

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

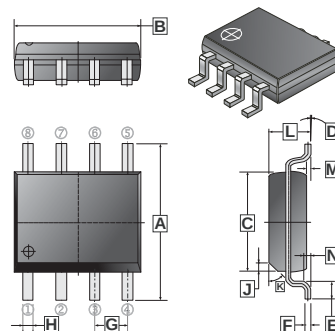
FEATURES

- 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

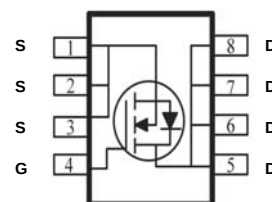
PACKAGE INFORMATION

Package	MPQ	LeaderSize
SOP-8	2.5K	13' inch

SOP-8



REF.	Min.	Max.	REF.	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.			



MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ unless otherwise specified)

PARAMETER	SYMBOL	N-CH	P-CH	Unit
Drain-Source Voltage	V _{DS}	20	-20	V
Gate-Source Voltage	V _{GS}	±8	±8	V
Continuous Drain Current ¹	I _D @ T _A = 25°C	6.6	-5.2	A
	I _D @ T _A = 70°C	5.5	-4.2	A
Pulsed Drain Current ²	I _{DM}	20	-20	A
Continuous Source Current (Diode Conduction) ¹	I _S	1.3	-1.3	A
Total Power Dissipation ¹	P _D @ T _A = 25°C	3.1	3.1	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 _{θJA}	40	°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.

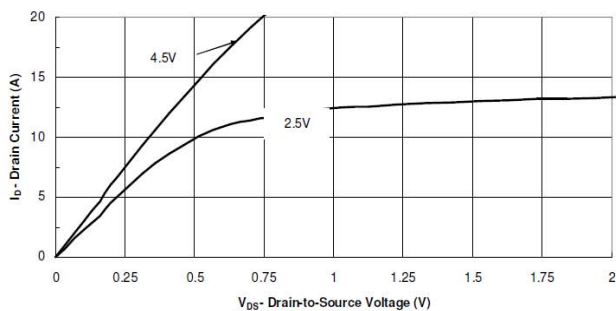
ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Ch	Min.	Typ.	Max.	Unit	Teat Conditions	
Static								
Gate Threshold Voltage	V _{GS(th)}	N	0.4	-	-	V	V _{DS} = V _{GS} , I _D = 250μA	
		P	0	-	-		V _{DS} = V _{GS} , I _D = -250μA	
Gate-Body Leakage	I _{GSS}	N	-	-	±100	nA	V _{DS} = 0V, V _{GS} = 12V	
		P	-	-	±100		V _{DS} = 0V, V _{GS} = -12V	
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} = 4.5V	
		P	-20	-	-		V _{DS} = -5V, V _{GS} = -4.5V	
Drain-Source On-Resistance ¹	R _{DS(ON)}	N	-	-	47	mΩ	V _{GS} = 4.5V, I _D = 6.6A	
			-	-	55		V _{GS} = 2.5V, I _D = 6.2A	
		P	-	-	79		V _{GS} = -4.5V, I _D = -5.2A	
			-	-	110		V _{GS} = -2.5V, I _D = -4.4A	
Forward Transconductance ¹	g _{fs}	N	-	25	-	S	V _{DS} = 15V, I _D = 6.6A	
		P	-	10	-		V _{DS} = -15V, I _D = -5.2A	
Dynamic ²								
Total Gate Charge	Q _g	N	-	6.3	-	nC	N-Channel I _D = 6.6A, V _{DS} = 15V, V _{GS} = 4.5V	
		P	-	10	-			
Gate-Source Charge	Q _{gs}	N	-	0.9	-			P-Channel I _D = -5.2A, V _{DS} = -15V, V _{GS} = -4.5V
		P	-	2.2	-			
Gate-Drain Charge	Q _{gd}	N	-	1.9	-			
		P	-	1.7	-			
Switching								
Turn-On Delay Time	T _{d(on)}	N	-	7.4	-	nS	N-Channel V _{DD} = 15V, V _{GS} = 4.5V I _D = 1A, R _{GEN} = 6Ω	
		P	-	7.6	-			
Rise Time	T _r	N	-	4	-			P-Channel V _{DD} = -15V, V _{GS} = -4.5V I _D = -1A, R _{GEN} = 6Ω
		P	-	6.8	-			
Turn-Off Delay Time	T _{d(off)}	N	-	22.2	-			
		P	-	33.6	-			
Fall Time	T _f	N	-	3.6	-			
		P	-	23.2	-			

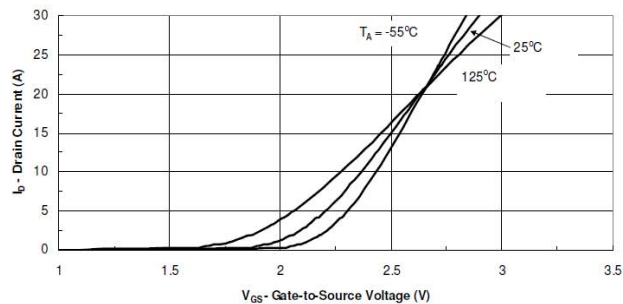
Notes:

- Pulse test : $PW \leq 300\mu\text{s}$ duty cycle $\leq 2\%$.
- Guaranteed by design, not subject to production testing.

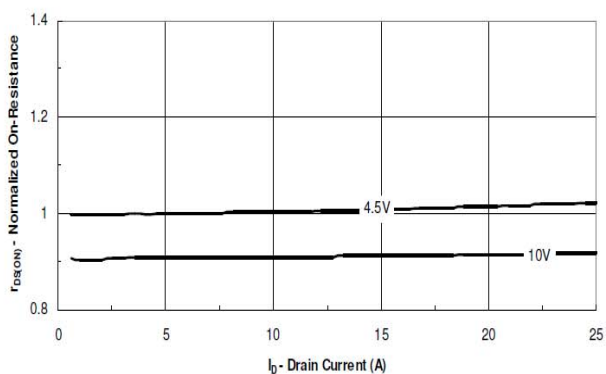
CHARACTERISTIC CURVES (N-Channel)



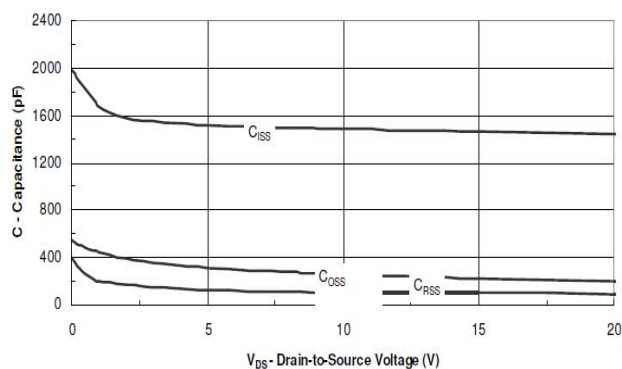
Output Characteristics



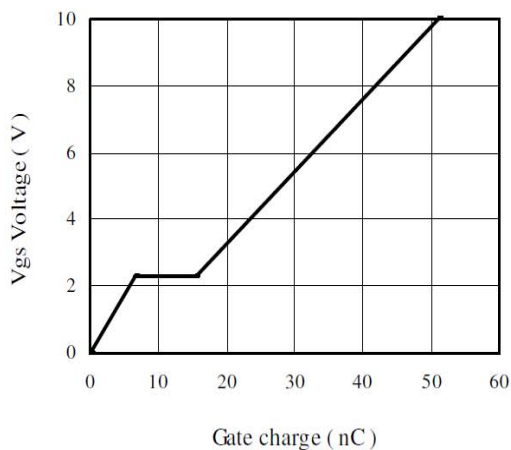
Transfer Characteristics



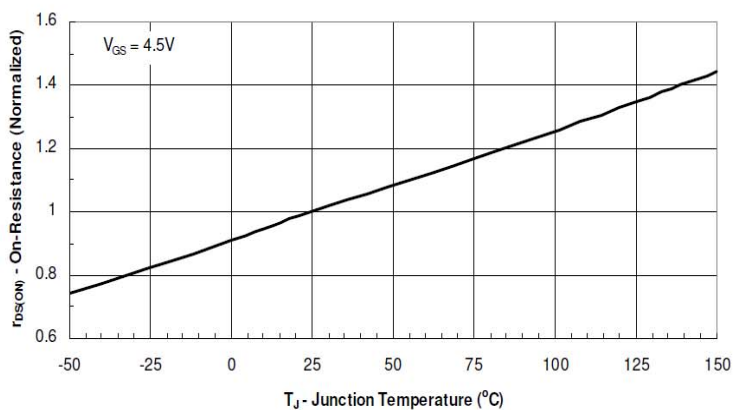
On-Resistance vs. Drain Current



Capacitance

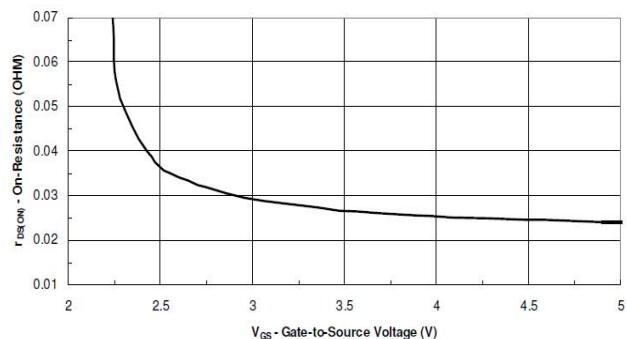
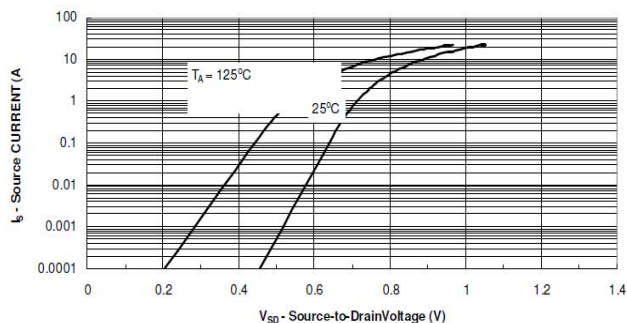


Gate Charge

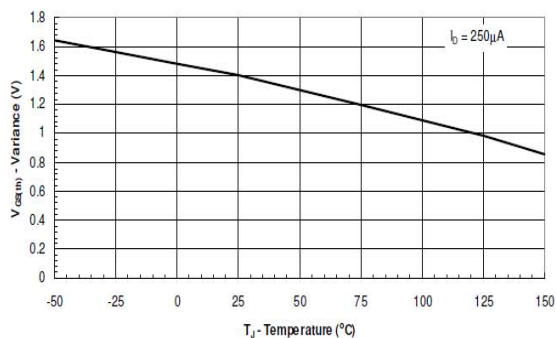


On-Resistance vs. Junction Temperature

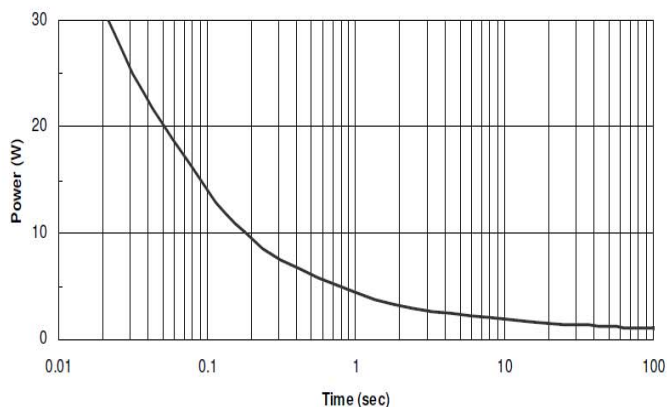
CHARACTERISTIC CURVES



Source-Drain Diode Forward Voltage

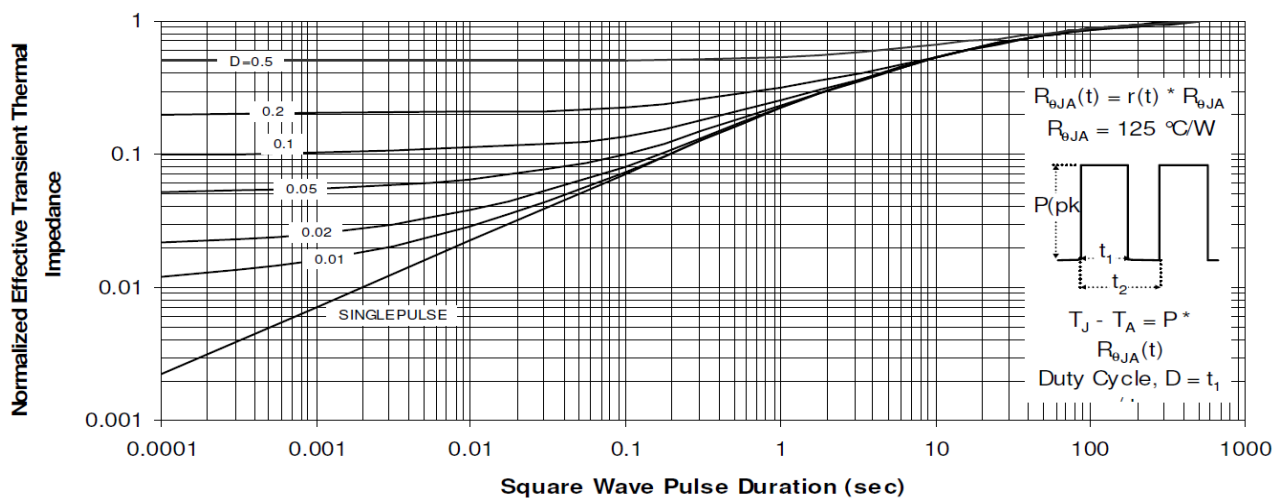


On-Resistance vs. Gate-to Source Voltage



Threshold Voltage

Single Pulse Power



Normalized Thermal Transient Impedance, Junction-to-Ambient

CHARACTERISTIC CURVES (P-Channel)

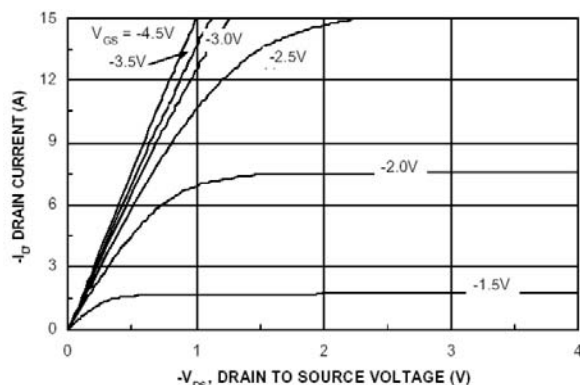


Figure 1. On-Region Characteristics

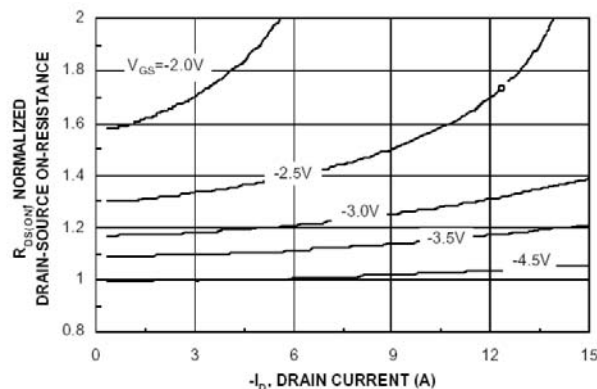


Figure 2. On-Resistance Variation with Drain Current and Gate Voltage

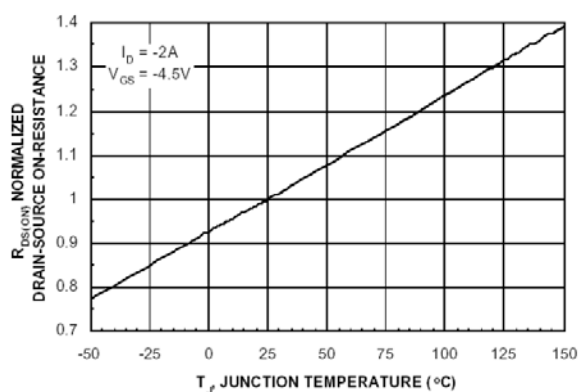


Figure 3. On-Resistance Variation with Temperature

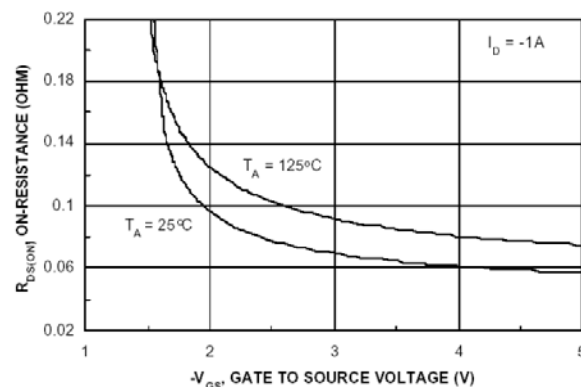


Figure 4. On-Resistance Variation with Gate to Source Voltage

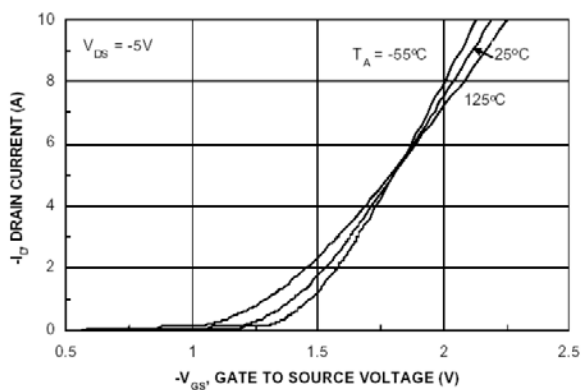


Figure 5. Transfer Characteristics

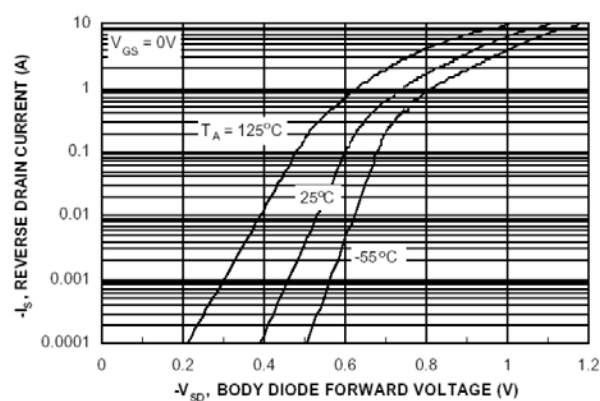


Figure 6. Body Diode Forward Voltage Variation with Source Current and Temperature

CHARACTERISTIC CURVES

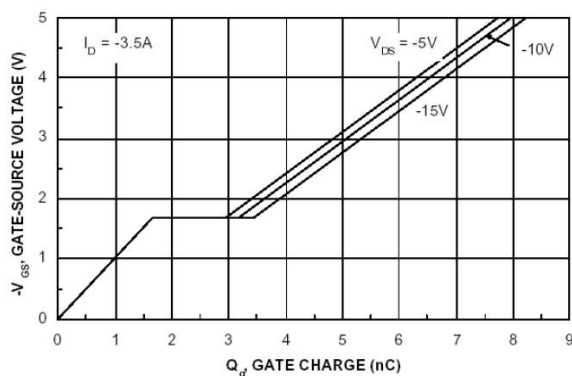


Figure 7. Gate Charge Characteristic

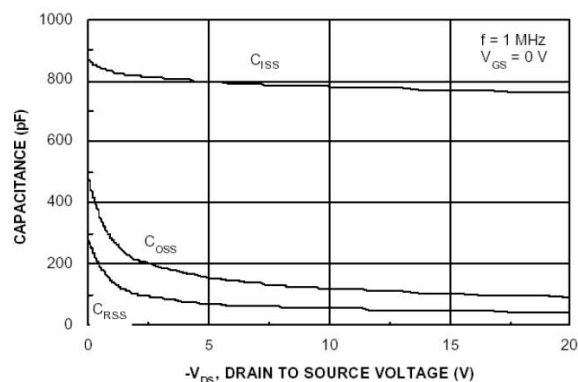


Figure 8. Capacitance Characteristic

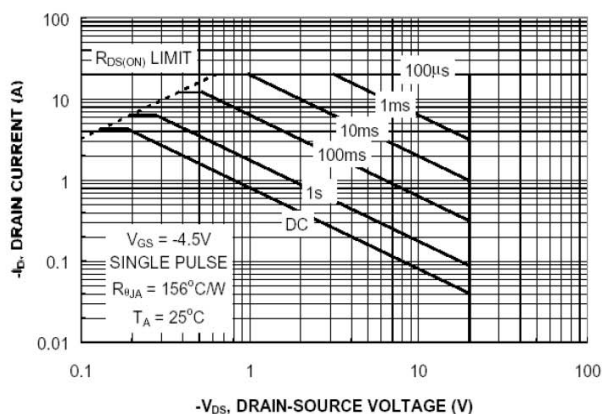


Figure 9. Maximum Safe Operating Area

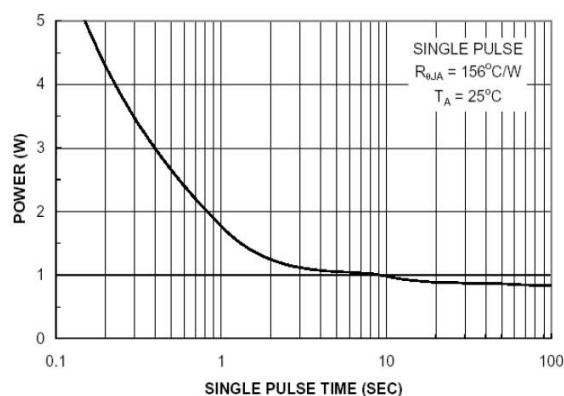


Figure 10. Single Pulse Maximum Power Dissipation

Normalized Thermal Transient Junction to Ambient

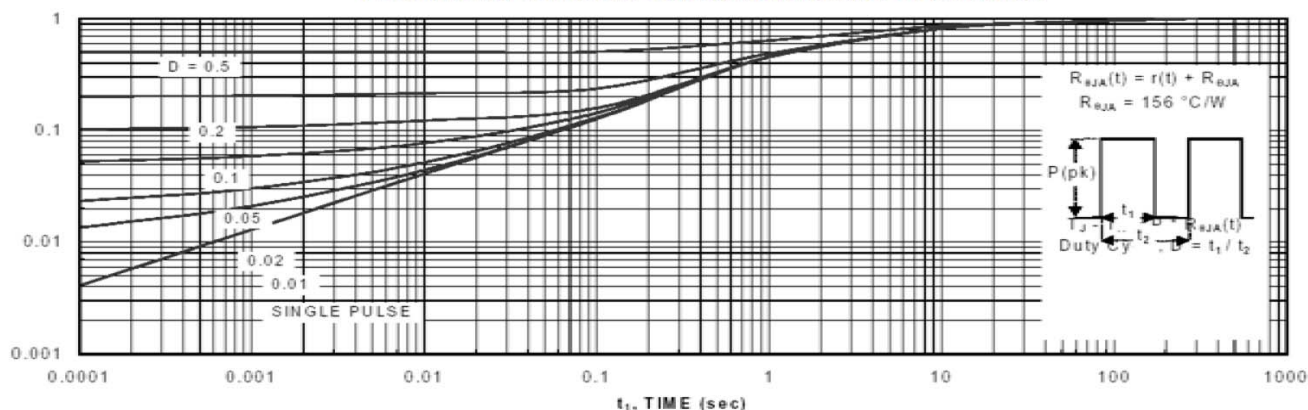


Figure 11. Transient Thermal Response Curve.