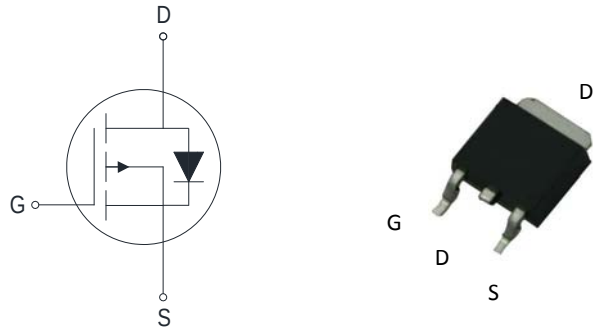
P-Channel Logic Level Enhancement Mode Field Effect Transistor

PRODUCT SUMMARY

V_{DSS}	I_D	$R_{DS(ON)}$ (mΩ)
-60V	-10A	105mΩ



TO-252

Features:

- Low Gate Charge for Fast Switching Application
- Fast Switching
- 100% EAS Guaranteed
- Improved dv/dt Capability
- Green Device Available

Description:

These P-Channel enhancement mode power field effect transistors are using trench DMOS technology. design to provide excellent $R_{DS(ON)}$ with low gate charge.provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode.These devices are well suited for high efficiency fast switching applications.

Absolute Maximum Ratings (T_A = 25°C unless otherwise specifed)

Symbol	Parameter		Ratings	Unit
Common Ratings				
V_{DSS}	Drain-Source Voltage		-60	V
V_{GSS}	Gate-Source Voltage		±20	
T_J	Maximum Junction Temperature		150	°C
T_{STG}	Storage Temperature Range		-55 to150	°C
I_S	Diode Continuous Forward Current	T_C =25°C	-10	A
Mounted on Large Heat Sink				
I_{DM}	300μs Pulse Drain Current Tested (2)	T_C=25°C, V_{GS}=-10V	-40	A
I_D	Continuous Drain Current (1)	T_C=25°C, V_{GS}=-10V	-10	A
		T_C=100°C V_{GS}=-10V	-6.3	A
P_D	Maximum Power Dissipation	T_C=25°C	32	W

Thermal Characteristics

Symbol	Parameter	Ratings	Unit
R_{thJC}	Thermal resistance junction-case max (1)	3.84	°C/W
R_{thJA}	Thermal resistance junction-ambient max (1)	62	°C/W

Electrical Characteristics (TA=25°C Unless Otherwise Noted)

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
On/off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_{DS}=-250uA	-60	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}= -60V, V_{GS}=0V T_J=25°C	--	--	-1	uA
		V_{DS}=-48V,V_{GS}=0V T_J=125°C	--	--	-10	
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_{DS}=-250uA	-1.0	-1.6	-2.5	V
I_{GSS}	Gate Leakage Current	V_{GS}=±20V, V_{DS}=0V	--	--	±100	nA
$R_{DS(ON)}$	Drain-SourceOn-stateResistance(2)	V_{GS}= -10V, I_{DS}=-6A	--	87	105	mΩ
		V_{GS}= -4.5V, I_{DS}=-3A	--	120	145	
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}= -30V, Frequency=1.0MHz	--	785	1300	pF
C_{oss}	Output Capacitance		--	175	300	
C_{rss}	Reverse Transfer Capacitance		--	112	220	
Switching Characteristics						
$t_{d(ON)}$	Turn-on Delay Time(1)	V_{DD}=-30V, I_D= -1A, V_{GS}= -10V, R_{GEN}=6Ω R_L=0.94Ω	--	8	16	ns
t_r	Turn-on Rise Time(1)		--	15.4	30	
$t_{d(OFF)}$	Turn-off Delay Time(1)		--	42.8	80	
t_f	Turn-off Fall Time(1)		--	8.4	16	
Q_g	Total Gate Charge(1)	V_{DS}=-30V, V_{GS}= -10V, I_{DS}=-4A	--	10	15	nC
Q_{gs}	Gate-Source Charge(1)		--	1.6	3.2	
Q_{gd}	Gate-Drain Charge(1)		--	3	6	
Avalanche Characteristics						
EAS	Single Pulse Avalanche Energy (3)	V_{DD}=-25V,L=0.1mH ,V_{GS}=-10V,R_g=25Ω, I_{AS}=-18A T_J=25°C	45	--	--	mJ
Diode Characteristics						
V_{SD}	Diode Forward Voltage(2)	I_{SD} =-1A, V_{GS} = 0V ,T_J=25°C	--	--	-1.0	V

NOTES:

1. Surface Mounted on FR4 Board, t ≤ 10 sec.

2.The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%

3.The Min. value is 100% EAS tested guarantee.

Typical Performance Characteristics

Figure 1: Continuous Drain Current vs.Tc

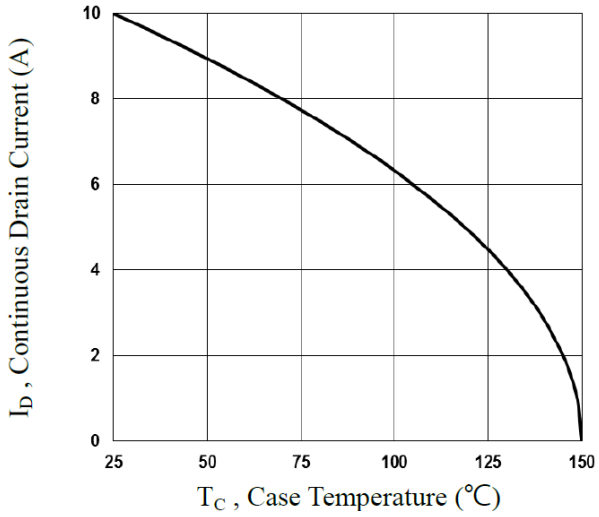


Figure 2: Normalized RDSON vs.TJ

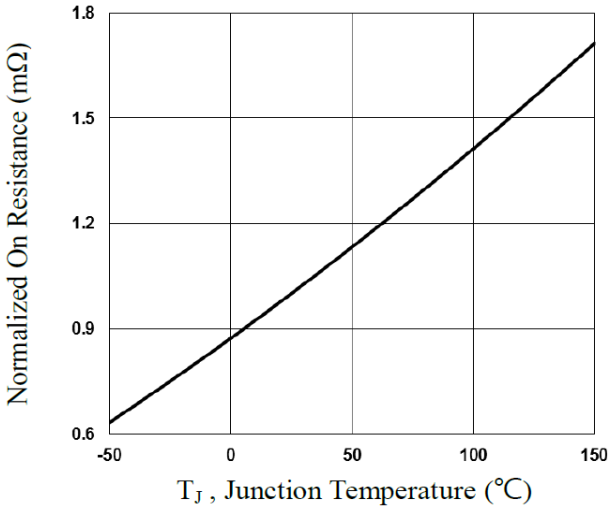


Figure 3: Normalized Vth vs.TJ

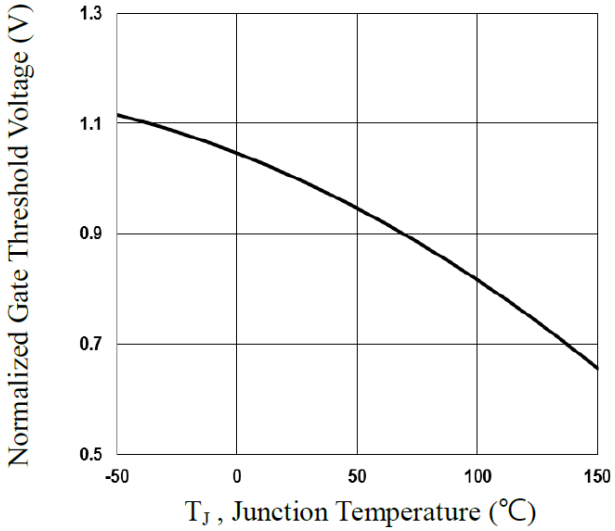


Figure 4: Gate Charge Waveform

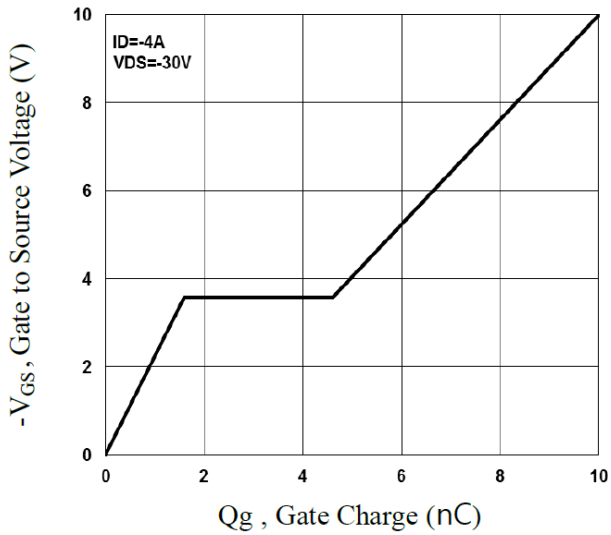


Figure 5: Normalized Transient Response

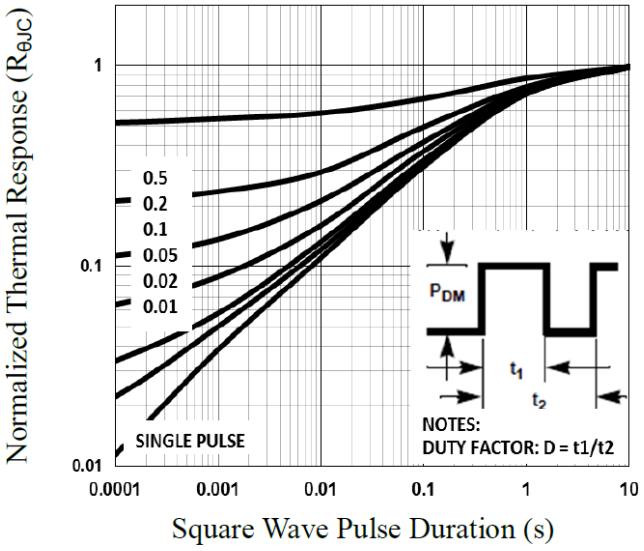


Figure 6: Maximum Safe Operation Area

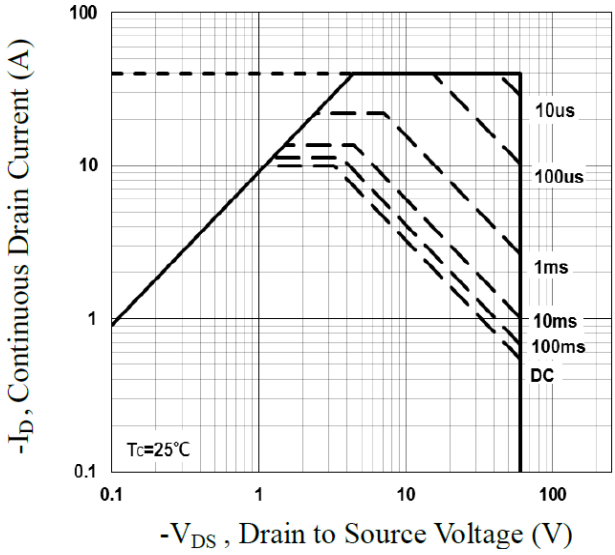


Figure 7: Switching Time Waveform

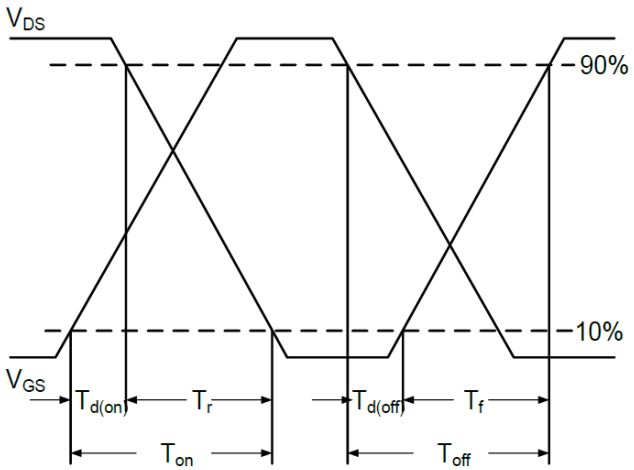
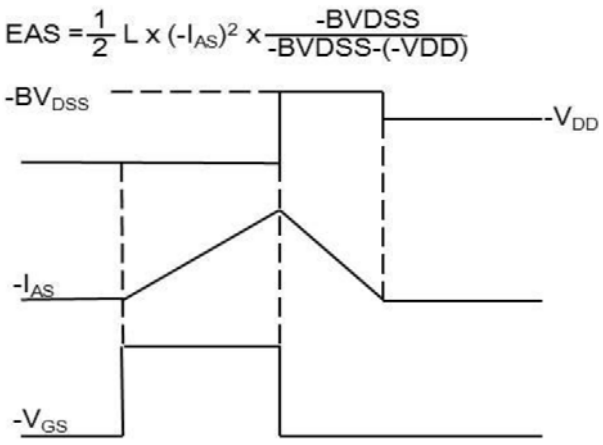
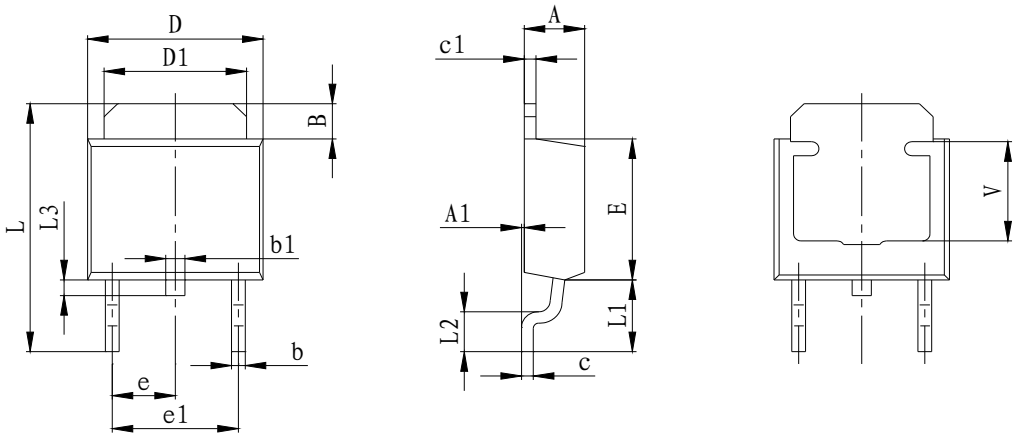


Figure 8: EAS Waveform



PACKAGE MECHANICAL DATA

TO-252 Package Dimension



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
B	1.350	1.650	0.053	0.065
b	0.500	0.700	0.020	0.028
b1	0.700	0.900	0.028	0.035
c	0.430	0.580	0.017	0.023
c1	0.430	0.580	0.017	0.023
D	6.350	6.650	0.250	0.262
D1	5.200	5.400	0.205	0.213
E	5.400	5.700	0.213	0.224
e	2.300 TYP.		0.091 TYP.	
e1	4.500	4.700	0.177	0.185
L	9.500	9.900	0.374	0.390
L1	2.550	2.900	0.100	0.114
L2	1.400	1.780	0.055	0.070
L3	0.600	0.900	0.024	0.035
V	3.800 REF.		0.150 REF.	