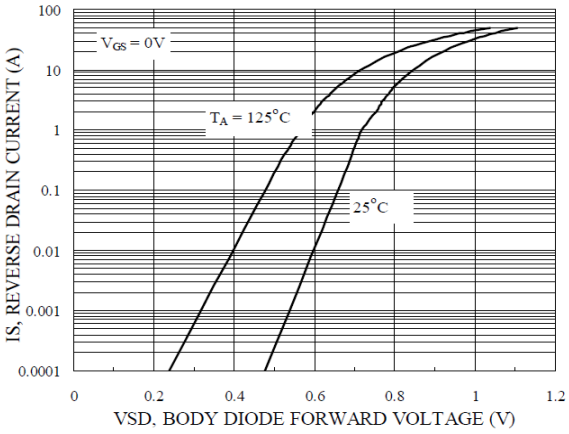


Figure 6. Body Diode Forward Voltage Variation with Source Current and Temperature

CHARACTERISTIC CURVES (P-Channel)

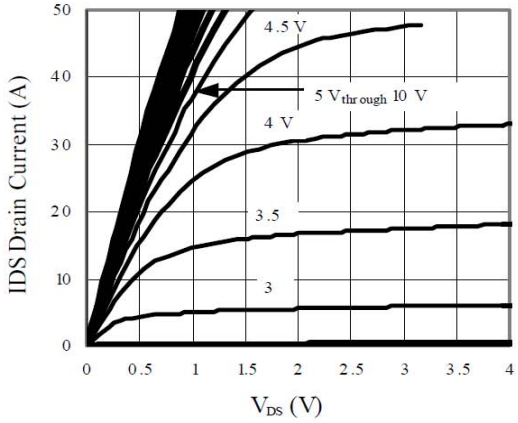


Figure 1. On-Region Characteristics

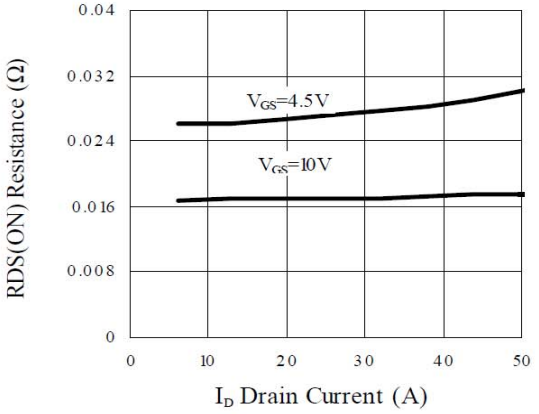


Figure 2. On-Resistance with Drain Current

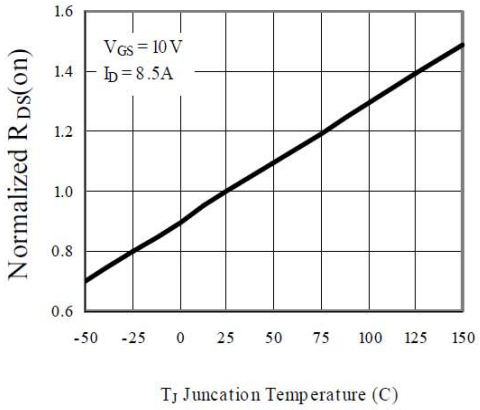


Figure 3. On-Resistance Variation with Temperature

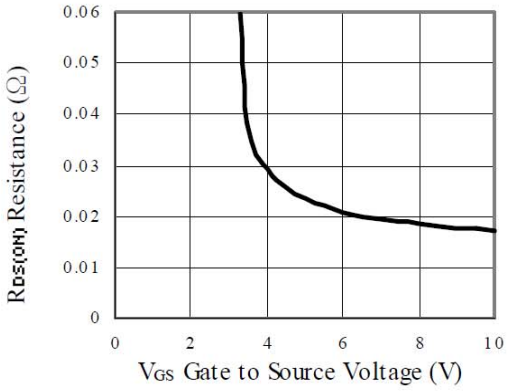


Figure 4. On-Resistance Variation with Gate to Source Voltage

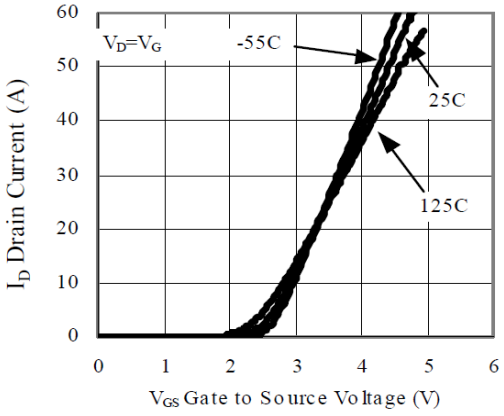


Figure 5. Transfer Characteristics

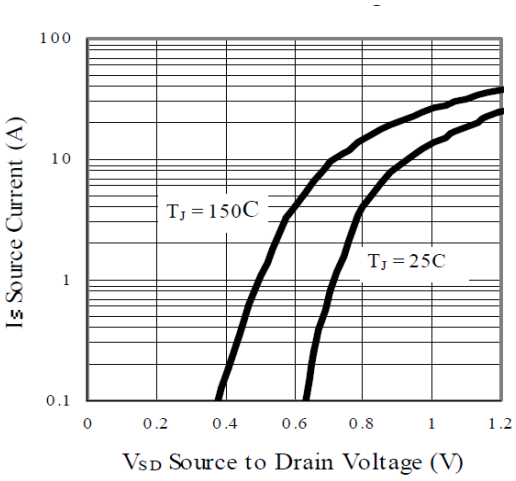


Figure 6. Body Diode Forward Voltage Variation with Source Current and Temperature

CHARACTERISTIC CURVES

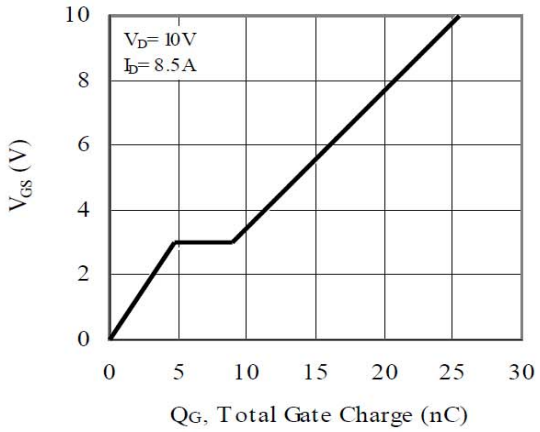


Figure 7. Gate Charge Characteristics

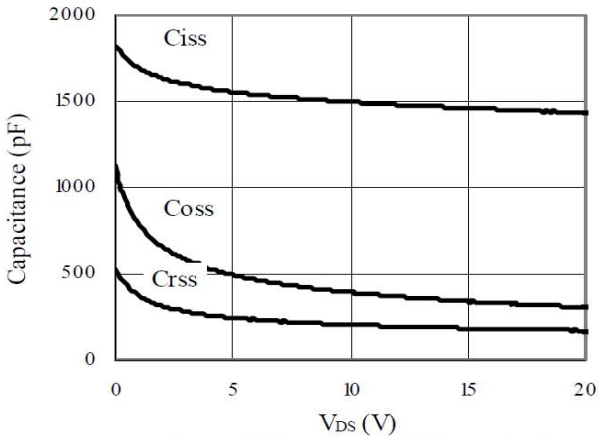


Figure 8. Capacitance Characteristics

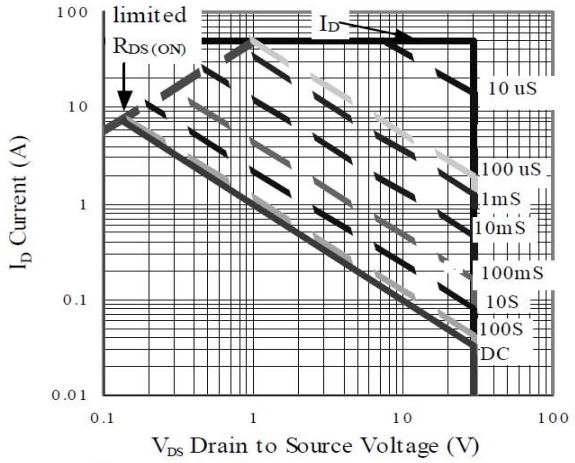


Figure 9. Maximum Safe Operating Area

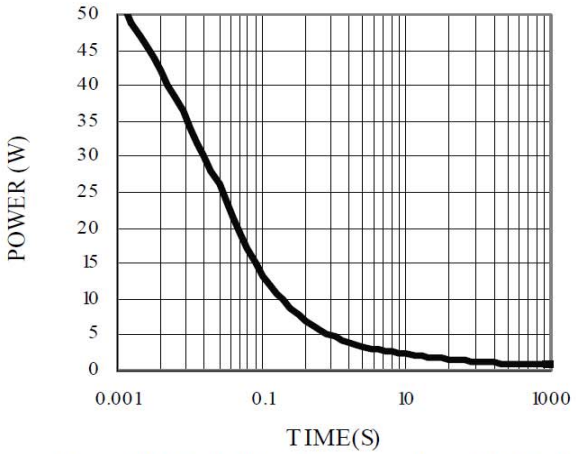


Figure 10. Single Pulse Maximum Power Dissipation

Normalized Thermal Transient Junction to Ambient

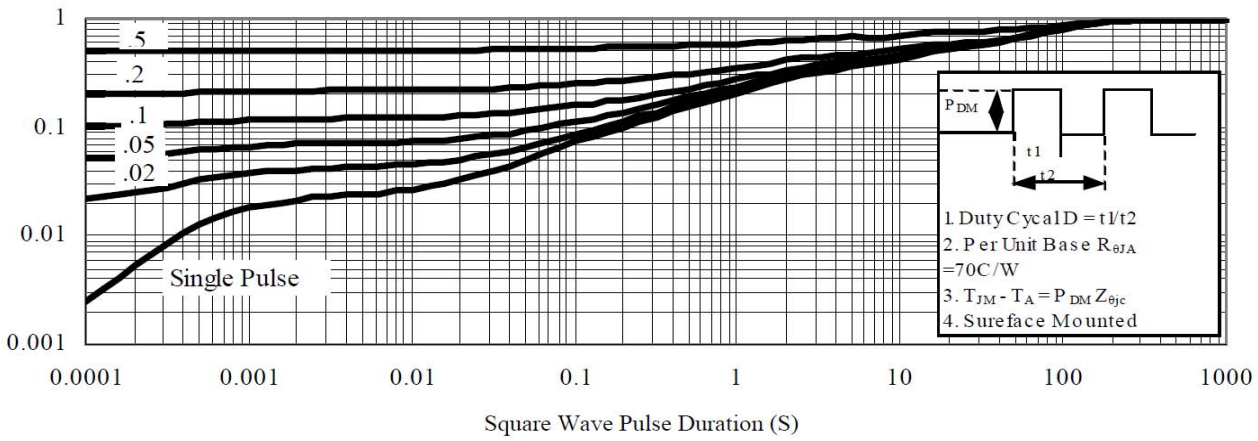


Figure 11. Transient Thermal Response Curve