SMPR70N1K4KK3H

N-Channel Enhancement Mode Field Effect Transistor

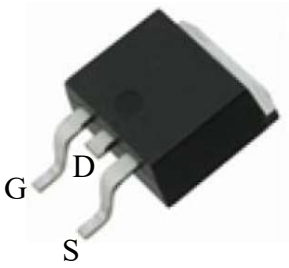
FEATURES

· ESD protected

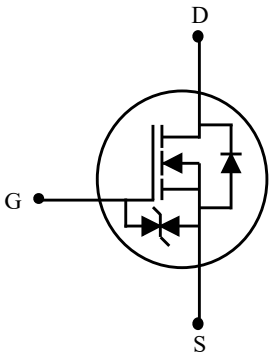
· Suffix "H" indicates Halogen-free parts, ex. SMPR70N1K4KK3H

PIN CONFIGURATION

TO-252



TOP VIEW



D	Drain
G	Gate
S	Source

Maximum Ratings(T_A=25 ℃ unless otherwise noted)

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	700	V
Gate-Source Voltage		V_{GS}	±20	V
Drain Current	T_C=25℃ T_C=100℃	I_D	2.7 1.7	A
Pulsed Drain Current (Note 1)	T_C=25℃	I_{DM}	6	A
Avalanche Current		I_{AS}	0.7	A
Avalanche Energy (Note 2)		E_{AS}	19.3	mJ
Power Dissipation	T_C=25℃	P_D	34.4	W
Thermal Resistance from Juntion to Ambient (Note 3)		$R_{\theta JA}$	36	℃/W
Thermal Resistance from Juntion to Case		$R_{\theta JC}$	3.6	℃/W
Operating and Storage Temperature Range		T_J,T_{stg}	- 55 to + 150	℃

Note :

1. Pulse Test: Pulse Width≤100μs, Duty Cycle≤2%,Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$=150°C.

2. Limited by $T_{J(MAX)}$, starting T_J=25°C, L=79mH, R_g=25Ω , I_{AS}=0.7A, V_{GS}=10V.

2. Device mounted on FR-4 substrate PC board, 2oz copper, with 1-inch square copper plate in still air.

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Electrical Characteristics(T_A=25 ℃ unless otherwise specified)

Parameter	Conditions	Symbol	Min.	Typ.	Max.	Unit
Static						
Drain Source Breakdown Voltage	I_D=250μA	$V_{(BR)DSS}$	700	-	-	V
Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250μA	$V_{GS(th)}$	2.5	-	3.5	V
Zero Gate Voltage Drain Current	V_{DS}=560V	I_{DSS}	-	-	1	μA
Gate-Body Leakage Current	V_{GS}=±16V	I_{GSS}	-	-	±1	μA
Drain-Source On-State Resistance	V_{GS}=10V, I_D=1A	$R_{DS(on)}$	-	1.4	1.6	Ω
Forward Transconductance	V_{DS}=5V, I_D=1A	g_{fs}	-	82	-	S
Dynamic						
Gate Resistance	V_{DS}=0V, V_{GS}=0V, f=1MHz	R_g	-	20	-	Ω
Total Gate Charge	V_{DS}=350V, V_{GS}=10V, I_D=1A	Q_g	-	5.8	-	nC
Gate-Source Charge		Q_{gs}	-	1.4	-	
Gate-Drain Charge		Q_{gd}	-	2.0	-	
Input Capacitance	V_{DS}=350V, V_{GS}=0V, f=1MHz	C_{iss}	-	209	-	pF
Output Capacitance		C_{oss}	-	12	-	
Reverse Transfer Capacitance		C_{rss}	-	5	-	
Turn-On Delay Time	V_{GS}=10V, V_{DS}=350V, I_D=1A, R_g=4.7Ω	$t_{d(on)}$	-	9	-	ns
Turn-On Rise Time		t_r	-	11	-	
Turn-Off Delay Time		$t_{d(off)}$	-	19	-	
Turn-Off Fall Time		t_f	-	86	-	
Drain-Source Body Diode						
Drain-Source Diode Forward Voltage	V_{GS}=0V, I_S=1A	V_{SD}	-	-	1.4	V
Diode Continuous Source Current	-	I_S	-	-	2.7	A
Diode Pulse Current		I_{SM}	-	-	6	A
Reverse Recovery Time	I_S=1A, di/dt=100A/μs	t_{rr}	-	143	-	ns
Reverse Recovery Charge		Q_{rr}	-	498	-	nC

RATINGS AND CHARACTERISTIC CURVES

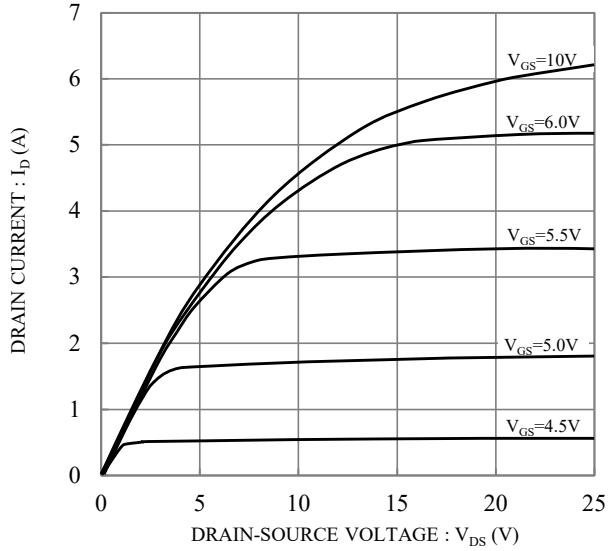

Fig.1 Typical Output Characteristics

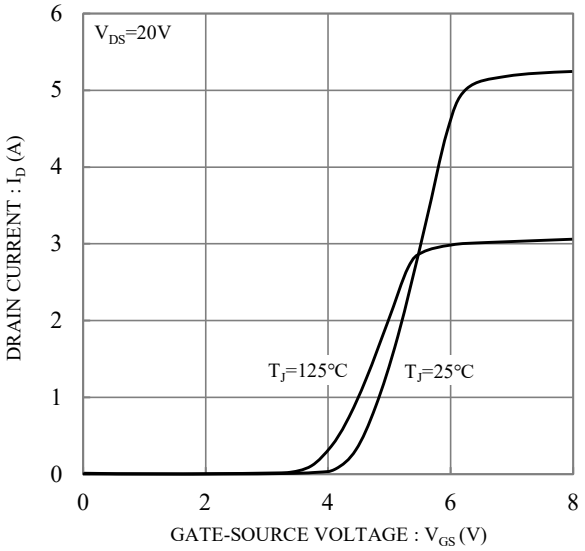

Fig.2 Typical Transfer Characteristics

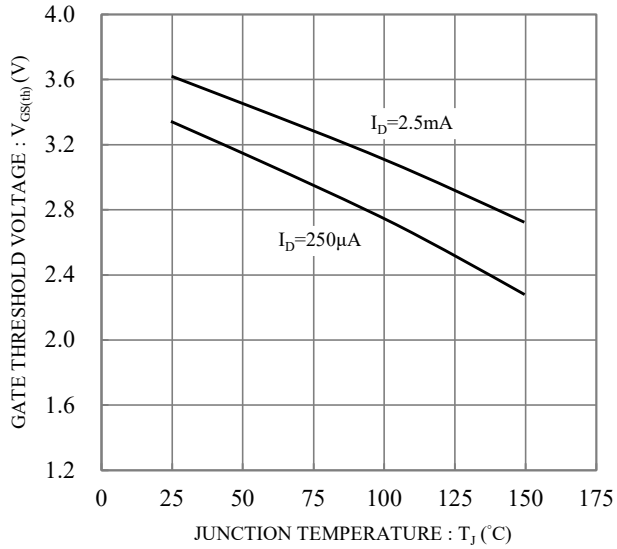

Fig.3 Gate Threshold Voltage vs. Junction Temperature

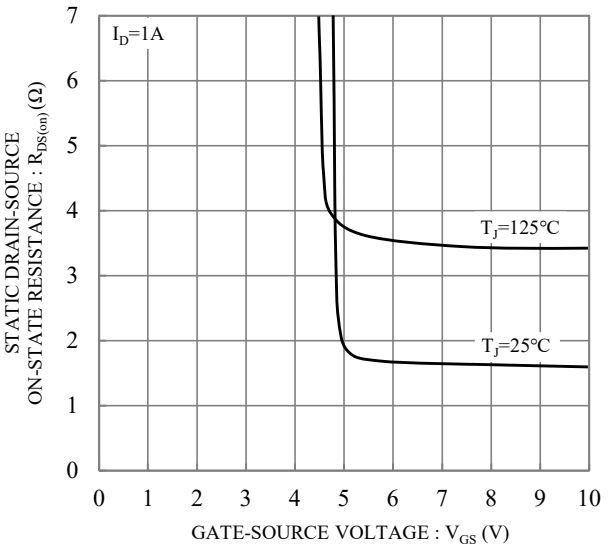

Fig.4 Static Drain-Source On-State Resistance vs. Gate-Source Voltage

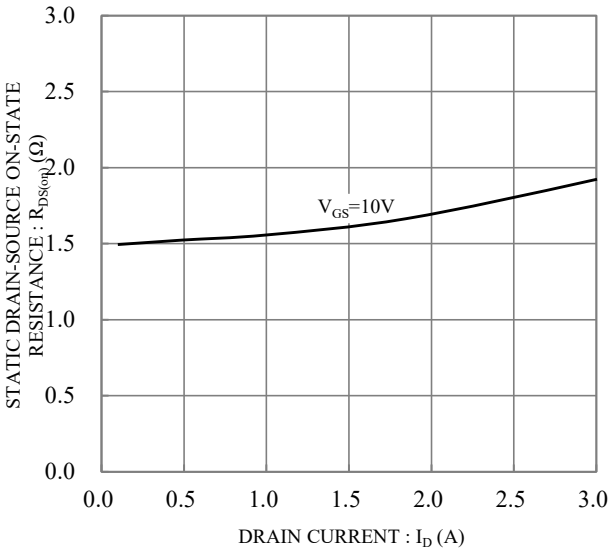

Fig.5 Static Drain-Source On-State Resistance vs. Drain Current

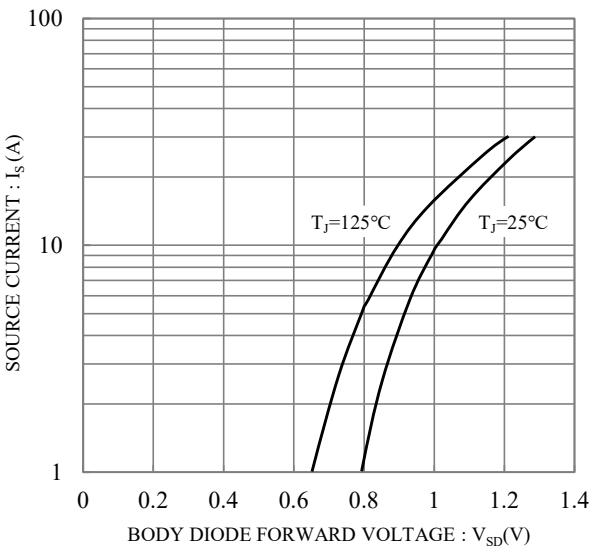

Fig.6 Body Diode Forward Voltage vs. Source Current

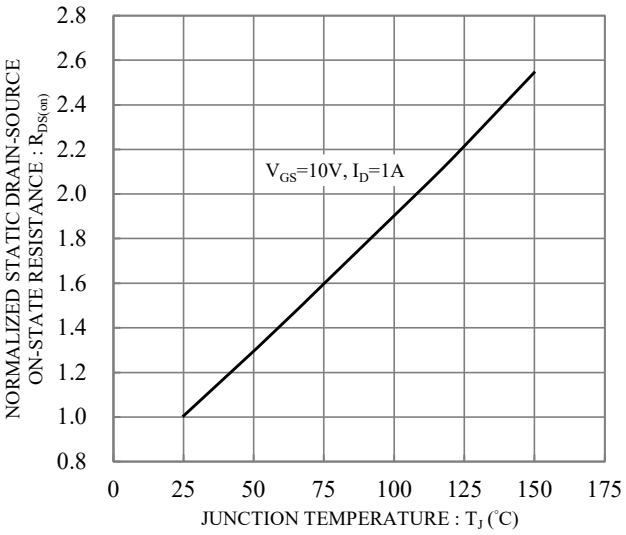

Fig.7 Drain-Source On-State Resistance vs. Junction Tempearture

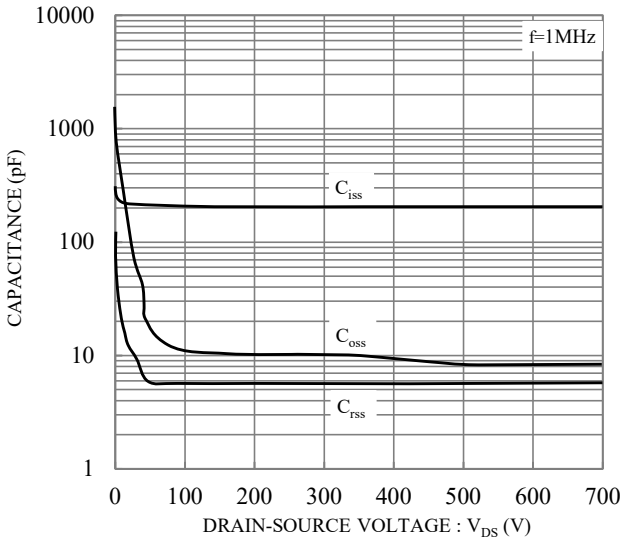

Fig.8 Capacitance vs. Drain-Source Voltage

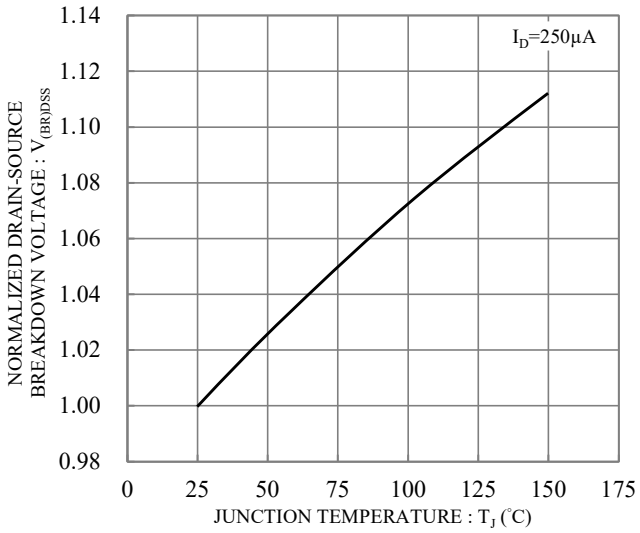

Fig.9 Breakdown Voltage vs. Junction Temperature

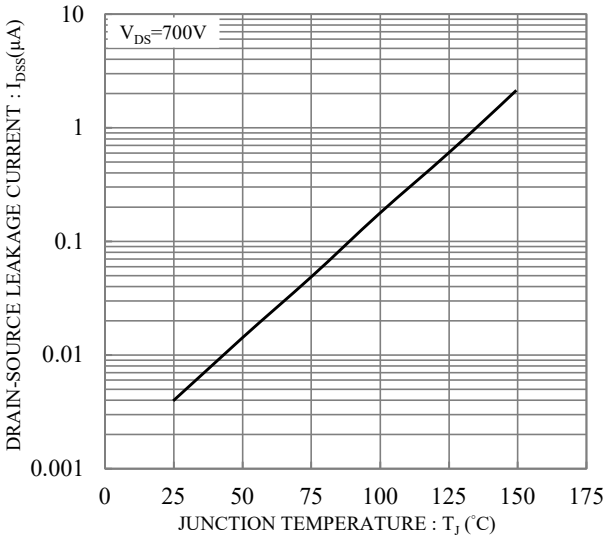

Fig.10 Drain-Source Leakge Current vs. Junction Temperature

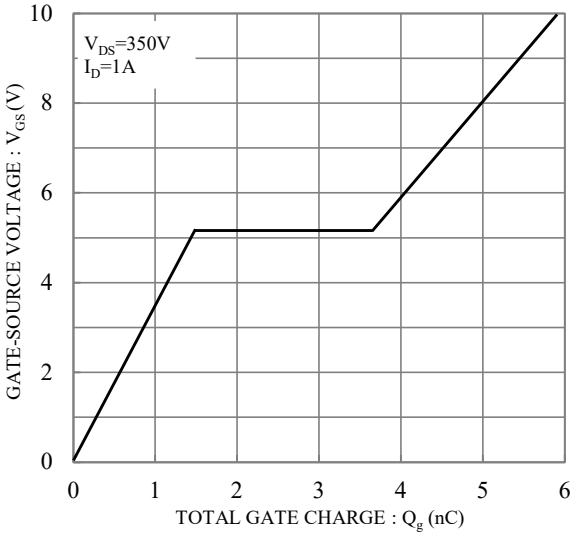

Fig.11 Gate Charge Characteristics

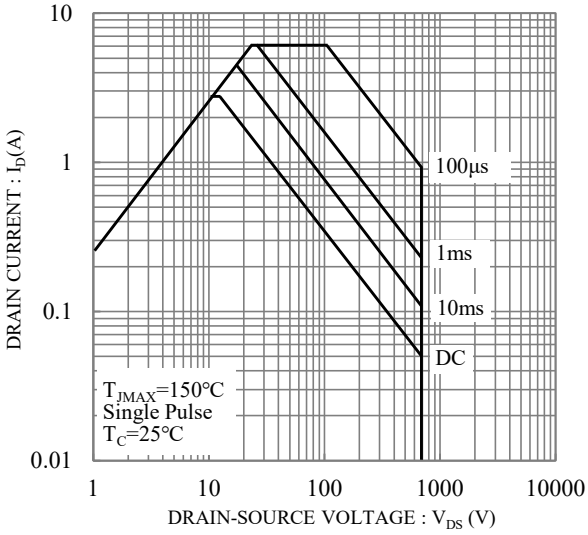

Fig.12 Drain-Source Leakge Current vs. Junction Temperature

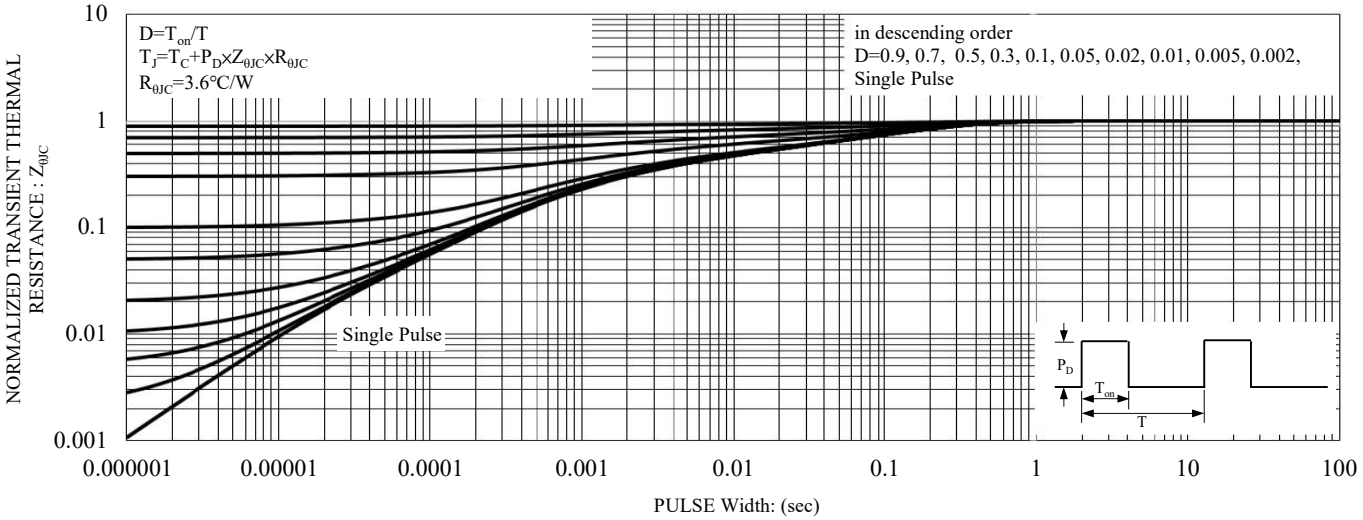

Fig.13 Maximum Transient Thermal Impedance

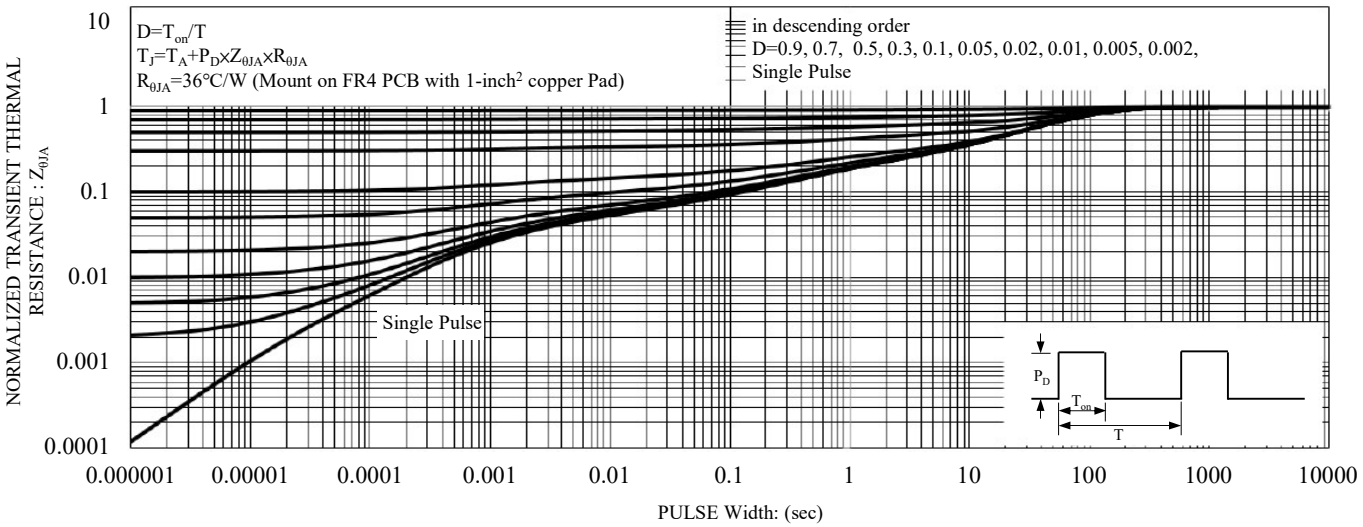

Fig.14 Maximum Transient Thermal Impedance

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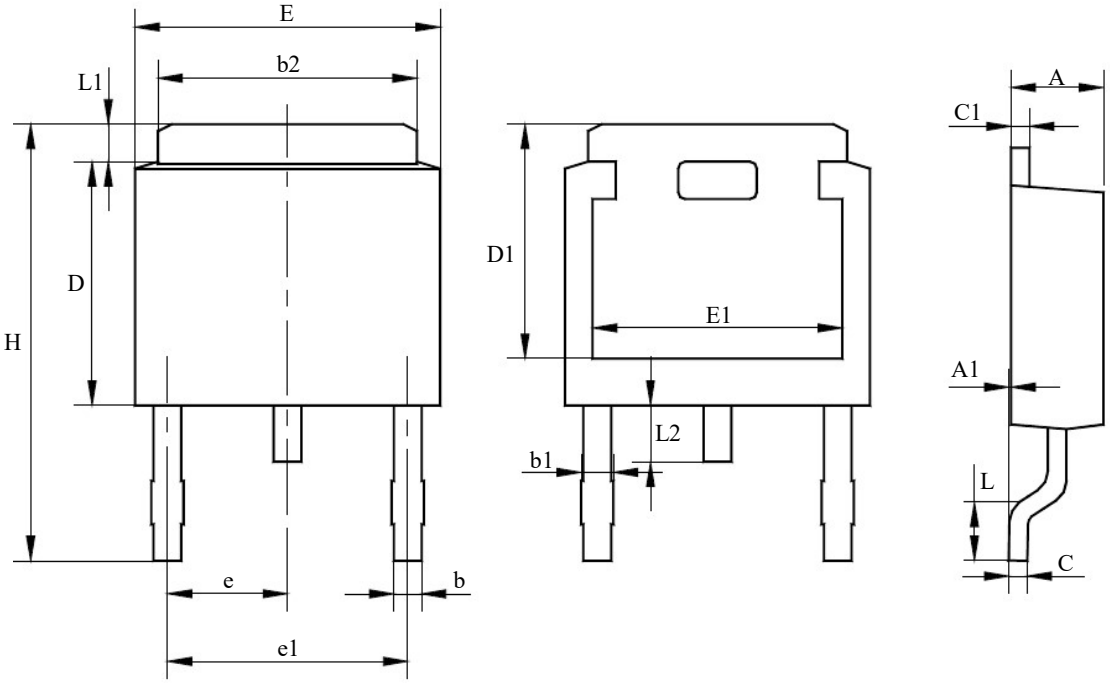
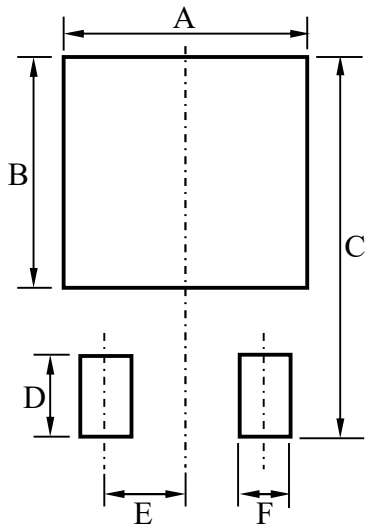
PACKAGE DIMENSION TO-252



Top View Bottom View Side View

Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	2.10	2.50	0.083	0.098
A1	0.00	0.15	0.000	0.006
b	0.50	1.00	0.020	0.039
b1	0.65	1.15	0.026	0.045
b2	4.90	5.50	0.193	0.217
C	0.40	0.65	0.016	0.026
C1	0.40	0.65	0.016	0.026
D	5.60	6.20	0.220	0.244
D1	5.00	5.40	0.197	0.213
E	6.10	6.70	0.240	0.264
E1	4.60	5.00	0.181	0.197
e	Typ. 2.30		Typ. 0.091	
e1	Typ. 4.60		Typ. 0.181	
H	9.00	10.70	0.354	0.421
L	1.40	1.78	0.055	0.070
L1	0.85	1.20	0.033	0.047
L2	0.51	1.10	0.020	0.043

SUGGESTED SOLDER PAD LAYOUT



Unit :mm

PACKAGE	A	B	C	D	E	F
TO-252	7.00	7.00	11.60	2.50	2.30	1.50