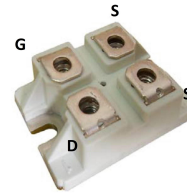


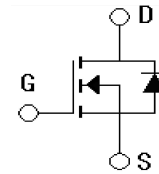
## Features

- 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 ( $T_c=25^\circ\text{C}$ )

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DSS}$	250	V
Drain Current -continuous	$I_D$	170	A
Drain Current - pulse*	$I_{DM}$	500	A
Gate-Source Voltage	$V_{GSS}$	$\pm 20$	V
Single Pulsed Avalanche Energy	$E_{AS}$	5	J
Power Dissipation	PD	860	W
Operating and Storage Temperature Range	$T_j, T_{STG}$	$-55 \sim +150$	$^\circ\text{C}$
Maximum Lead Temperature for Soldering Purposes	$T_L$	300	$^\circ\text{C}$

\*Drain current limited by maximum junction temperature

## Electrical Characteristics ( $T_{CASE}=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Tests conditions	Min	Type	Max	Units
<b>Off-Characteristics</b>						
Drain-Source Voltage	$BV_{DSS}$	$I_D=3\text{mA}, V_{GS}=0\text{V}$	250	-	-	V
Drain cut-off current	$I_{DSS}$	$V_{DS}=40\text{V}, V_{GS}=0\text{V}$ $T_j=25^\circ\text{C}$	-	-	50	$\mu\text{A}$
Gate-body leakage current, forward	$I_{GSSF}$	$V_{DS}=0\text{V}, V_{GS}=20\text{V}$	-	-	200	nA
Gate-body leakage current, reverse	$I_{GSSR}$	$V_{DS}=0\text{V}, V_{GS}=-20\text{V}$	-	-	-200	nA

On-Characteristics						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	3.0	-	5.0	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=35A$	-	19.5	-	m $\Omega$
Forward transconductance	Gfs	$V_{DS}=20V, I_D=60A$	-	140	-	S
Dynamic Characteristics						
Input capacitance	Ciss	$V_{DS}=25V,$ $V_{GS}=0V,$ $f=1MHz$	-	23	-	nF
Output capacitance	Coss		-	2000	-	pF
Reverse transfer capacitance	Crss		-	45	-	pF
Switching Characteristics						
Turn-On delay time	$t_{d(on)}$	$V_{DD}=125V, I_D=90A$ $R_g=1\Omega$	-	33	-	ns
Turn-On rise time	$t_r$		-	50	-	ns
Turn-Off delay time	$T_{d(off)}$		-	93	-	ns
Turn-Off Fall time	$t_f$		-	22	-	ns
Total Gate Charge	Qg	$V_{DS}=125V,$ $I_D=90A,$ $V_{GS}=10V$	-	360	-	nC
Gate-Source charge	Qgs		-	135	-	nC
Gate-Drain charge	Qgd		-	63	-	nC
Drain-Source Diode Characteristics and Maximum Ratings						
Drain-Source Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=100A,$ (note1)	-	-	1.2	V
Maximum Continuous Drain-Source Diode Forward Current		$I_S$	-	170	-	A
Reverse recovery time	$t_{rr}$	$I_F=90A$ $dI_F/dt=100A/\mu s$ $V_R=75V$	-	200	-	ns
Reverse recovery charge	Qrr		-	750	-	nC

### Thermal Characteristic

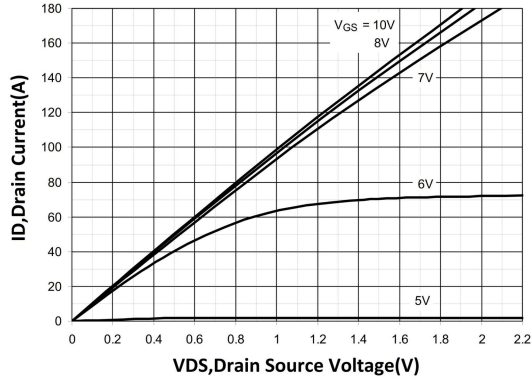
Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.145	$^{\circ}C/W$

Notes:

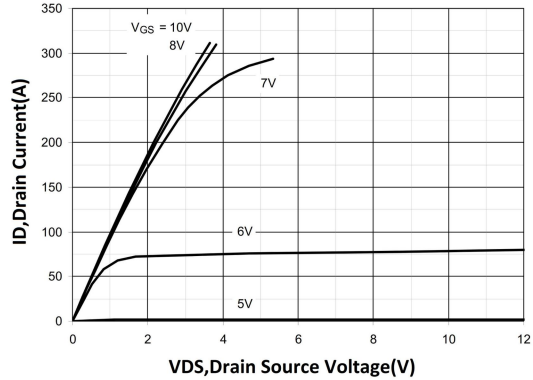
1. Pulse test,  $t \leq 300\mu s$ , duty cycle,  $d \leq 2\%$ .

## Typical Electrical and Thermal Characteristics (Curves)

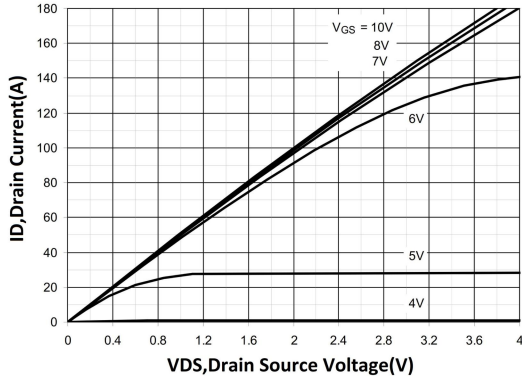
**Output Characteristics@T<sub>j</sub>=25°C**



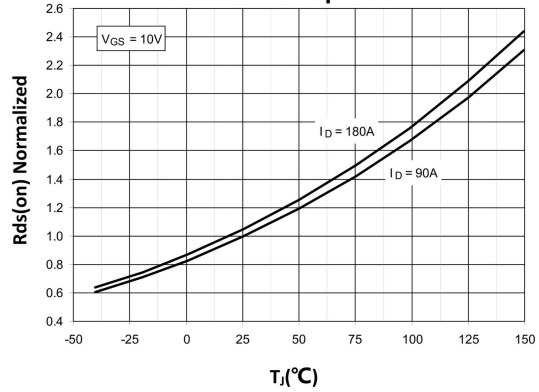
**Extended Output Characteristics@T<sub>j</sub>=25°C**



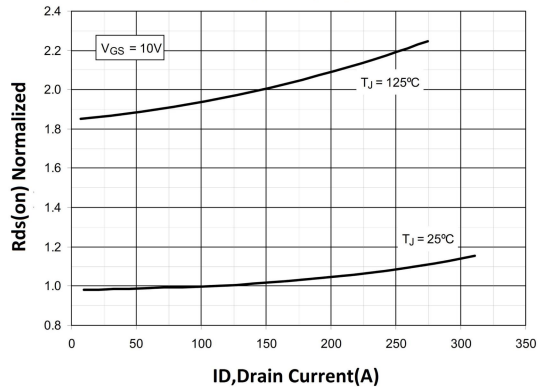
**Output Characteristics@T<sub>j</sub>=125°C**



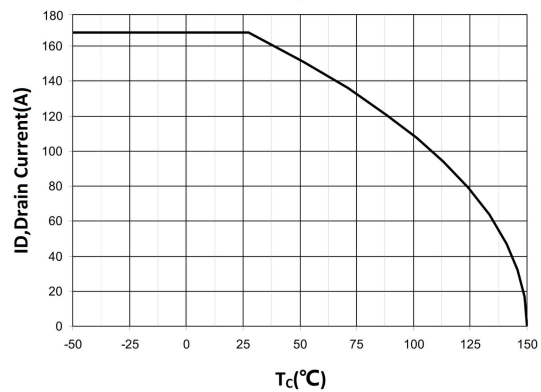
**R<sub>ds(on)</sub> Normalized vs. Junction Temperature**



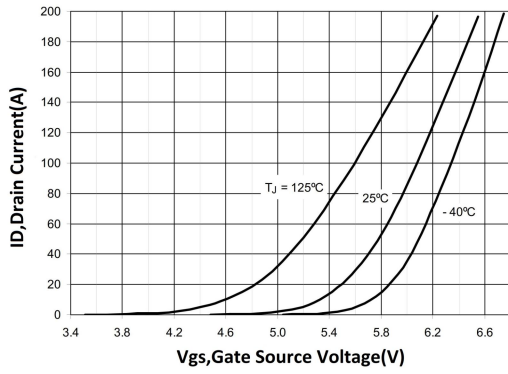
**R<sub>ds(on)</sub> Normalized vs. Drain Current**



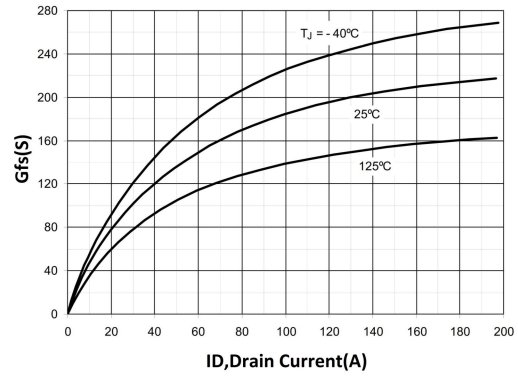
**Maximum Drain Current vs. Case Temperature**



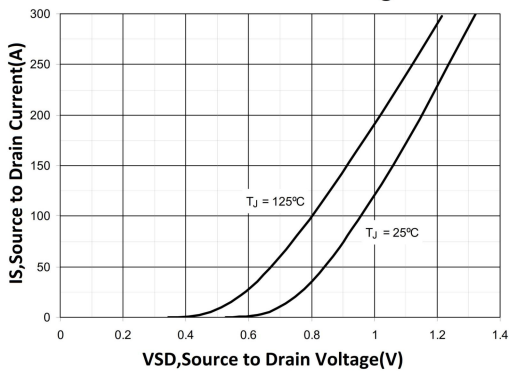
**Input Admittance**



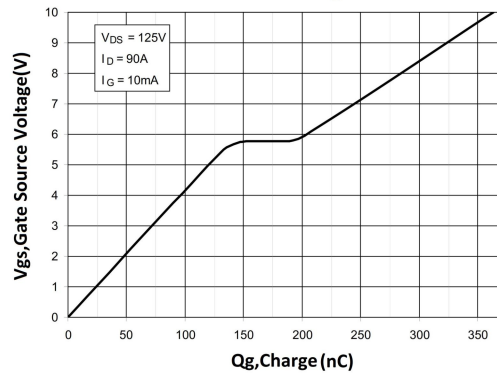
**Transconductance**



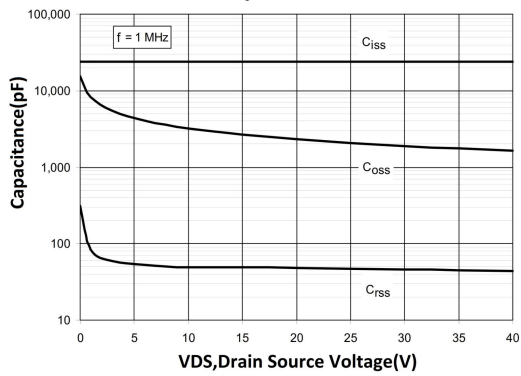
**Diode Forward Voltage**



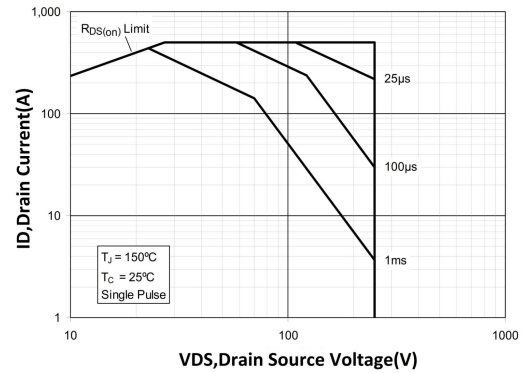
**Gate Charge**



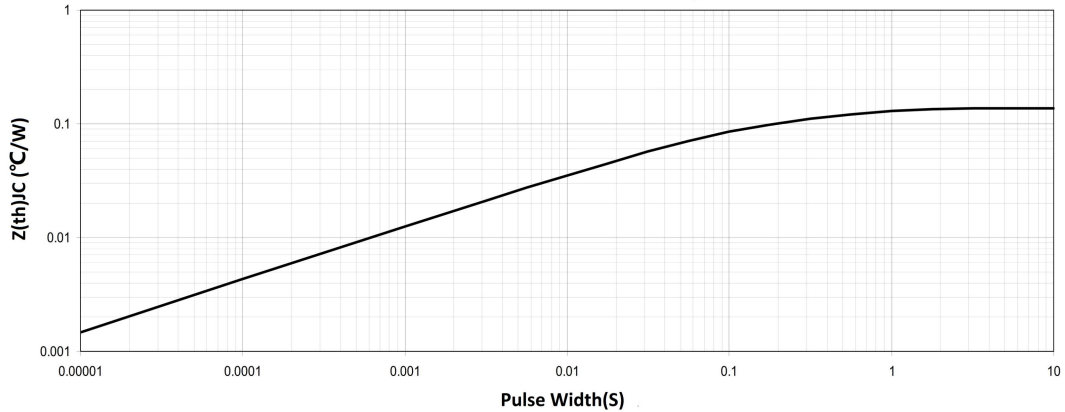
**Capacitance**



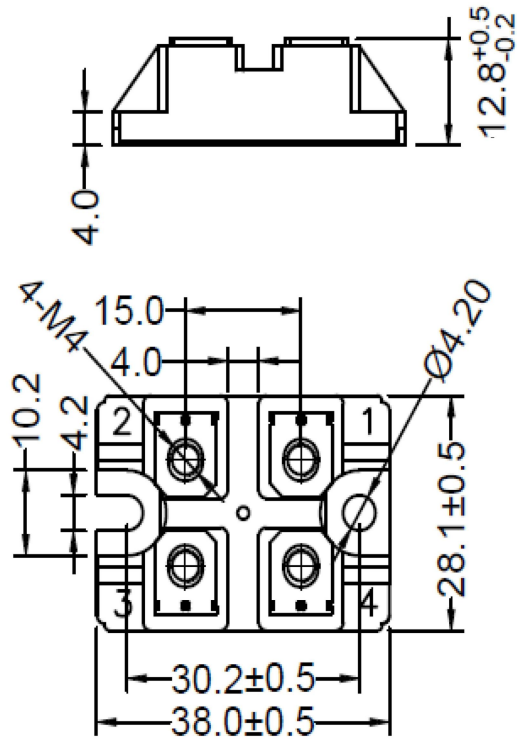
**SOA**



**Maximum Transient Thermal Impedance**



## Package Mechanical DATA



SOT227 Unit:mm