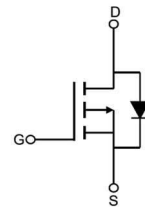


# AP4407C

## P-Channel Enhancement Mosfet

### Feature

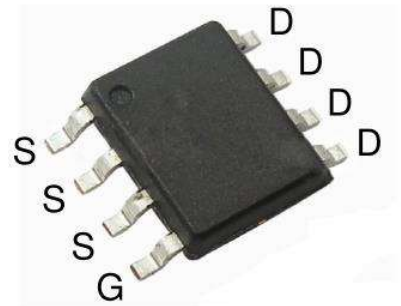
- -30V,-12A  
 $R_{DS(ON)} < 14m\Omega @ V_{GS} = -10V$  TYP:10.5 m $\Omega$   
 $R_{DS(ON)} < 19m\Omega @ V_{GS} = -4.5V$  TYP:15 m $\Omega$
- Trench DMOS Power MOSFET
- Fast Switching
- Exceptional on-resistance and maximum DC current capability



Schematic diagram

### Application

- DC/DC Converter
- Load Switch for Portable Devices
- Battery Switch



SOP-8

### Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity (PCS)
4407C	AP4407C	SOP-8	13 inch	-	4000

### ABSOLUTE MAXIMUM RATINGS ( $T_a=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	-30	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current ( $T_a=25^\circ\text{C}$ )	$I_D$	-12	A
Continuous Drain Current ( $T_a=100^\circ\text{C}$ )	$I_D$	-8.4	A
Pulsed Drain Current <sup>(1)</sup>	$I_{DM}$	-50	A
Singel Pulsed Avalanche Energy <sup>(4)</sup>	$E_{AS}$	100	mJ
Power Dissipation	$P_D$	3.7	W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	42.8	$^\circ\text{C}/\text{W}$
Junction Temperature	$T_J$	150	$^\circ\text{C}$
Storage Temperature	$T_{STG}$	-55~ +150	$^\circ\text{C}$

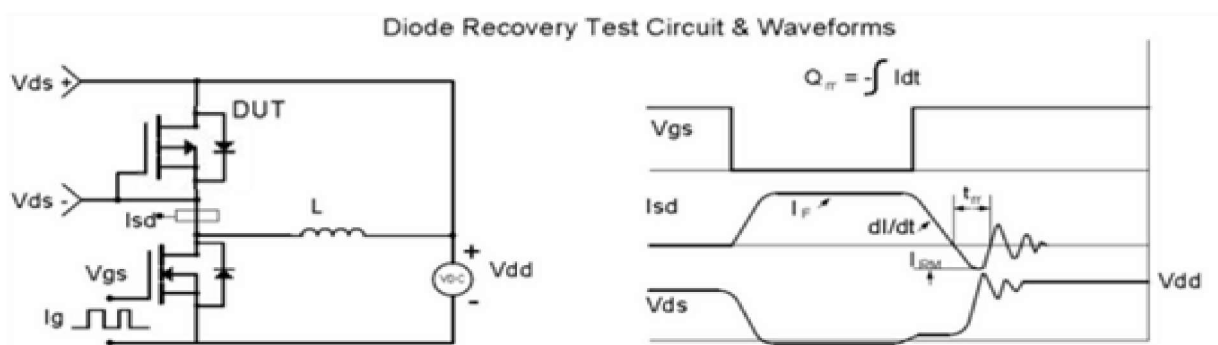
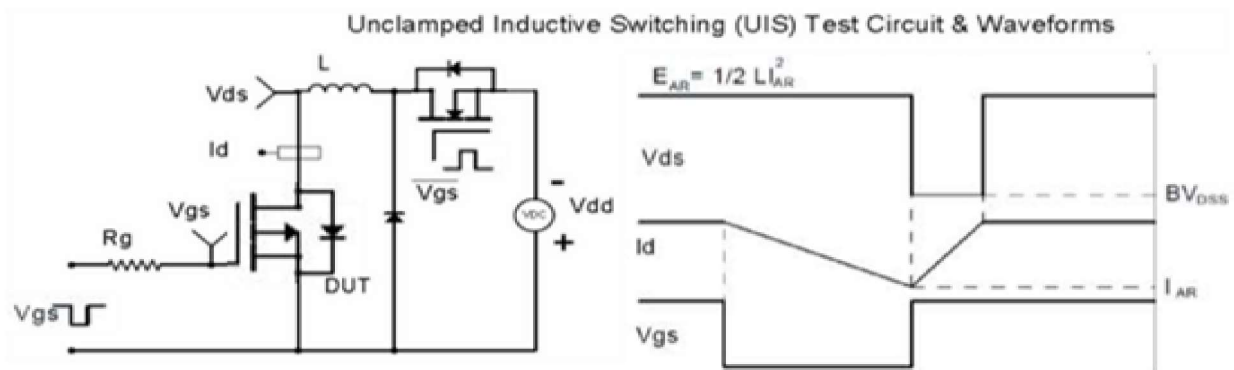
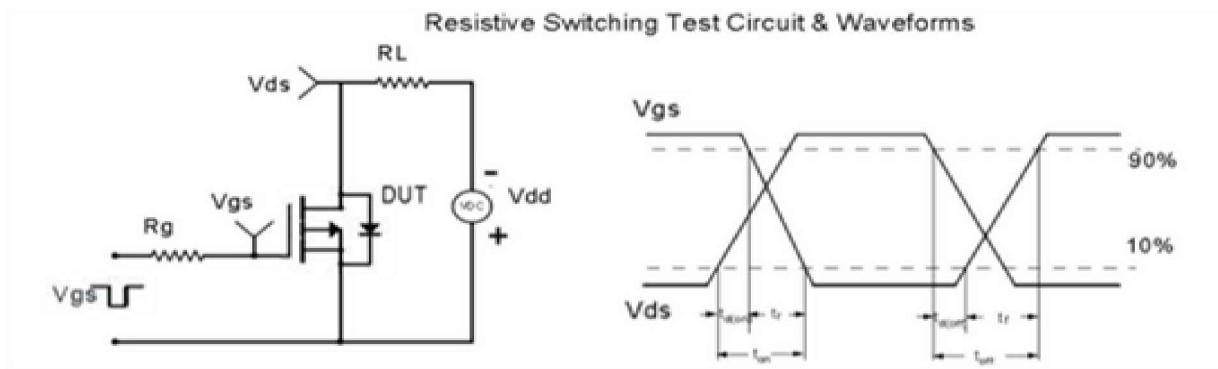
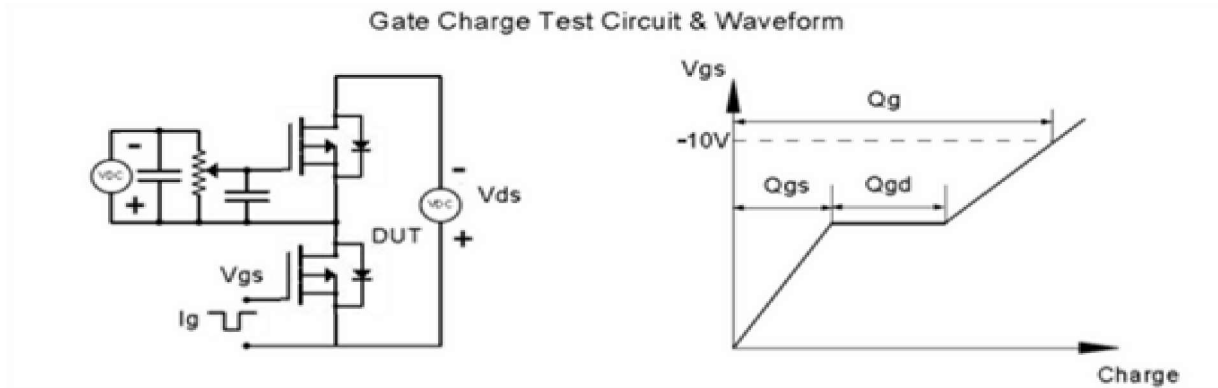
MOSFET ELECTRICAL CHARACTERISTICS( $T_a=25^{\circ}\text{C}$  unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
<b>Static Characteristics</b>						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = -250\mu A$	-30	-	-	V
Zero gate voltage drain current	$I_{DSS}$	$V_{DS} = -30V, V_{GS} = 0V$	-	-	-1	$\mu A$
Gate-body leakage current	$I_{GSS}$	$V_{GS} = \pm 20V, V_{DS} = 0V$	-	-	$\pm 100$	nA
Gate threshold voltage <sup>(2)</sup>	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	-1	-1.5	-2.5	V
Drain-source on-resistance <sup>(2)</sup>	$R_{DS(on)}$	$V_{GS} = -10V, I_D = -10A$	-	10.5	14	m $\Omega$
		$V_{GS} = -4.5V, I_D = -5A$	-	15	19	
<b>Dynamic characteristics</b>						
Input Capacitance	$C_{iss}$	$V_{DS} = -15V, V_{GS} = 0V, f = 1MHz$	-	2863	-	pF
Output Capacitance	$C_{oss}$		-	349	-	
Reverse Transfer Capacitance	$C_{rss}$		-	237	-	
<b>Switching characteristics</b>						
Turn-on delay time	$t_{d(on)}$	$V_{DD} = -15V, I_D = -12A$ $V_{GS} = -10V, R_G = 2.5\Omega$	-	11.5	-	ns
Turn-on rise time	$t_r$		-	38.5	-	
Turn-off delay time	$t_{d(off)}$		-	89	-	
Turn-off fall time	$t_f$		-	19	-	
Total Gate Charge	$Q_g$	$V_{DS} = -15V, I_D = -10A,$ $V_{GS} = -10V$	-	54.8	-	nC
Gate-Source Charge	$Q_{gs}$		-	7.5	-	
Gate-Drain Charge	$Q_{gd}$		-	12.5	-	
<b>Source-Drain Diode characteristics</b>						
Diode Forward voltage <sup>(2)</sup>	$V_{DS}$	$V_{GS} = 0V, I_S = -10A$	-	-	-1.2	V
Diode Forward current <sup>(3)</sup>	$I_S$		-	-	-12	A

**Notes:**

1. Repetitive Rating: pulse width limited by maximum junction temperature
2. Pulse Test: pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$
3. Surface Mounted on FR4 Board,  $t \leq 10$  sec
4.  $L = 0.5mH, V_{DD} = -15V, R_G = 25\Omega, T_J = 25^{\circ}\text{C}$

**Test Circuit & Waveform**



**Typical Performance Characteristics**

Fig.1 Power Dissipation Derating Curve

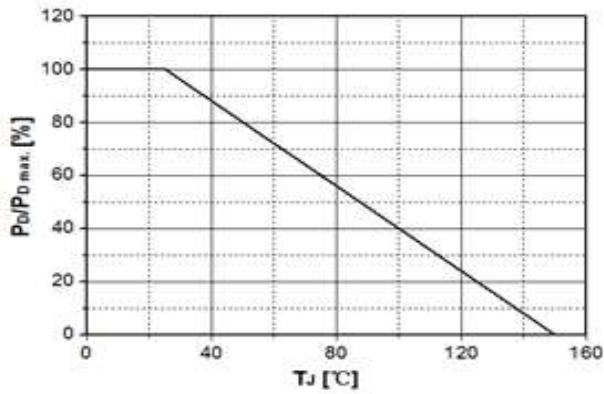


Fig.2 Avalanche Energy Derating Curve vs. Junction Temperature

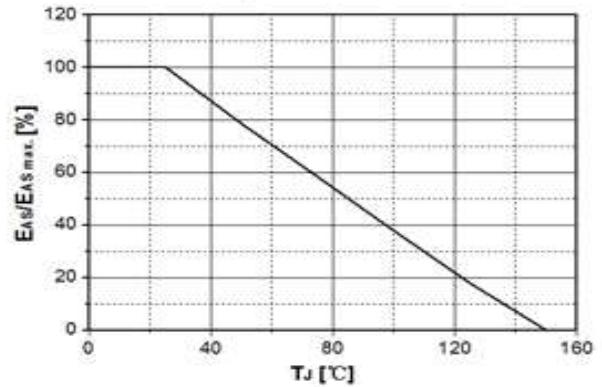


Fig.3 Typical Output Characteristics

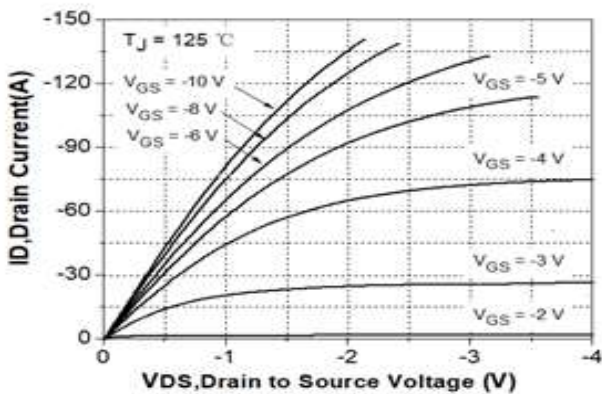


Fig. 4 Transconductance vs. Drain Current

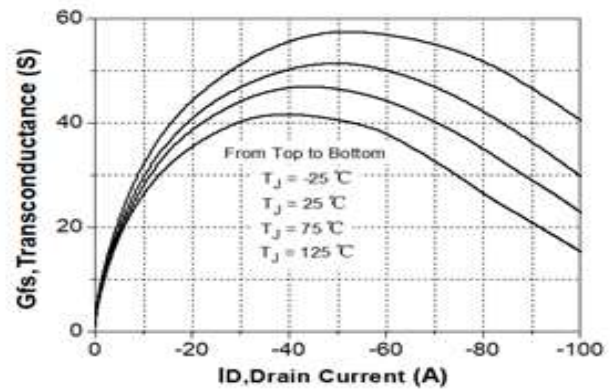


Fig.5 Typical Transfer Characteristics

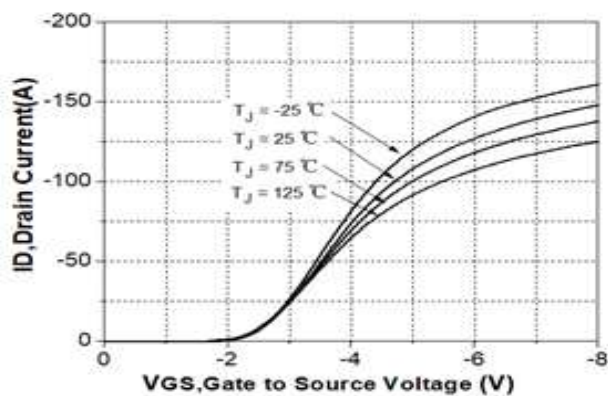


Fig. 6 State Resistance vs. Drain Current @-25°C

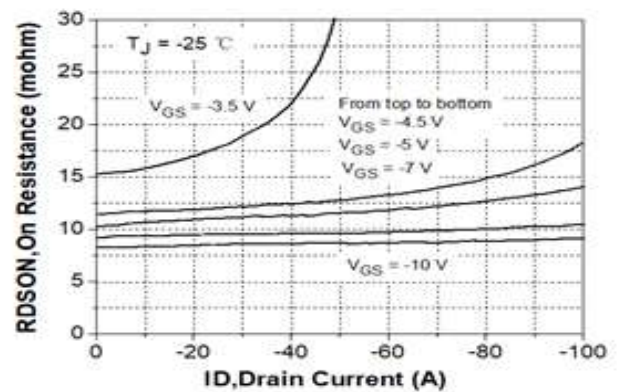


Fig.7 State Resistance vs. Drain Current @25°C

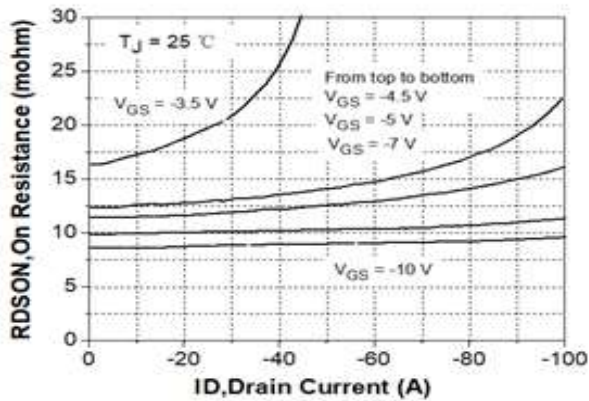


Fig. 8 State Resistance vs. Drain Current @125°C

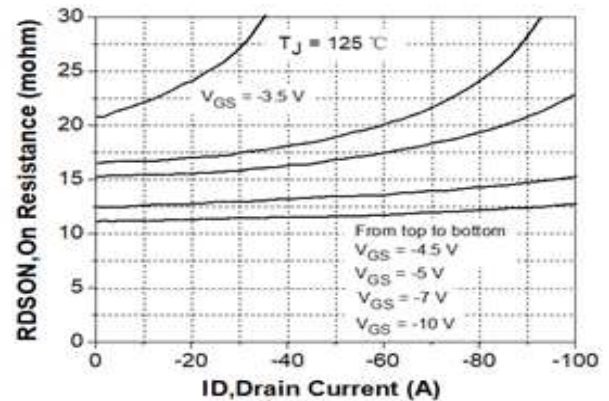


Fig.9 Typical Capacitance vs. Drain Source Voltage

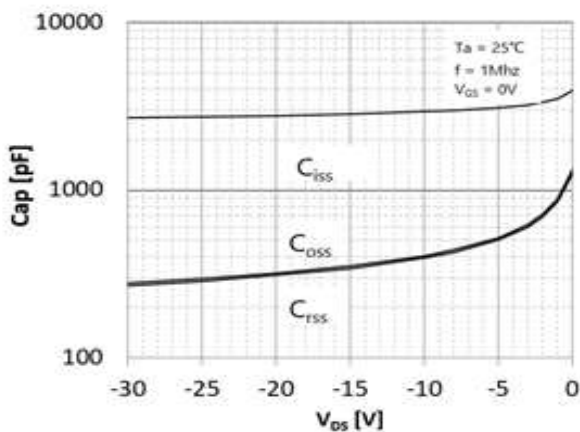


Fig.10 Dynamic Input Characteristics

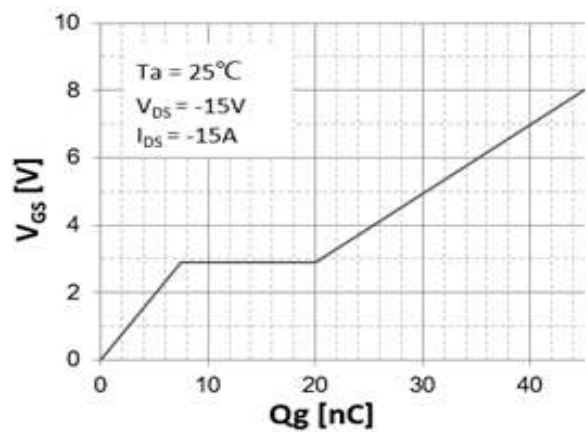


Fig.11 Breakdown Voltage vs. Junction Temperature

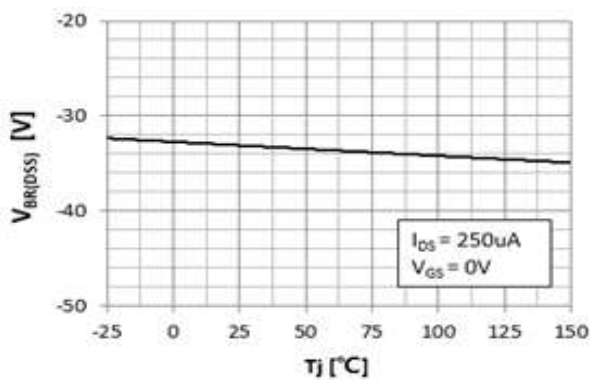


Fig. 12 Gate Threshold Voltage vs. Junction Temperature

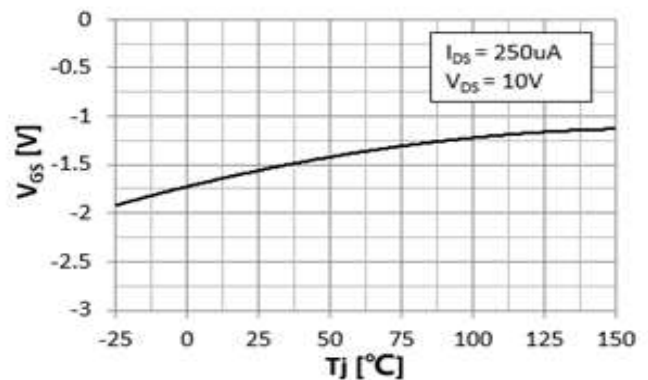


Fig.13 On-Resistance Variation vs. Junction Temperature

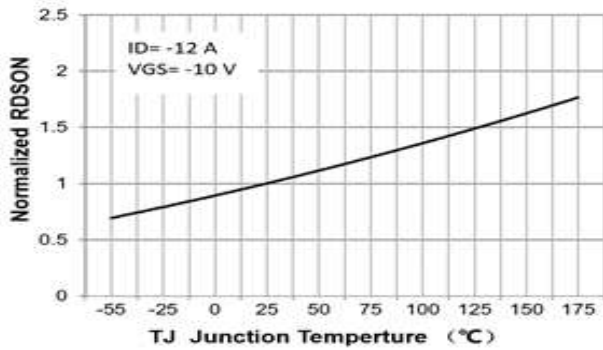


Fig.14 Maximum Drain Current vs. Case Temperature

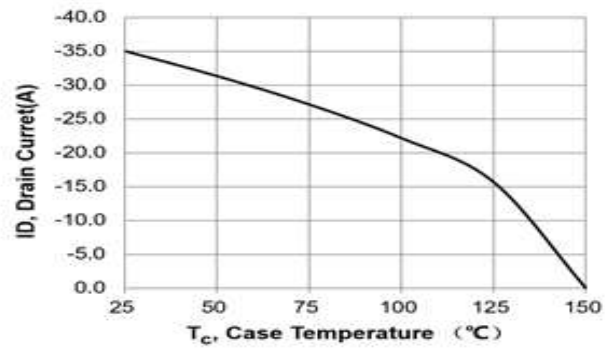


Fig.15 Body Diode Forward Voltage Vs Reverse Drain Current

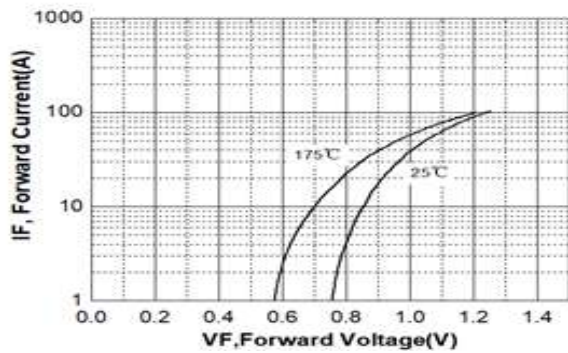


Fig.16 Safe Operating Area

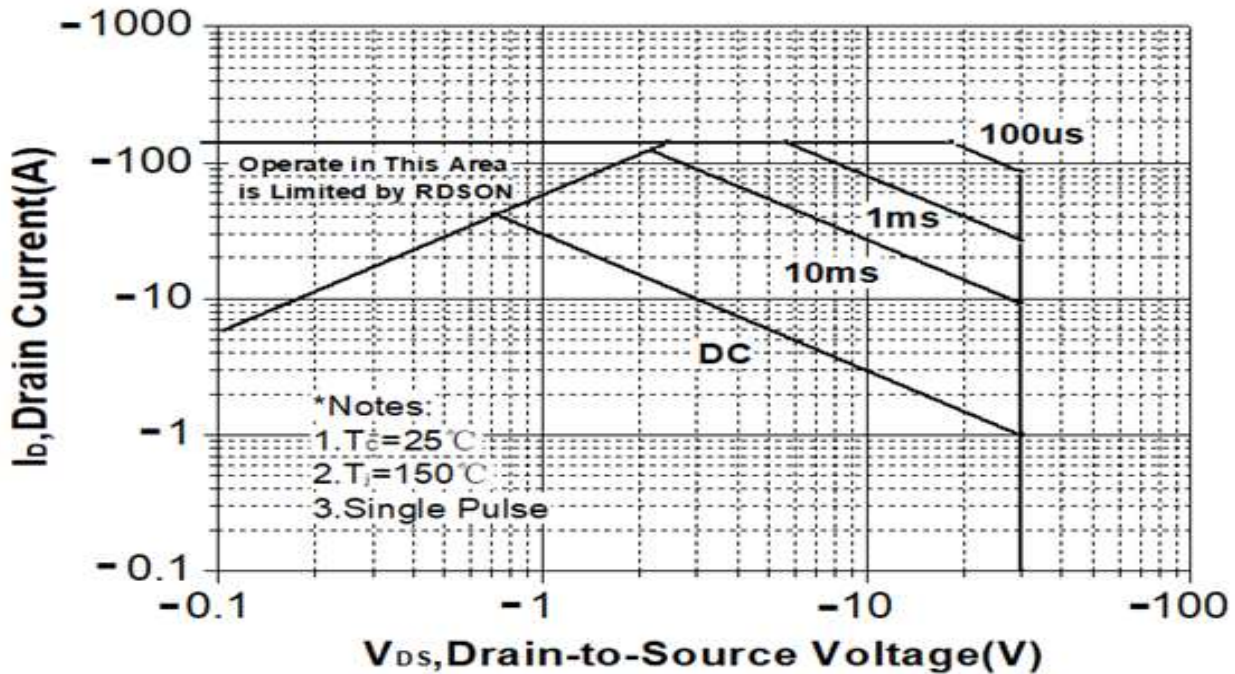
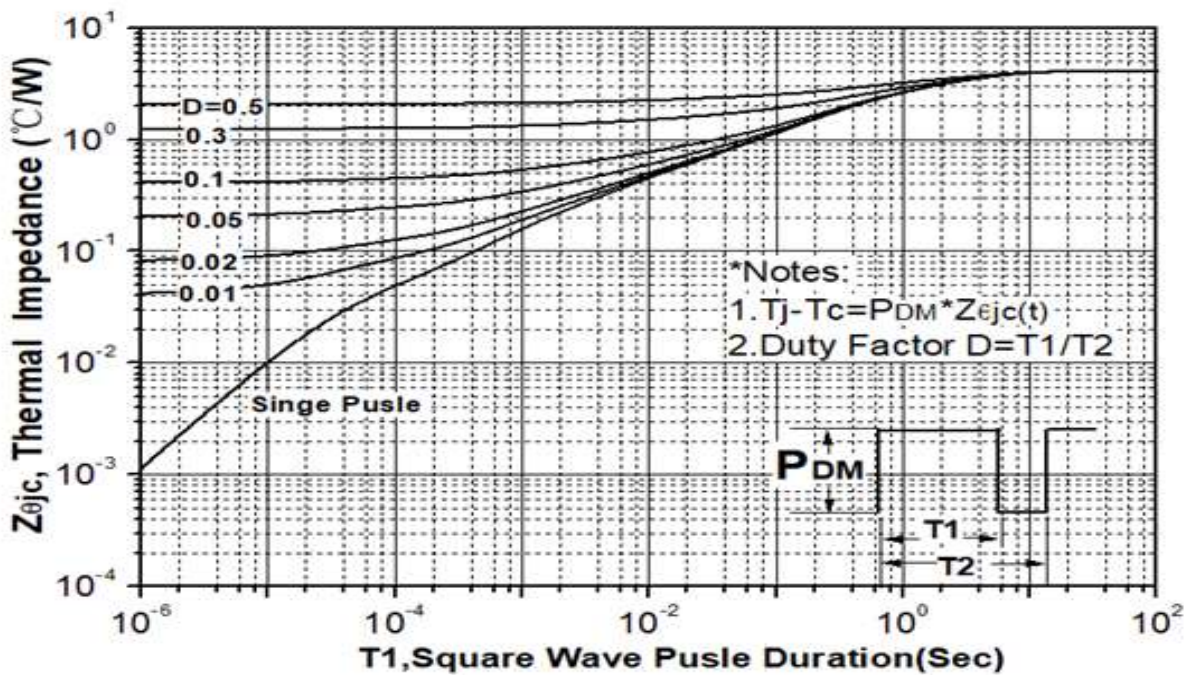
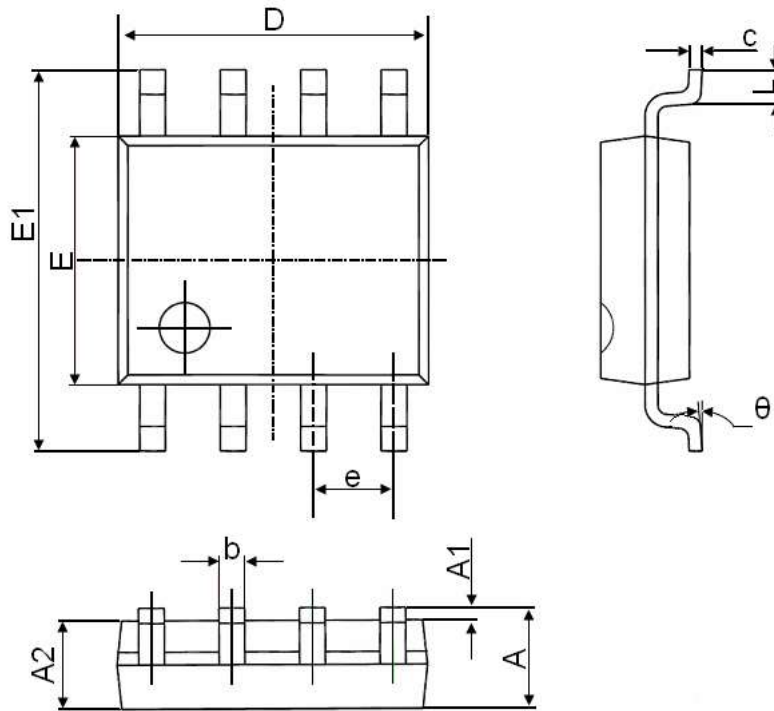


Fig. 17 Transient Thermal Response Curve



**SOP-8 Package Information**



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270(BSC)		0.050(BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°



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