

Description:

This N-Channel MOSFET uses advanced trench technology and design to provide excellent $R_{DS(on)}$ with low gate charge.

It can be used in a wide variety of applications.



TO-252

Features:

- 1) $V_{DS}=30V, I_D=55A, R_{DS(on)} < 10m\Omega @ V_{GS}=10V$
- 2) Low gate charge.
- 3) Green device available.
- 4) Advanced high cell density trench technology for ultra low $R_{DS(on)}$.
- 5) Excellent package for good heat dissipation.



Absolute Maximum Ratings: ($T_C=25^\circ C$ unless otherwise noted)

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Continuous Drain Current- $T_C=25^\circ C^1$	55	A
	Continuous Drain Current- $T_C=100^\circ C$	30	
	Pulsed Drain Current ²	112	
E_{AS}	Single Pulse Avalanche Energy ³	24.2	mJ
I_{AS}	Avalanche Current	22	A
P_D	Power Dissipation, $T_C=25^\circ C^4$	37.5	W
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +175	$^\circ C$

Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case ¹	4	$^\circ C/W$
$R_{\theta JA}$	Thermal Resistance Junction-Ambient ¹	62	$^\circ C/W$

Electrical Characteristics: ($T_C=25^{\circ}\text{C}$ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250 μ A	30	---	---	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{GS} =0V, V _{DS} =30V	---	---	1	μ A
I _{GSS}	Gate-Source Leakage Current	V _{GS} = ± 20V, V _{DS} =0A	---	---	± 100	nA
On Characteristics						
V _{GS(th)}	GATE-Source Threshold Voltage	V _{GS} =V _{DS} , I _D =250 μ A	1.2	---	2.5	V
R _{DS(ON)}	Drain-Source On Resistance ²	V _{GS} =10V, I _D =30A	---	7.5	10	m Ω
		V _{GS} =4.5V, I _D =15A	---	11	18	
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =15V, V _{GS} =0V, f=1MHz	---	940	---	pF
C _{oss}	Output Capacitance		---	131	---	
C _{rss}	Reverse Transfer Capacitance		---	109	---	
Switching Characteristics						
t _{d(on)}	Turn-On Delay Time	V _{DD} =15V, I _D =15A, V _{GS} =10V, R _{GEN} =3.3Ω	---	4	---	ns
t _r	Rise Time		---	8	---	ns
t _{d(off)}	Turn-Off Delay Time		---	31	---	ns
t _f	Fall Time		---	4	---	ns
Q _g	Total Gate Charge	V _{GS} =4.5V, V _{DS} =15V, I _D =15A	---	9.8	---	nC
Q _{gs}	Gate-Source Charge		---	4.2	---	nC
Q _{gd}	Gate-Drain “Miller” Charge		---	3.6	---	nC
Drain-Source Diode Characteristics						

V_{SD}	Source-Drain Diode Forward Voltage	V _{GS} =0V, I _S =1A	---	---	1	V
I_S	Continuous Source Current ^{1,5}	V _G =V _D =0V, Force Current	---	---	43	A
I_{SM}	Pulsed Source Current ^{2,5}		---	---	112	Ns
T_{rr}	Reverse Recovery Time	I _F =30A, dI/dt=100A/μs, T _J =25°C	---	8.5	---	
Q_{rr}	Reverse Recovery Charge		---	2.2	---	

Notes:

1. The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
2. The data tested by pulsed, pulse width ≤ 300μs, duty cycle ≤ 2%
3. The EAS data shows Max. rating. The test condition is V_{DD}=25V, V_{GS}=10V, L=0.1mH, I_{AS}=22A
4. The power dissipation is limited by 175°C junction temperature
5. The data is theoretically the same as I_D and I_{DM}, in real applications, should be limited by total power dissipation.

Typical Characteristics: (T_C=25°C unless otherwise noted)



Fig.1 Typical Output Characteristics



Fig.2 On-Resistance vs. G-S Voltage



Fig.3 Forward Characteristics of Reverse



Fig.4 Gate-Charge Characteristics

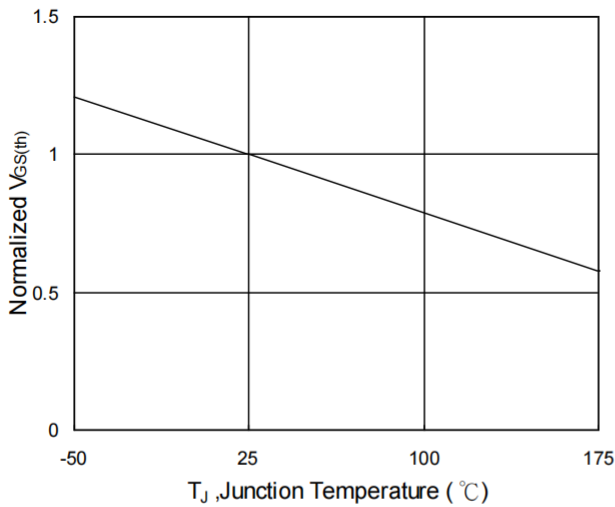


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

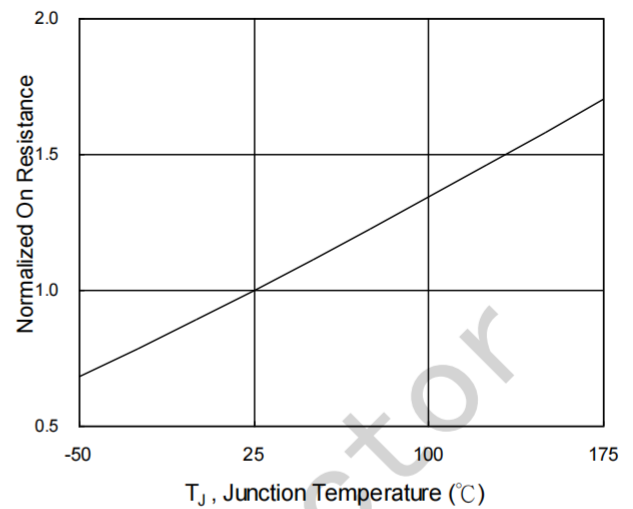


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

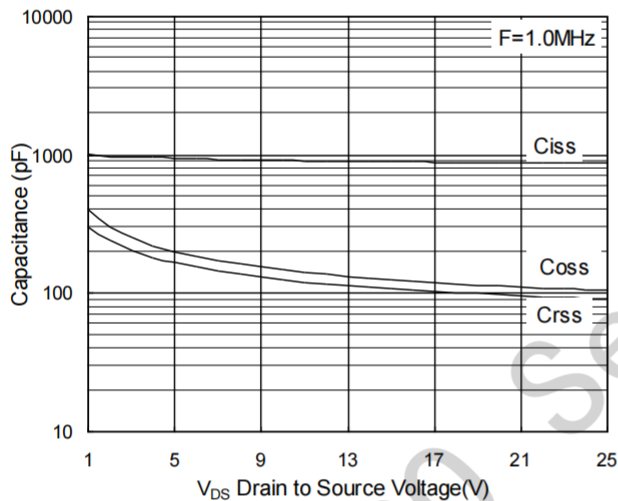


Fig.7 Capacitance

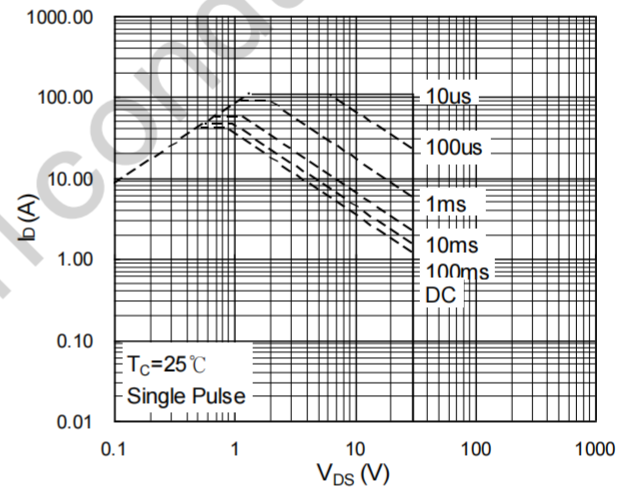


Fig.8 Safe Operating Area



Fig.9 Normalized Maximum Transient Thermal Impedance

Package Information

TO-252



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	6.30	6.90	0.248	0.272
A1	0.00	0.16	0.000	0.006
B	5.70	6.30	0.224	0.248
C	2.10	2.50	0.083	0.098
D	0.30	0.70	0.012	0.028
E1	0.60	0.90	0.024	0.035
E2	0.70	1.00	0.028	0.039
F	0.30	0.60	0.012	0.024
G	0.70	1.20	0.028	0.047
L1	9.60	10.50	0.378	0.413
L2	2.70	3.10	0.106	0.122
H	0.40	1.00	0.016	0.039
M	5.10	5.50	0.201	0.217
N	2.09	2.49	0.082	0.098
R	0.30		0.012	
T	1.40	1.60	0.055	0.063
Y	5.10	6.30	0.201	0.248