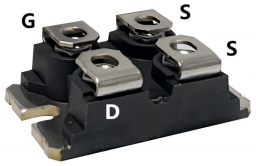
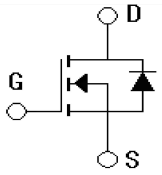
Features

- N-Channel，Low $R_{DS(on)}$
- High Current Handling Capability
- Fast Intrinsic Diode
- Avalanche Rated



Applications

- DC-DC Converter
- UPS
- AC Motor Drives
- Battery Chargers
- Switched-Mode and Resonant-Mode Power Supplies



Absolute Ratings (Tc=25℃)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	650	V
Drain Current -continuous	I_D	170	A
Drain Current - pulse*	I_{DM}	340	A
Gate-Source Voltage	V_{GSS}	±30	V
Single Pulsed Avalanche Energy	E_{AS}	5	J
Power Dissipation	PD	860	W
Operating and Storage Temperature Range	T_j,T_{STG}	-55~+150	℃
Maximum Lead Temperature for Soldering Purposes	T_L	300	℃

*Drain current limited by maximum junction temperature

Electrical Characteristics(T_{CASE}=25℃ unless otherwise specified)

Parameter	Symbol	Tests conditions	Min	Type	Max	Units
Off-Characteristics						
Drain-Source Voltage	BV_{DSS}	I_D=3mA,V_{GS}=0V	650	-	-	V
Drain cut-off current	I_{DSS}	V_{DS}=650V,V_{GS}=0V Tj=25℃	-	-	50	μA
Gate-body leakage current,forward	I_{GSSF}	V_{DS}=0V,V_{GS}=30V	-	-	200	nA
Gate-body leakage current,reverse	I_{GSSR}	V_{DS}=0V,V_{GS}=-30V	-	-	-200	nA

On-Characteristics						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250uA	3.0	-	5.0	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V,I_D=35A	-	18	-	mΩ
Forward transconductance	Gfs	V_{DS}=10V,I_D=60A	-	90	-	S
Dynamic Characteristics						
Input capacitance	Ciss	VDS=25V, VGS=0V, f=1MHz	-	25	-	nF
Output capacitance	Coss		-	15	-	nF
Reverse transfer capacitance	Crss		-	10	-	pF
Switching Characteristics						
Turn-On delay time	td(on)	V_{DD}=325V,I_D=85A Rg=1Ω	-	60	-	ns
Turn-On rise time	t_r		-	13	-	ns
Turn-Off delay time	$T_{d(off)}$		-	120	-	ns
Turn-Off Fall time	t_f		-	5	-	ns
Total Gate Charge	Qg	V_{DS}=325V, I_D=85A, V_{GS}=10V	-	360	-	nC
Gate-Source charge	Qgs		-	135	-	nC
Gate-Drain charge	Qgd		-	98	-	nC
Drain-Source Diode Characteristics and Maximum Ratings						
Drain-Source Diode Forward Voltage	V_{SD}	VGS=0V,IS=100A, (note1)	-	-	1.4	V
Maximum Continuous Drain-Source Diode Forward Current	I_S		-	170	-	A
Reverse recovery time	trr	IF=85A dIF/dt=100A/us VR=100V	-	200	-	ns
Reverse recovery charge	Qrr		-	750	-	nC

Thermal Characteristic

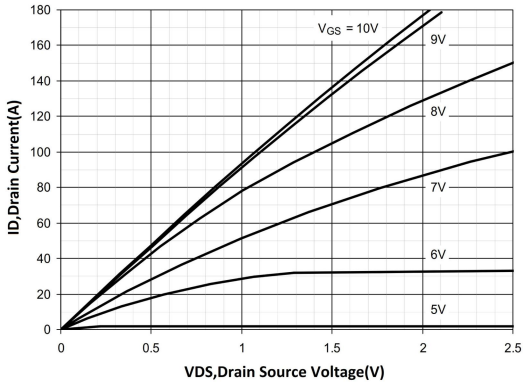
Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.145	℃/W

Notes:

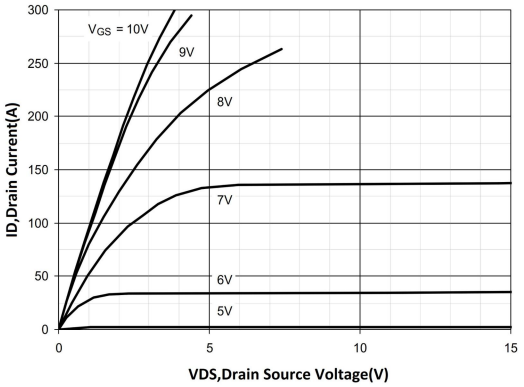
1. Pulse test, t ≦ 300μs, duty cycle, d ≦ 2%.

Typical Electrical and Thermal Characteristics (Curves)

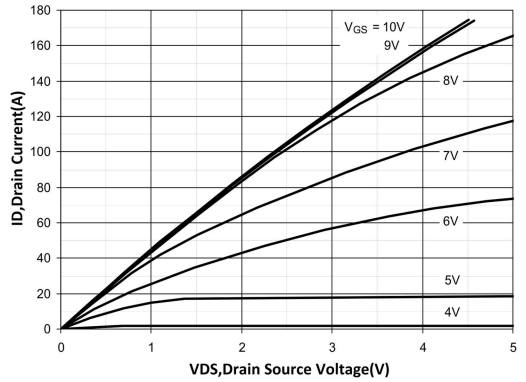
Output Characteristics @ T_J = 25ºC



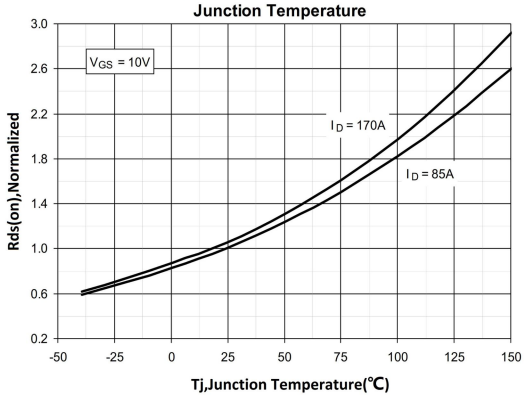
Extended Output Characteristics @ T_J = 25ºC



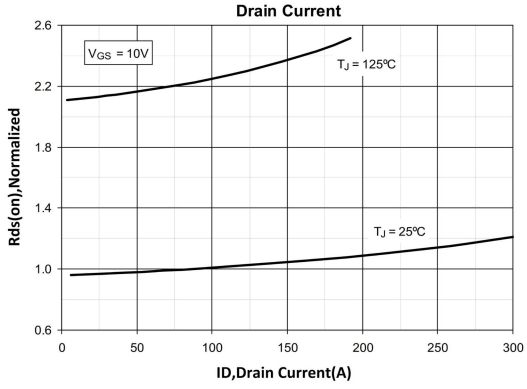
Output Characteristics @ T_J = 125ºC



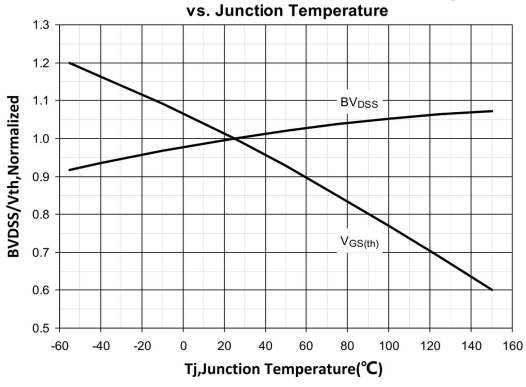
$R_{DS(on)}$ Normalized to I_D = 85A Value vs. Junction Temperature



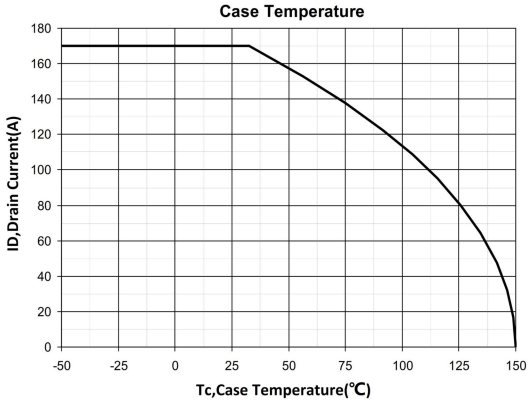
$R_{DS(on)}$ Normalized to I_D = 85A Value vs. Drain Current



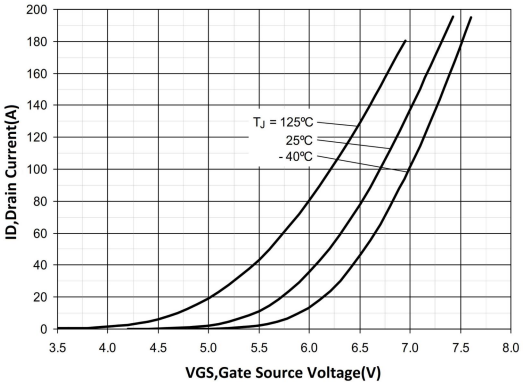
Normalized Breakdown & Threshold Voltages vs. Junction Temperature



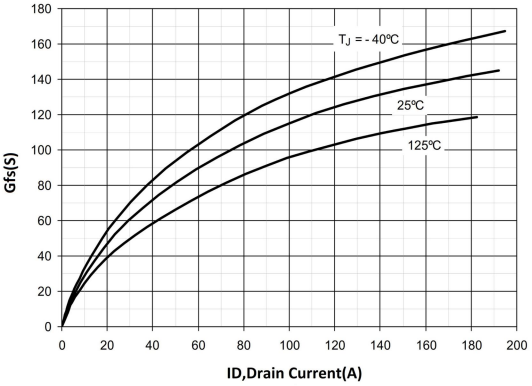
Maximum Drain Current vs. Case Temperature



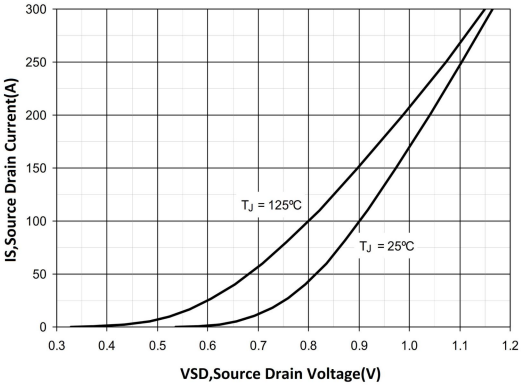
Input Admittance



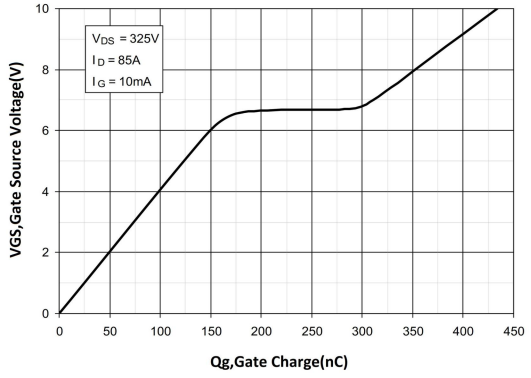
Transconductance



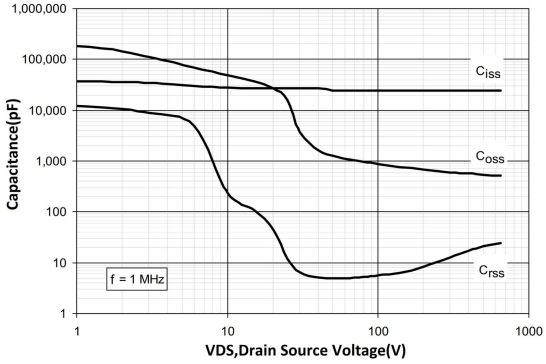
Forward Voltage Drop of Intrinsic Diode

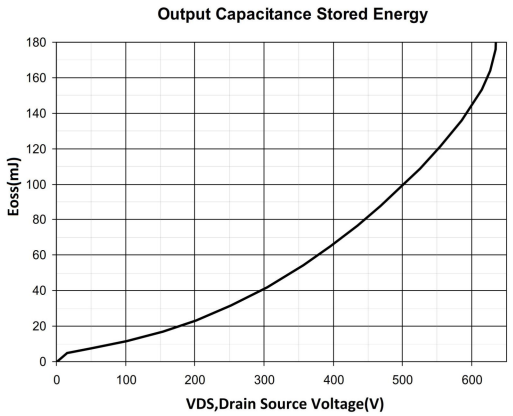


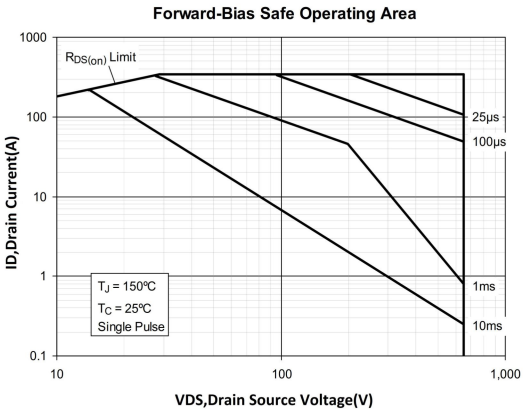
Gate Charge

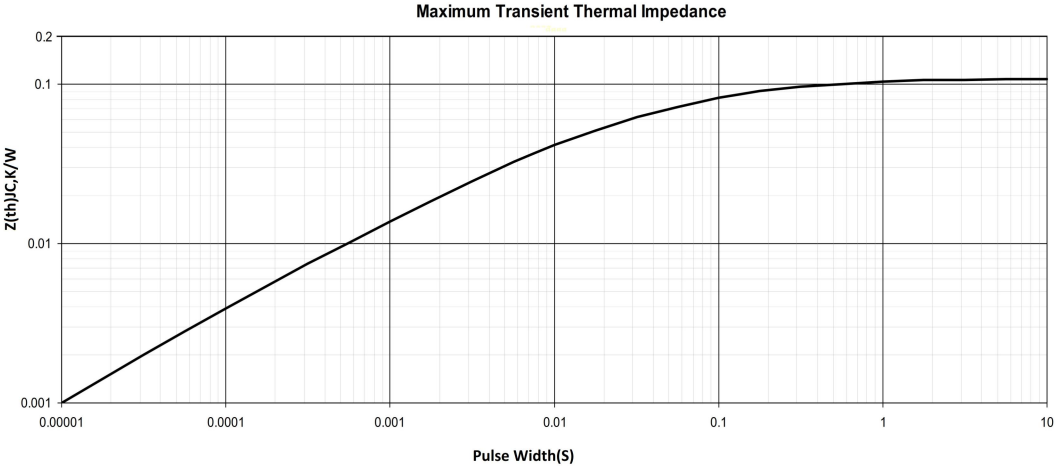


Capacitance

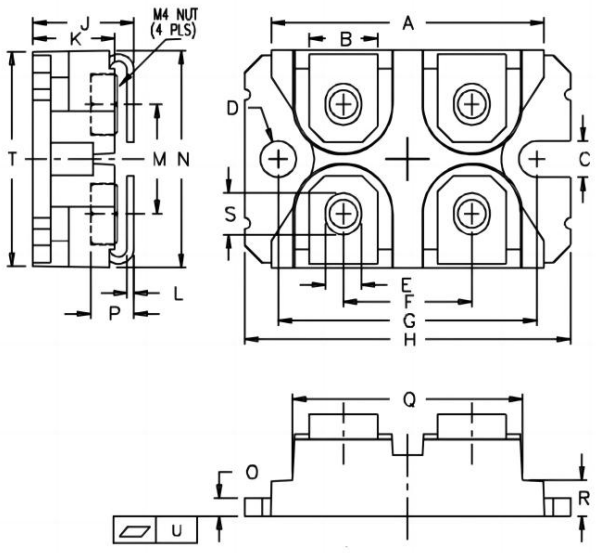








Package Mechanical DATA



Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	31.50	31.88	1.240	1.255
B	7.80	8.20	0.307	0.323
C	4.09	4.29	0.161	0.169
D	4.09	4.29	0.161	0.169
E	4.09	4.29	0.161	0.169
F	14.91	15.11	0.587	0.595
G	30.12	30.30	1.186	1.193
H	38.00	38.23	1.496	1.505
J	11.68	12.22	0.460	0.481
K	8.92	9.60	0.351	0.378
L	0.76	0.84	0.030	0.033
M	12.60	12.85	0.496	0.506
N	25.15	25.42	0.990	1.001
O	1.98	2.13	0.078	0.084
P	4.95	5.97	0.195	0.235
Q	26.54	26.90	1.045	1.059
R	3.94	4.42	0.155	0.174
S	4.72	4.85	0.186	0.191
T	24.59	25.07	0.968	0.987
U	-0.05	0.1	-0.002	0.004