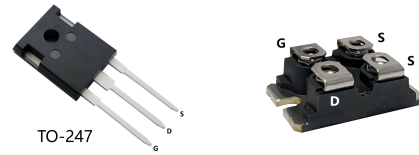


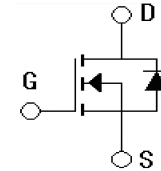
Features

- 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}	150	V
Transient Gate-Source Voltage	V_{GSM}	± 30	V
Continuous Gate-Source Voltage	V_{GSS}	± 20	V
Drain Current -continuous	I_D	170	A
Drain Current - pulse*	I_{DM}	500	A
Single Pulsed Avalanche Energy	E_{AS}	5	J
Power Dissipation TO-247	P_D	313	W
Power Dissipation SOT-227	P_D	925	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
Off-Characteristics						
Drain-Source Voltage	BV_{DSS}	$I_D=3\text{mA}, V_{GS}=0\text{V}$	150	-	-	V
Drain cut-off current	I_{DSS}	$V_{DS}=40\text{V}, V_{GS}=0\text{V}$	-	-	50	μA
Gate-body leakage current	I_{GSS}	$V_{DS}=0\text{V}, V_{GS}=\pm 20\text{V}$	-	-	± 200	nA

On-Characteristics						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250uA	2.0	2.7	3.5	V
Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =100A	-	3.2	4.3	mΩ
Forward transconductance	G _{fs}	V _{DS} =20V, I _D =60A	-	140	-	S
Dynamic Characteristics						
Input capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V, f=1MHz	-	23	-	nF
Output capacitance	C _{oss}		-	2000	-	pF
Reverse transfer capacitance	C _{rss}		-	45	-	pF
Switching Characteristics						
Turn-On delay time	t _{d(on)}	V _{DD} =125V, I _D =90A Rg=1Ω	-	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	Q _g	V _{DS} =125V, I _D =90A, V _{GS} =10V	-	360	-	nC
Gate-Source charge	Q _{gs}		-	135	-	nC
Gate-Drain charge	Q _{gd}		-	63	-	nC
Drain-Source Diode Characteristics and Maximum Ratings						
Drain-Source Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =30A, (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/us V _R =75V	-	200	-	ns
Reverse recovery charge	Q _{rr}		-	750	-	nC

Thermal Characteristic

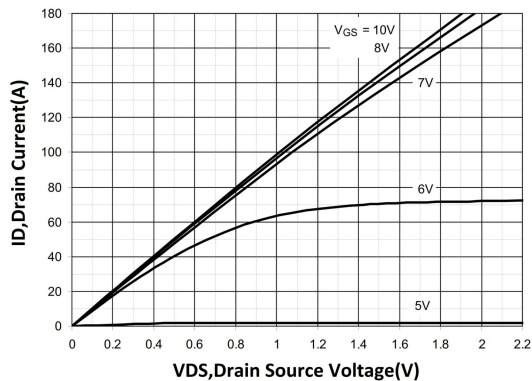
Parameter	Symbol	Value		Unit
		TO-247	SOT-227	
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.4	0.145	$^{\circ}C/W$

Notes:

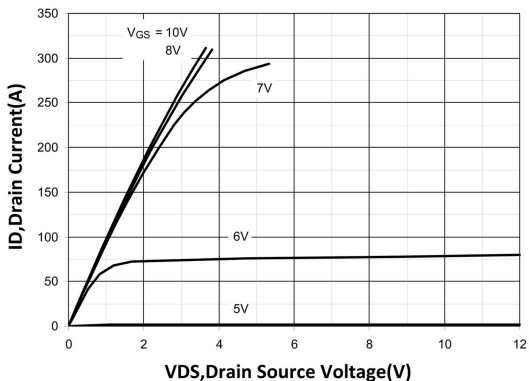
1. Pulse test, $t \leq 300\mu s$, duty cycle, $d \leq 2\%$.

Typical Electrical and Thermal Characteristics (Curves)

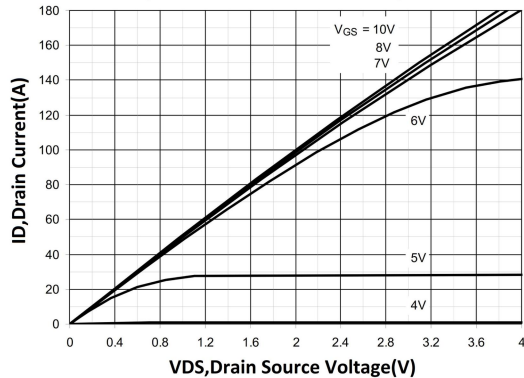
Output Characteristics@T_j=25°C



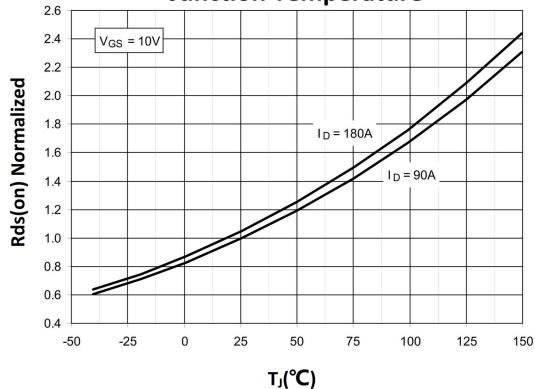
Extended Output Characteristics@T_j=25°C



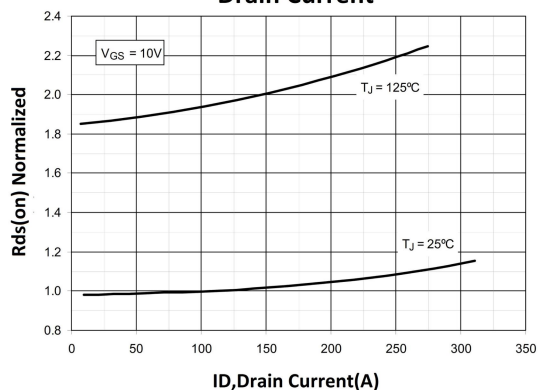
Output Characteristics@T_j=125°C



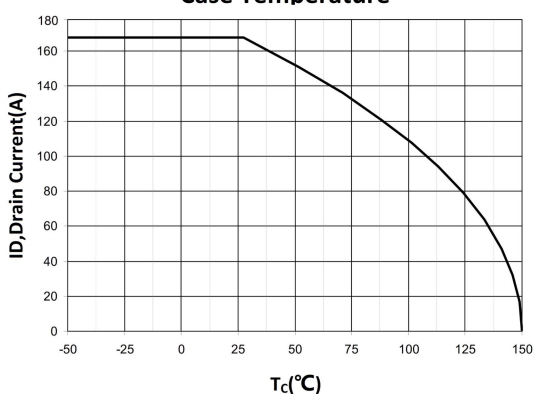
Rds(on) Normalized vs. Junction Temperature



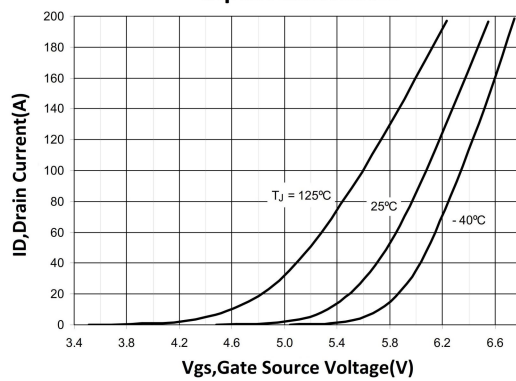
Rds(on) Normalized vs. Drain Current



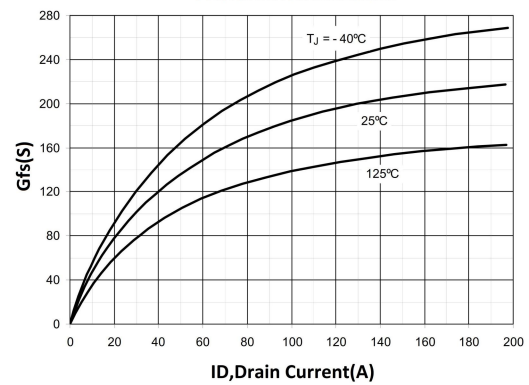
Maximum Drain Current vs. Case Temperature



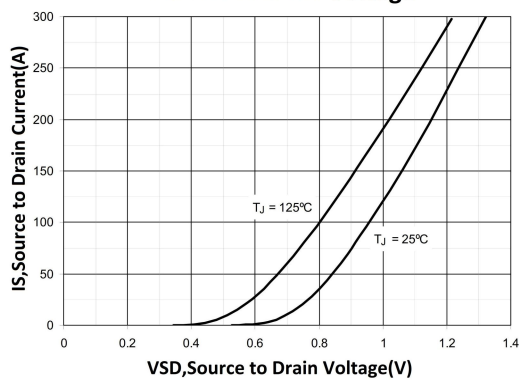
Input Admittance



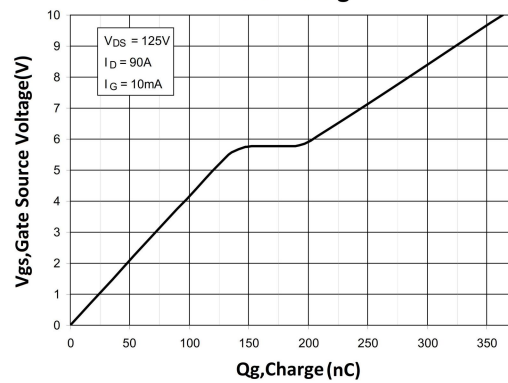
Transconductance



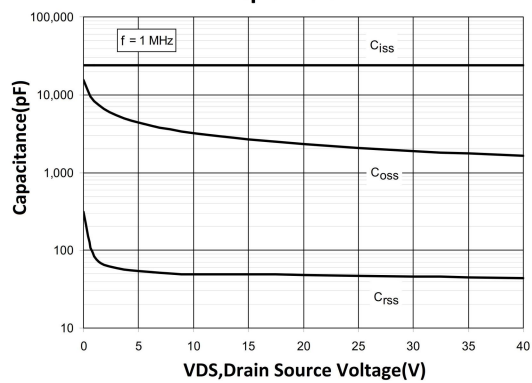
Diode Forward Voltage



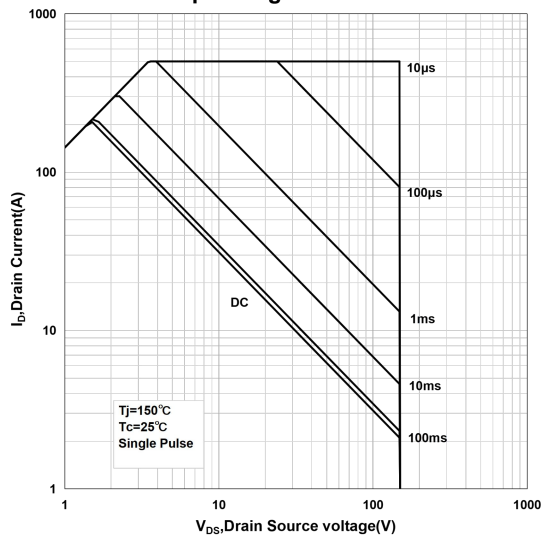
Gate Charge



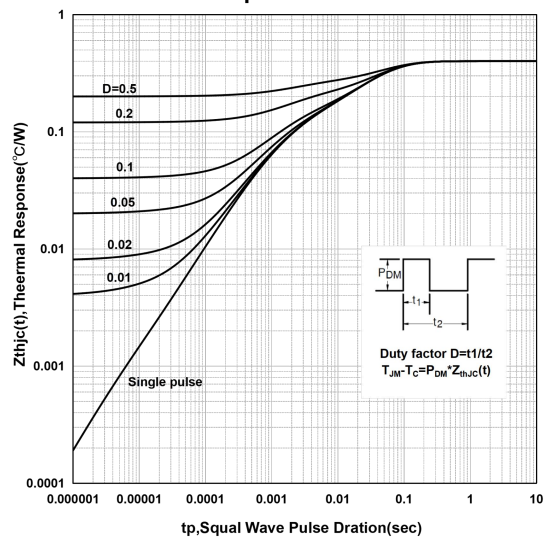
Capacitance



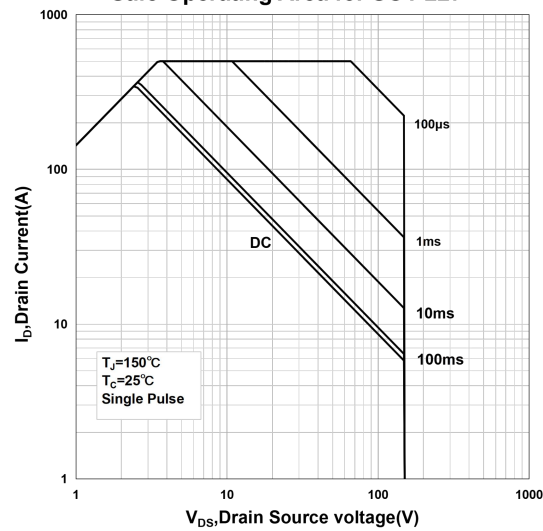
Safe Operating Area for TO-247



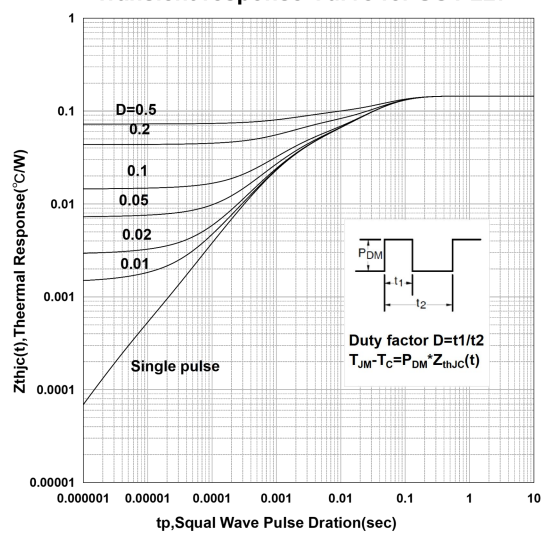
Transient Response Curve for TO-247



Safe Operating Area for SOT-227



Transient response Curve for SOT-227



Package Mechanical DATA

