

TO-252 Plastic-Encapsulate Transistors

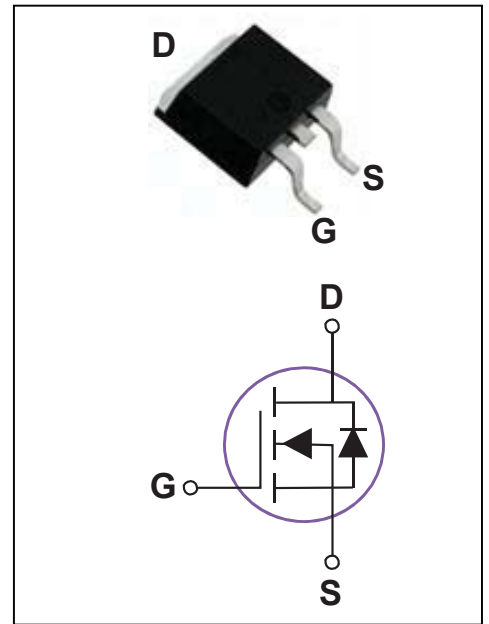
BVDSS	R _{DS(ON)}	I _D
100V	115mΩ	12A

Features

- 100V, 12A , R_{DS(ON)}=115mΩ@V_{GS}=10V
- Improved dv/dt capability
- Fast switching
- 100% EAS Guaranteed
- Green Device Available

Applications

- Networking
- Load Switch
- LED applications



MAXIMUM RATINGS AND CHARACTERISTICS

@ 250C Ambient Temperature (unless otherwise noted)

Parameter	Symbol	Rating	Units
Drain-Source Voltage	V _{DS}	100	V
Gate-Source Voltage	V _{GS}	±20	V
Drain Current – Continuous (T _C =25°C)	I _D	12	A
Drain Current – Continuous (T _C =100°C)		7.6	A
Drain Current – Pulsed ¹	I _{DM}	48	A
Single Pulse Avalanche Energy ²	EAS	6	mJ
Single Pulse Avalanche Current ²	IAS	11	A
Power Dissipation (T _C =25°C)	P _D	34.7	W
Power Dissipation – Derate above 25°C		0.27	W/°C
Storage Temperature Range	T _{STG}	-50 to 150	°C
Operating Junction Temperature Range	T _J	-50 to 150	°C

Thermal Characteristics

Parameter	Symbol	Typ.	Max.	Unit
Thermal Resistance Junction to ambient	R _{θJA}	---	62	°C/W
Thermal Resistance Junction to Case	R _{θJC}	---	3.1	°C/W

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Off Characteristics

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	100	---	---	V
BV_{DSS} Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	Reference to 25°C, $I_D=1mA$	---	0.09	---	V/°C
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=100V, V_{GS}=0V, T_J=25^\circ C$	---	---	1	μA
		$V_{DS}=80V, V_{GS}=0V, T_J=125^\circ C$	---	---	10	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	± 100	nA

On Characteristics

Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=10A$	---	95	115	m Ω
		$V_{GS}=4.5V, I_D=8A$	---	100	125	m Ω
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	1.2	1.6	2.2	V
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}$		---	-5	---	mV/°C
Forward Transconductance	g_{fs}	$V_{DS}=10V, I_D=2A$	---	8.7	---	S

Dynamic and switching Characteristics

Total Gate Charge ^{3,4}	Q_g	$V_{DS}=50V, V_{GS}=10V, I_D=2A$	---	20	40	nC
Gate-Source Charge ^{3,4}	Q_{gs}		---	3.2	6	
Gate-Drain Charge ^{3,4}	Q_{gd}		---	3.6	7	
Turn-On Delay Time ^{3,4}	$T_{d(on)}$	$V_{DD}=50V, V_{GS}=10V, R_G=3.3\Omega$ $I_D=1A$	---	18	36	ns
Rise Time ^{3,4}	T_r		---	4	8	
Turn-Off Delay Time ^{3,4}	$T_{d(off)}$		---	40	80	
Fall Time ^{3,4}	T_f		---	3	6	
Input Capacitance	C_{iss}	$V_{DS}=25V, V_{GS}=0V, F=1MHz$	---	1400	2800	pF
Output Capacitance	C_{oss}		---	60	120	
Reverse Transfer Capacitance	C_{rss}		---	35	70	
Gate resistance	R_g	$V_{GS}=0V, V_{DS}=0V, F=1MHz$	---	2	4	Ω

Drain-Source Diode Characteristics and Maximum Ratings

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Continuous Source Current	I_S	$V_G=V_D=0V, \text{Force Current}$	---	---	12	A
Pulsed Source Current	I_{SM}		---	---	24	A
Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=1A, T_J=25^\circ C$	---	---	1	V
Reverse Recovery Time ³	t_{rr}	$I_S=1A, di/dt=100A/\mu s, T_J=25^\circ C$	---	38	---	ns
Reverse Recovery Charge ³	Q_{rr}		---	27	---	nC

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. $V_{DD}=25V, V_{GS}=10V, L=0.1mH, I_{AS}=11A, R_G=25\Omega, \text{Starting } T_J=25^\circ C$.
3. The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
4. Essentially independent of operating temperature.

RATINGS AND CHARACTERISTIC CURVES

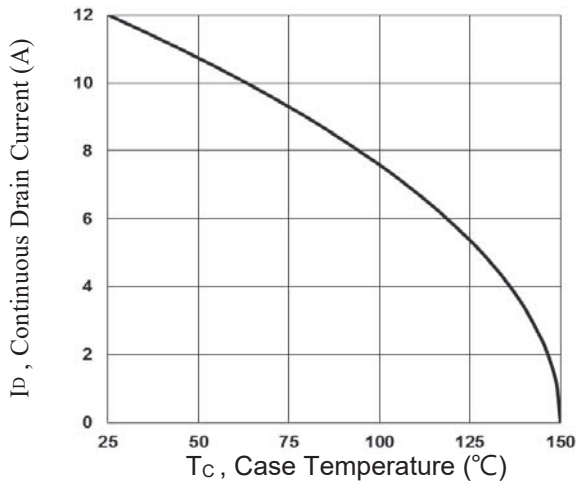


Fig.1 Continuous Drain Current vs. T_c

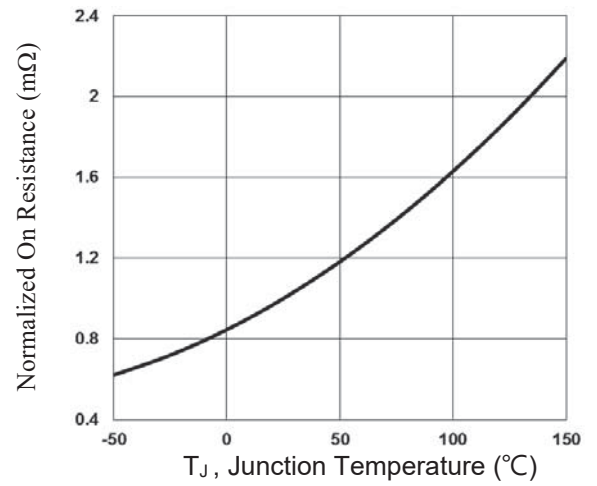


Fig.2 Normalized $R_{DS(on)}$ vs. T_j

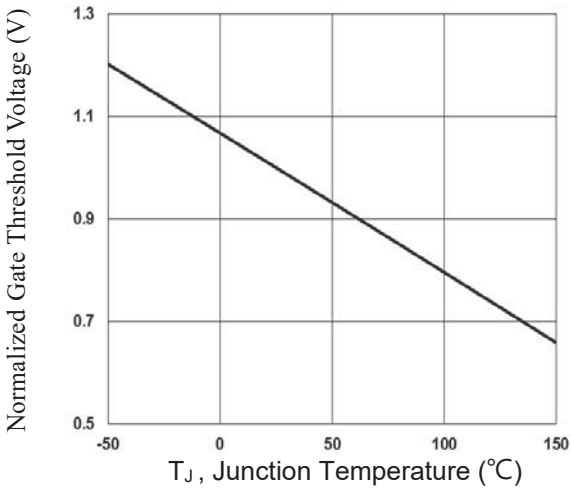


Fig.3 Normalized V_{th} vs. T_j

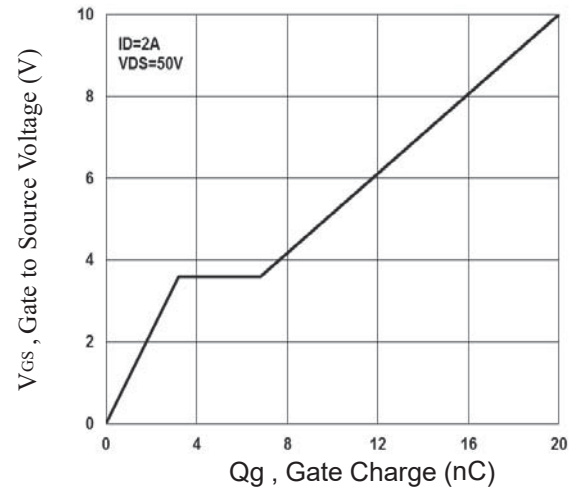


Fig.4 Gate Charge Waveform

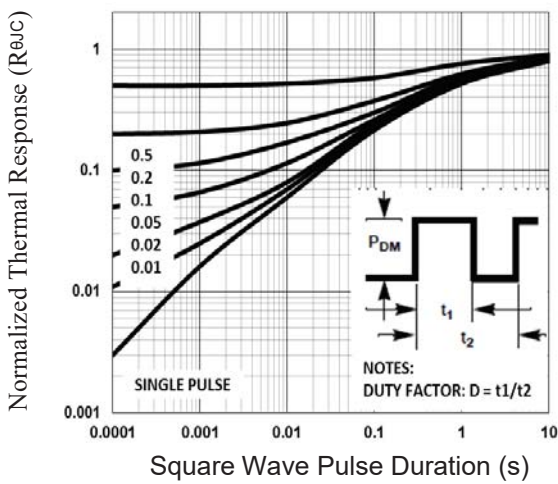


Fig.5 Normalized Transient Impedance

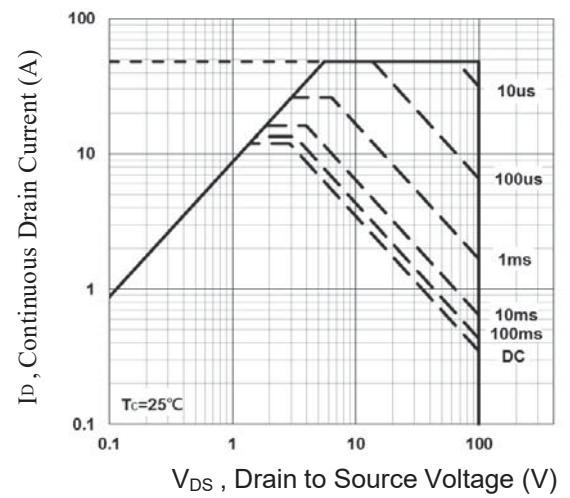


Fig.6 Maximum Safe Operation Area

RATINGS AND CHARACTERISTIC CURVES

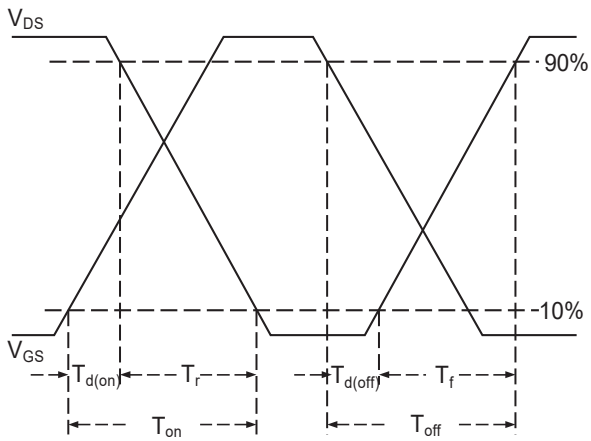


Fig.7 Switching Time Waveform

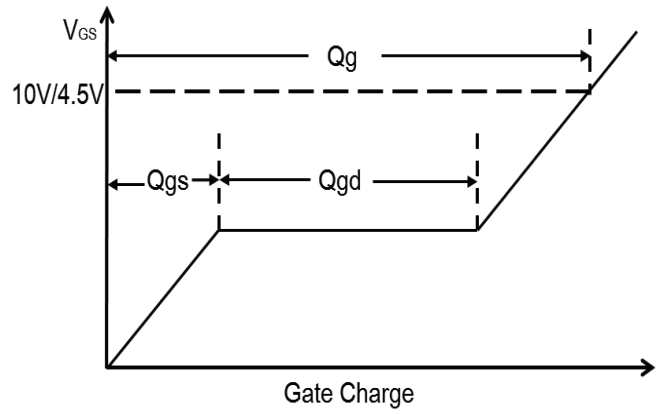
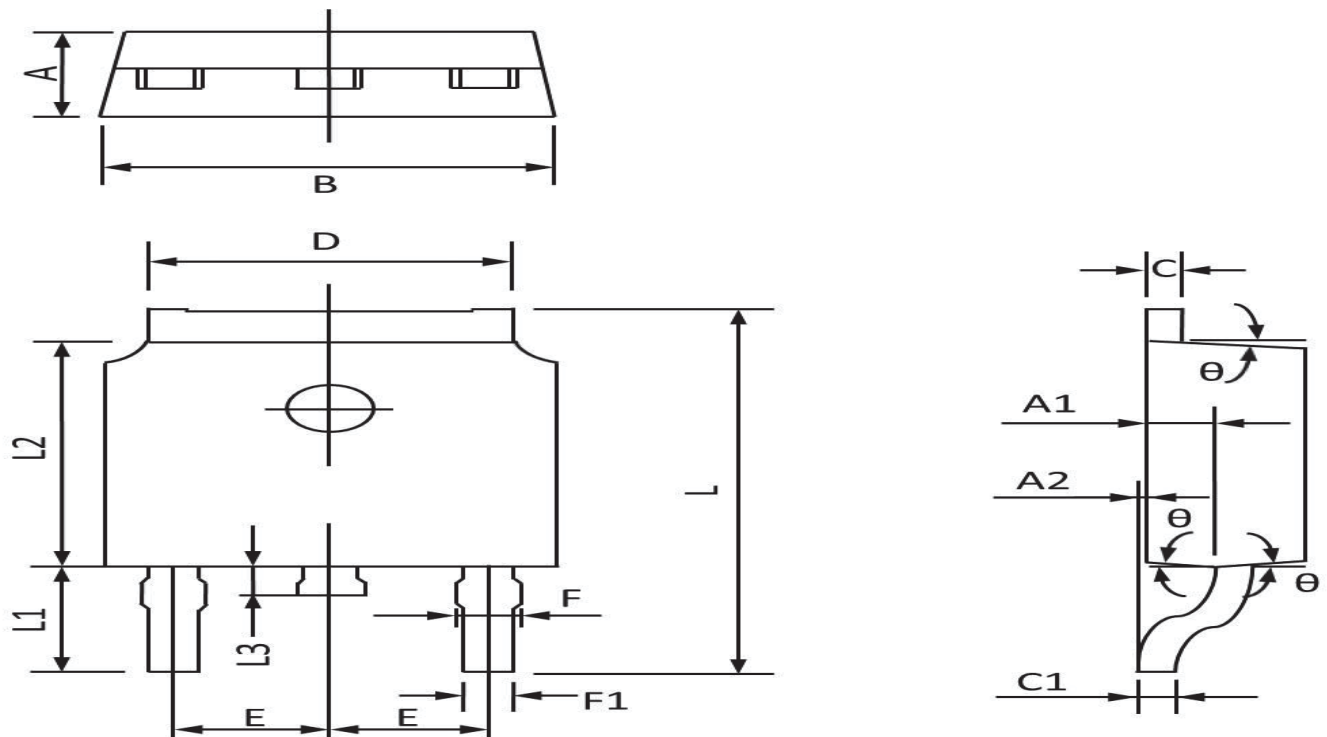


Fig.8 Gate Charge Waveform

TO-252 PACKAGE INFORMATION


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	2.400	2.200	0.094	0.087
A1	1.110	0.910	0.044	0.036
A2	0.150	0.000	0.006	0.000
B	6.800	6.400	0.268	0.252
C	0.580	0.450	0.023	0.018
C1	0.580	0.460	0.023	0.018
D	5.500	5.100	0.217	0.201
E	2.386	2.186	0.094	0.086
F	1.140	0.600	0.045	0.024
F1	0.880	0.500	0.035	0.020
L	10.400	9.400	0.409	0.370
L1	3.000	2.400	0.118	0.094
L2	6.223	5.400	0.245	0.213
L3	1.200	0.600	0.047	0.024
θ	9°	3°	9°	3°