N-Channel 100 V (D-S) MOSFET

PRODUCT SUMMARY

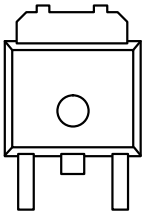
BV_{DSS}	100V
$R_{DSON(MAX.)}$	0.050Ω
I_D	35A

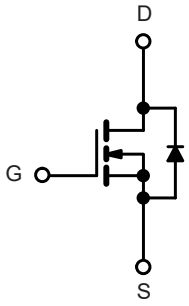
FEATURES

- TrenchFET® Power MOSFETS
- 150 °C Junction Temperature
- Low Thermal Resistance Package

Pb Available
RoHS* COMPLIANT

TO-252





N-Channel MOSFET

Absolute Maximum Ratings(T_C = 25 °C, unless otherwise noted)

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current@10V	T_C = 25 ℃	I_D	35	A
	T_C = 100 ℃		15	
Pulsed Drain Current		I_{DM}	80	A
Single Pulse Avalanche Energy	L = 0.1 mH	E_{AS}	40	mJ
Avalanche Current		I_{AS}	30	A
Total Power Dissipation	T_C = 25 ℃	P_D	43.7	W
Operating Junction and Storage Temperature Range		T_J , T_{STG}	-55 to +150	℃

Thermal Characteristics

Parameter	Symbol	LIMIT.	Unit
Thermal resistance, junction-to-ambient	$R_{\theta JA}$	50	℃/W
Thermal resistance, junction-to-case	$R_{\theta JC}$	3.0	

Electrical Characteristics T_J = 25°C, unless otherwise noted

Parameter		Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics							
Drain-Source Breakdown Voltage		$V_{(BR)DSS}$	V_{GS} = 0 V , I_D = 250 μA	100	-	-	V
Gate-body Leakage current		I_{GSS}	V_{DS} = 0 V , V_{GS} = ± 20 V			± 100	nA
Zero Gate Voltage Drain Current	T_J = 25℃	I_{DSS}	V_{DS} = 100 V , V_{GS} = 0 V	-	-	1	μA
	T_J = 100℃			-	-	100	
Gate-Threshold Voltage		$V_{GS(th)}$	V_{DS} = V_{GS} , I_D = 250 μA	1		2.5	V
Drain-Source On-Resistance		$R_{DS(on)}$	V_{GS} = 10 V , I_D = 5 A	-	0.038	0.050	Ω
			V_{GS} = 4.5 V , I_D = 3 A	-	0.043	0.056	
Forward Transconductance		g_{fs}	V_{DS} = 5 V , I_D = 5 A	-	12	-	S
Dynamic Characteristics							
Input Capacitance		C_{iss}	V_{DS} = 15 V , V_{GS} = 0 V , f = 1 MHz	-	2422	-	pF
Output Capacitance		C_{oss}		-	101	-	
Reverse Transfer Capacitance		C_{rss}		-	86	-	
Switching Characteristics							
Total Gate Charge		Q_g	V_{GS} = 10 V , V_{DS} = 50 V , I_D = 5 A	-	40.8	-	nC
Gate-Source Charge		Q_{gs}		-	10	-	
Gate-Drain Charge		Q_{gd}		-	6.9	-	
Turn-On Delay Time		$t_{d(on)}$	V_{DD} = 50 V , I_D ≡ 5 A , V_{GEN} = 10 V , R_G = 2.5 Ω	-	8.9	-	nS
Rise Time		t_r		-	43	-	
Turn-Off Delay Time		$t_{d(off)}$		-	42	-	
Fall Time		t_f		-	32	-	
Drain-Source Body Diode Characteristics							
Diode Forward Voltage		V_{SD}	I_S = - 1 A , V_{GS} = 0 V	-	-	1.2	V
Continuous Source-Dranin Diode Current		I_S	T_J = 25 °C	-	-	35	A
Continuous Source Current		I_{SM}		-	-	90	
Reverse Recovery Time		t_{rr}	T_J = 25 °C , I_F = 20 A , dI/dt = 100 A/μs	-	45	100	ns

a. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$=150°C.

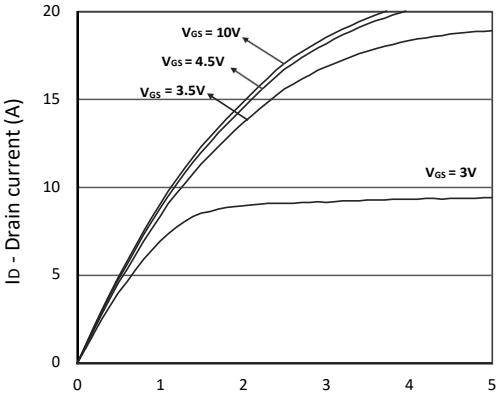
b. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2% .

c. The EAS data shows Max. rating . The test condition is V_{DD}=25V,V_{GS}=10V,L=0.1mH,I_{AS}=8A

d. The power dissipation is limited by 150°C junction temperature

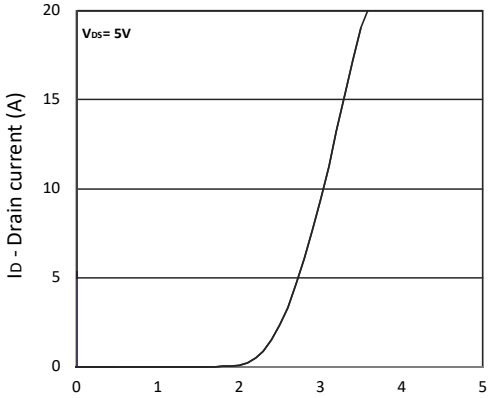
e. The data is theoretically the same as ID and I_{DM}, in real applications , should be limited by total power dissipation.

TYPICAL CHARACTERISTICS (25 °C unless noted)



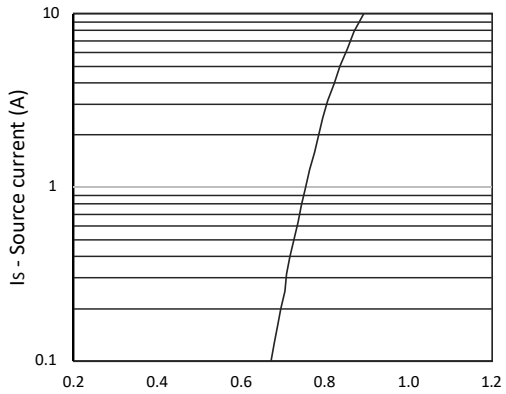
VDS - Drain−source voltage (V)

Output Characteristics



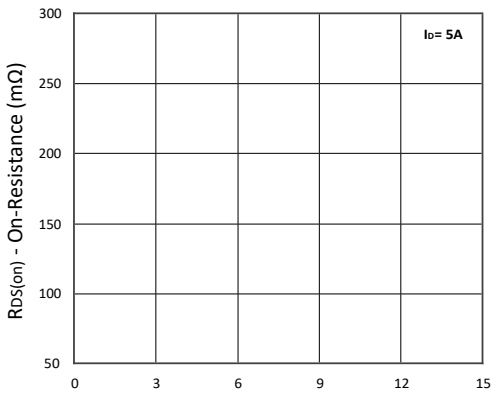
VGS - Gate−source voltage (V)

Transfer Characteristics



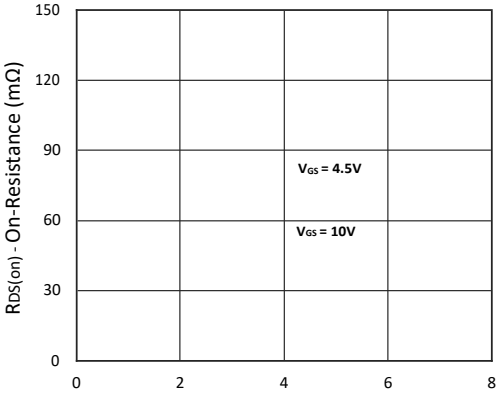
VSD - Source−drain voltage (V)

Forward Characteristics of Reverse



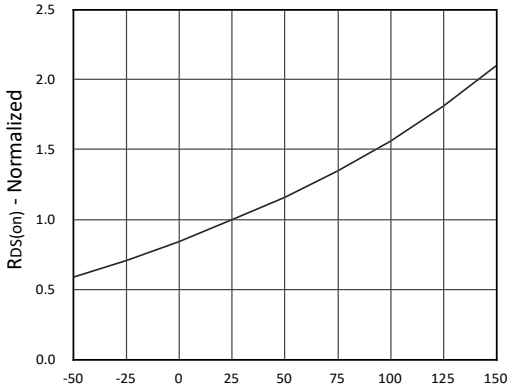
VGS - Gate−source voltage (V)

$R_{DS(ON)}$ vs. V_{GS}



ID - Drain current (A)

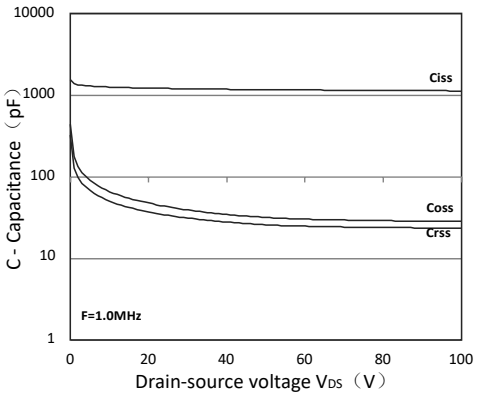
$R_{DS(ON)}$ vs. I_D



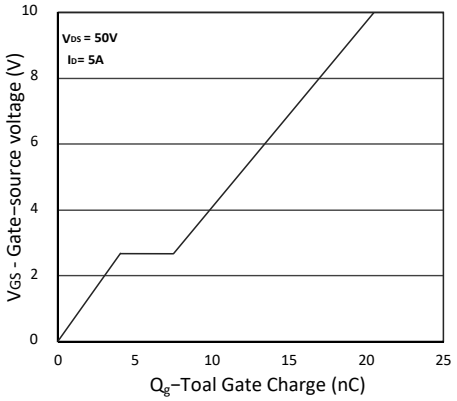
TJ - Temperature (°C)

Normalized $R_{DS(on)}$ vs. Temperature

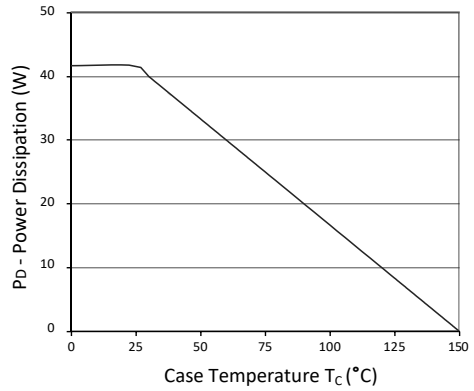
TYPICAL CHARACTERISTICS (25 °C unless noted)



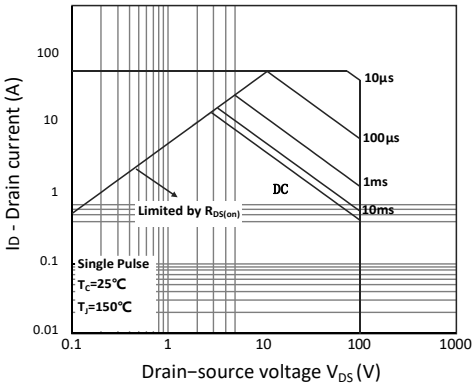
Capacitance Characteristics



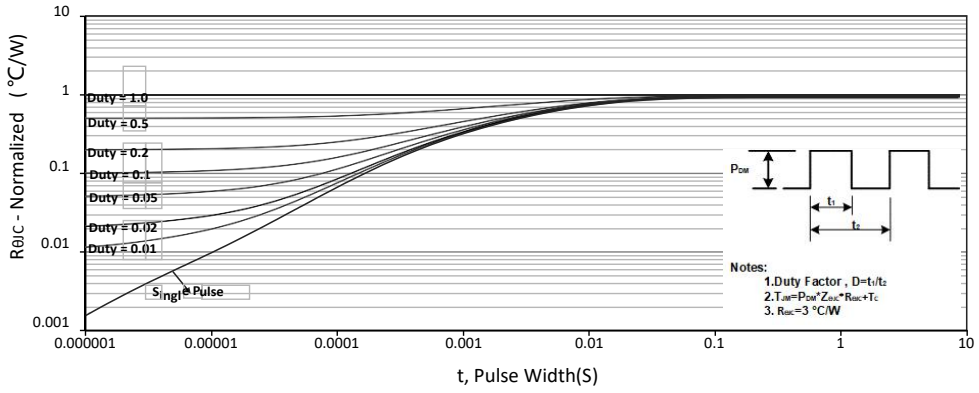
Gate Charge Characteristics



Power Dissipation



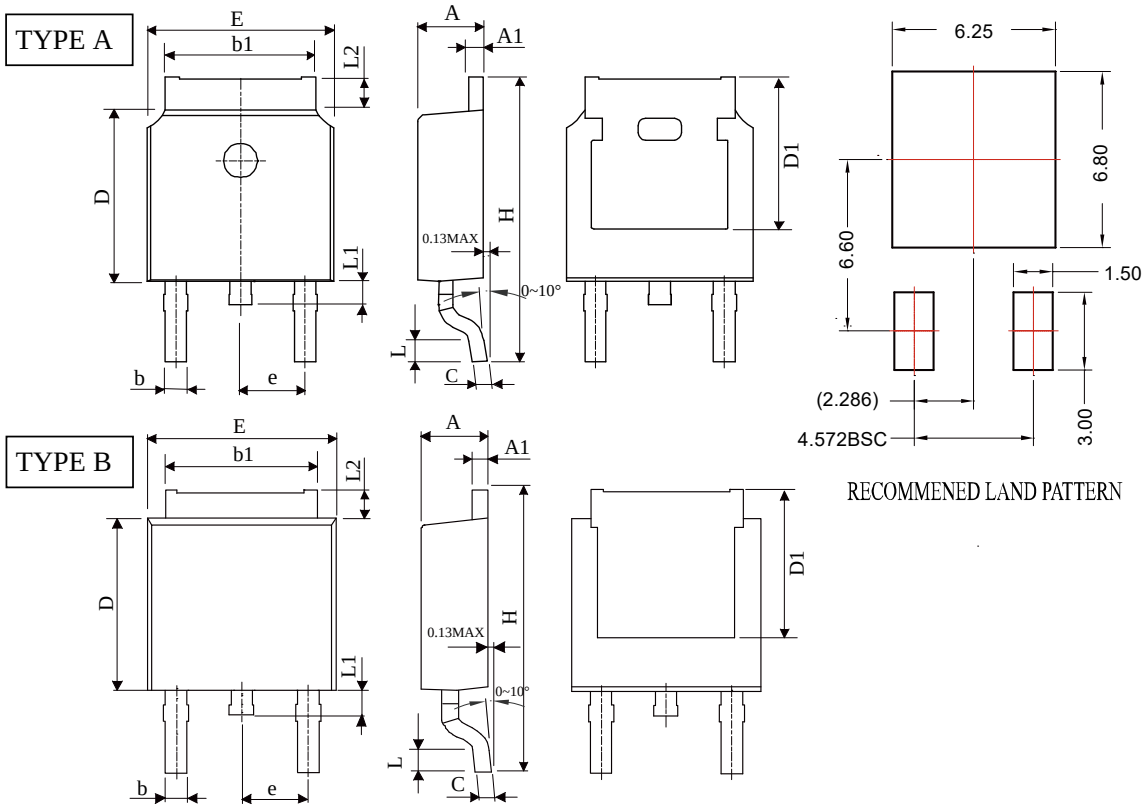
Safe Operating Area



Normalized Maximum Transient Thermal Impedance

TO-252

Unit: mm



SYMBOLS	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	2.20	2.40	0.087	0.094
A1	0.45	0.89	0.018	0.035
b	0.50	0.90	0.019	0.035
b1	4.95	5.59	0.195	0.220
C	0.40	0.61	0.016	0.024
D	5.40	6.63	0.213	0.261
E	6.05	7.10	0.238	0.280
e	1.98	2.59	0.078	0.102
H	8.80	10.6	0.346	0.417
L	0.25	1.350	0.010	0.053
L1	0.50	1.20	0.020	0.047
L2	0.70	1.78	0.028	0.070
D1	5.00	5.60	0.197	0.220