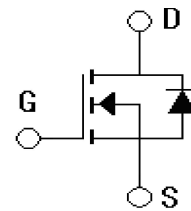
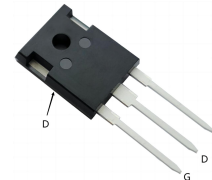
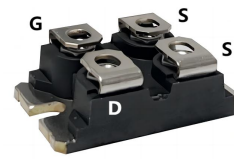


Features

- Low $R_{DS(on)}$
- Fast switching
- 100% avalanche tested
- Low package inductance
- Low intrinsic Rectifier
- High current handing diode



Applications

- DC-DC converters
- Battery chargers
- Switched-mode and resonant-mode power supplies
- DC chopper
- AC motor drives
- Uninterruptible power supplies
- Linear current regulators

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

Parameter	Symbol		Value	Unit
Drain-Source Voltage	V _{DSS}		150	V
Drain Current -continuous	I _D	T=25℃	330	A
		T=100℃	165	A
Drain Current - pulse （note 1）	I _{DM}		1320	A
Gate-Source Voltage	V _{GSS}		±30	V
Single Pulsed Avalanche Energy （note 2）	E _{AS}		4000	mJ
Avalanche Current （note 1）	I _{AR}		100	A
Repetitive Avalanche Current （note 1）	E _{AR}		64	mJ
Peak Diode Recovery dv/dt （note 3）	dv/dt		20	V/ns
Power Dissipation SOT-227	PD TC=25℃		893	W
	-Derate above 25℃		5.96	W/℃
Power Dissipation TO-247	PD TC=25℃		463	W
	-Derate above 25℃		3.08	W/℃
Operating and Storage Temperature	T _j ,T _{STG}		-55~+150	℃

Range			
Maximum Lead Temperature for Soldering Purposes	T_L	300	°C
Isolation voltage for terminal to case ($I_{ISOL} \leq 1mA, t=1s, DC$)	V_{ISO}	3000	V

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

Parameter	Symbol	Tests conditions	Min	Type	Max	Units
Off-Characteristics						
Drain-Source Voltage	BV_{DSS}	$I_D=250\mu A, V_{GS}=0V$	150	-	-	V
Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS} / \Delta T_J$	$I_D=250\mu A$, referenced to $25^{\circ}C$	-	0.16	-	V/°C
Drain cut-off current	I_{DSS}	$V_{DS}=70V, V_{GS}=0V$ $T_J=25^{\circ}C$	-	-	100	μA
		$V_{DS}=70V, T_J=125^{\circ}C$	-	-	2000	
Gate-body leakage current, forward	I_{GSSF}	$V_{DS}=0V, V_{GS}=30V$	-	-	500	nA
Gate-body leakage current, reverse	I_{GSSR}	$V_{DS}=0V, V_{GS}=-30V$	-	-	-500	nA
On-Characteristics						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2.5	3.5	4.5	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=20A$ (note 3)	-	3.8	4.5	mΩ
Forward Transconductance	g_{fs}	$V_{DS}=10V, I_D=60A$ (note 3)	-	220	-	S
Dynamic Characteristics						
Input capacitance	C_{iss}	$V_{DS}=25V,$ $V_{GS}=0V,$ $f=1.0MHz$	-	47	-	nF
Output capacitance	C_{oss}		-	2700	-	pF
Reverse transfer capacitance	C_{rss}		-	630	-	pF

Switching Characteristics						
Turn-On delay time	$t_{d(on)}$	$V_{DD}=35V, I_D=165A,$ $R_G=5\Omega,$ $V_{GS}=10V(\text{note 4,5})$	-	90	-	ns
Turn-On rise time	t_r		-	185	-	ns
Turn-Off delay time	$T_{d(off)}$		-	170	-	ns
Turn-Off Fall time	t_f		-	240	-	ns
Total Gate Charge	Q_g	$V_{DS}=50V,$ $I_D=165A,$	-	650	-	nC
Gate-Source charge	Q_{gs}		-	112	-	nC

Gate-Drain charge	Q_{gd}	$V_{GS}=10V$ (note4,5)	-	206	-	nC
Drain-Source Diode Characteristics and Maximum Ratings						
Drain-Source Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=1A$ (note 3)	-	0.67	1.2	V
Maximum Continuous Drain-Source Diode Forward Current	I_S		-	-	330	A
Maximum Pulsed Drain-Source Diode Forward Current	I_{SM}		-	-	1320	A
Reverse recovery time	t_{rr}	$V_{GS}=0V, I_F=50A$ $di_F/dt=100A/us$ (note 3)	-	95	-	ns
Reverse recovery charge	Q_{rr}		-	1.23	-	uC

Thermal Characteristics

Parameter	Symbol	Value		Unit
		SOT-227	TO-247	
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.14	0.27	°C/W
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	40	62.5	°C/W

Notes:

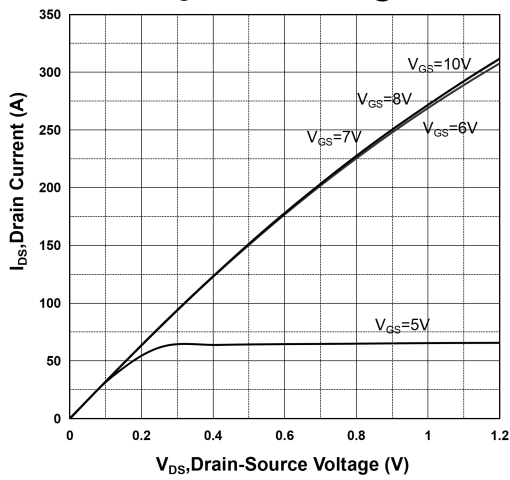
- 1: Pulse width limited by maximum junction temperature
- 2: $L=0.5mH, I_{AS}=100A, V_{DD}=50V, R_G=25\ \Omega$, Starting $T_J=25^\circ C$
- 3: $I_{SD} \leq 100A, di/dt \leq 300A/\mu s, V_{DD} \leq BV_{DSS}$, Starting $T_J=25^\circ C$
- 4: Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$
- 5: Essentially independent of operating temperature

Order information

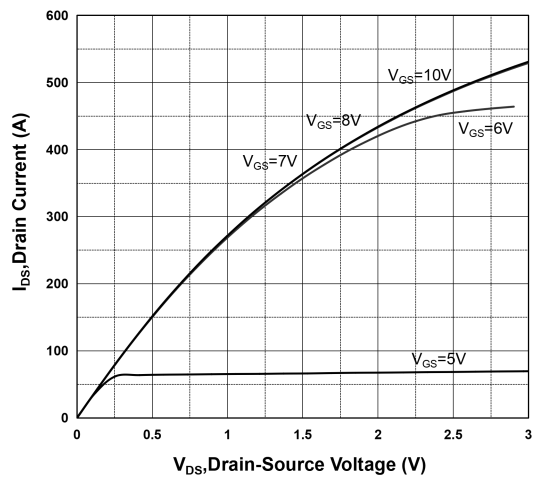
Marking	Package
MS330N15JDF4	SOT-227
MS330N15JDC0	TO-247

Electrical Characteristics

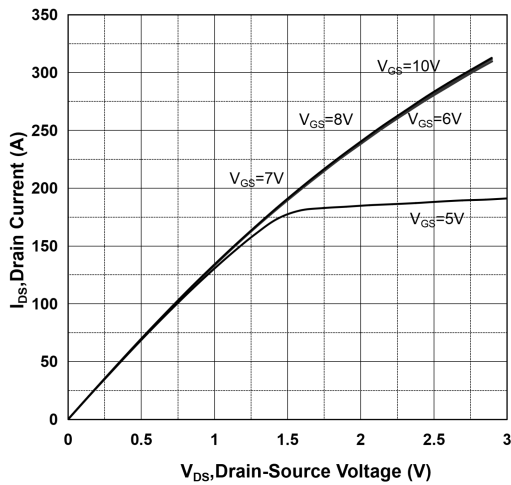
On-Region Characteristic@25°C



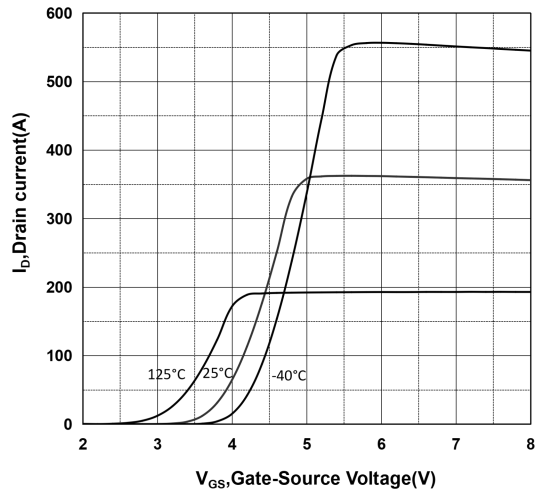
Extended On-Region Characteristic@25°C



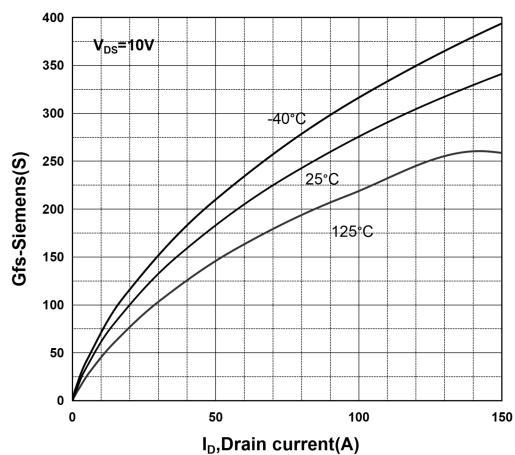
On-Region Characteristic@125°C



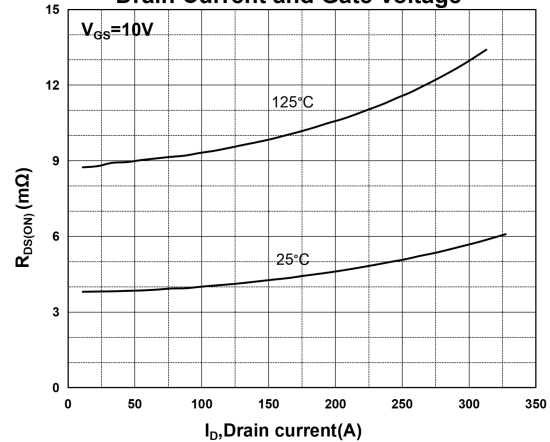
Transfer Characteristics

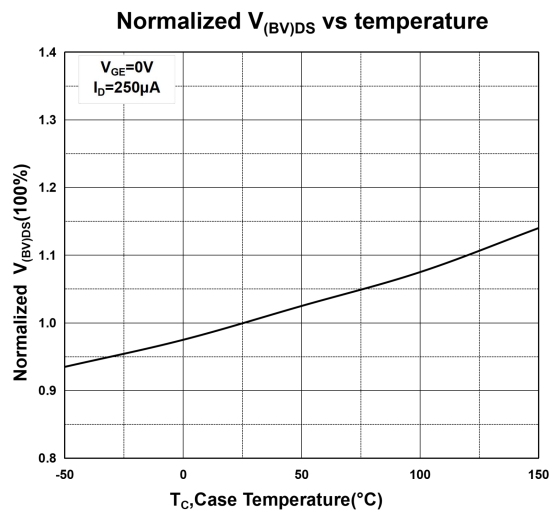
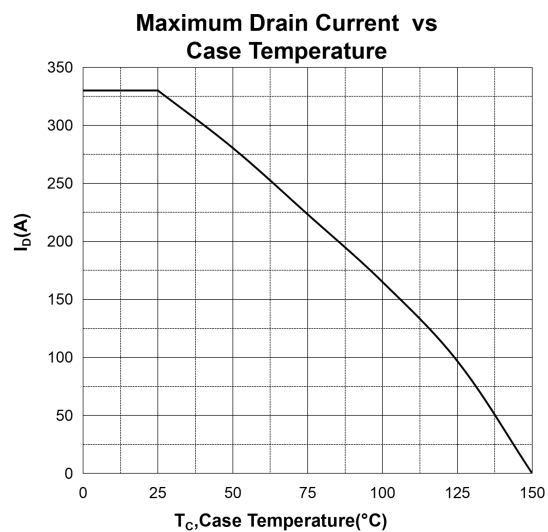
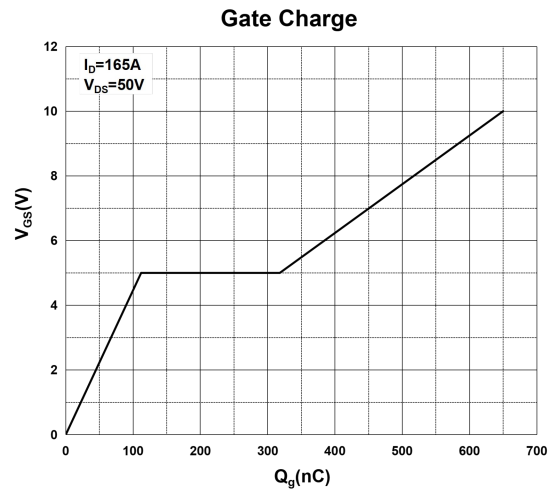
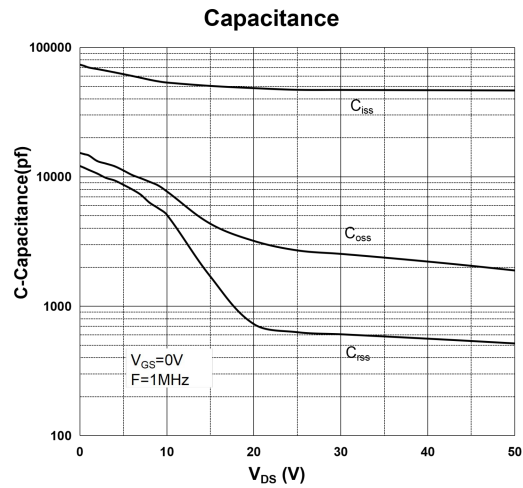
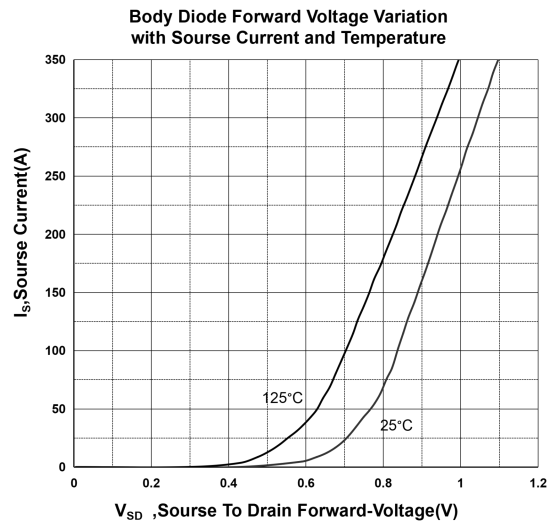
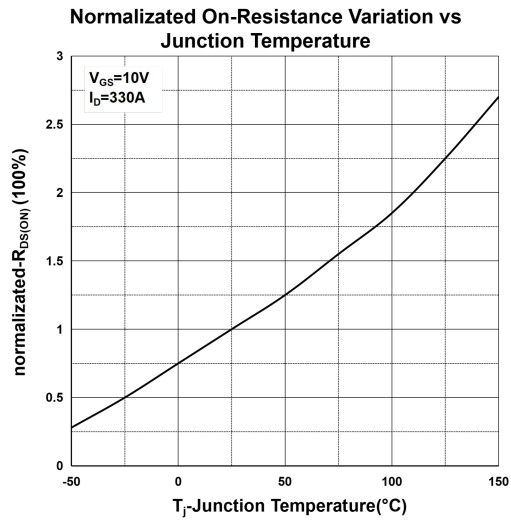


Transconductance

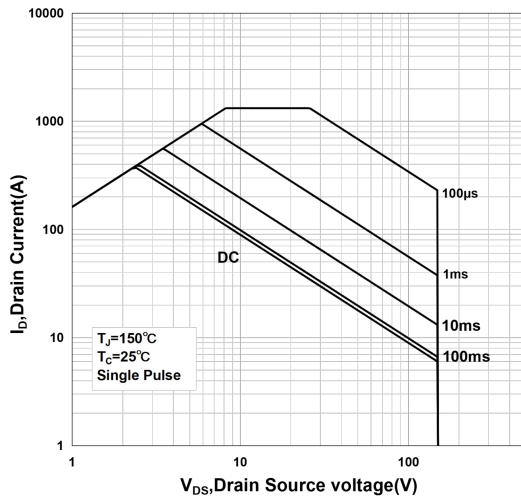


On-Resistance Variation vs Drain Current and Gate Voltage

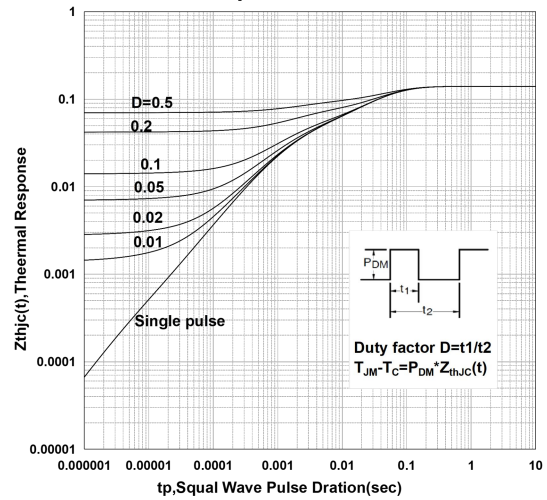




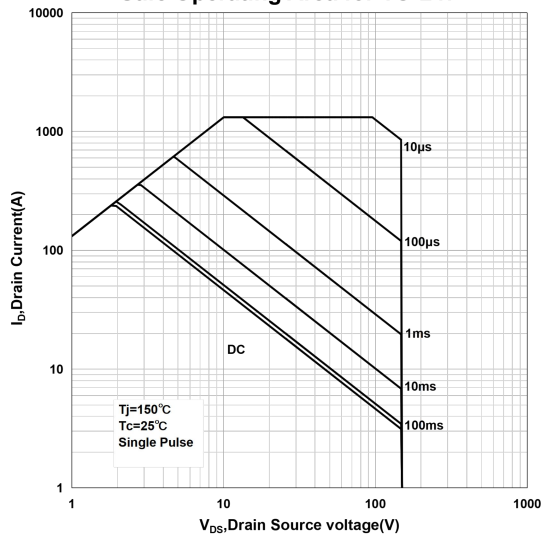
Safe Operating Area for SOT-227



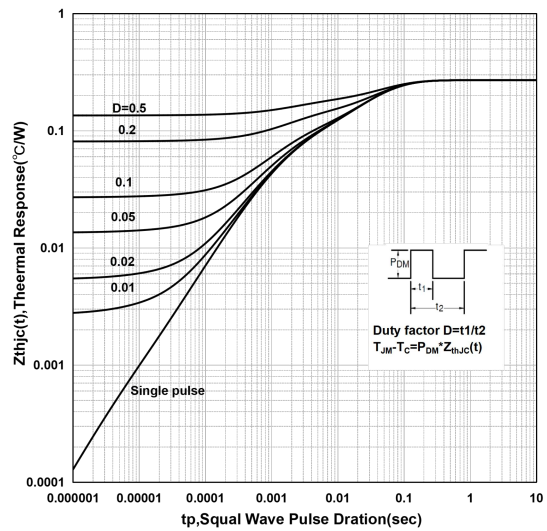
Transient response Curve for SOT-227



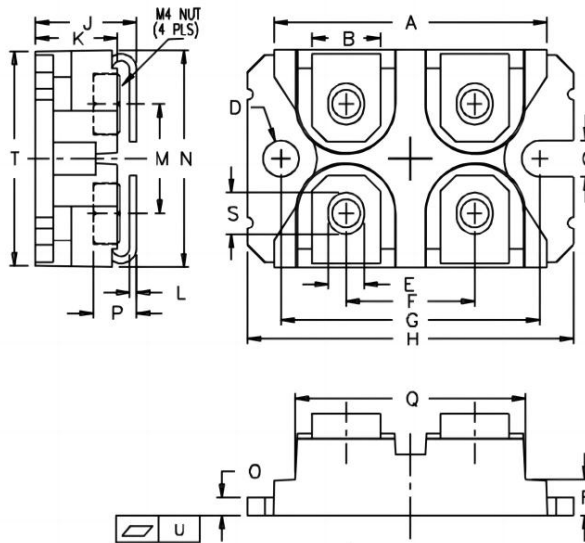
Safe Operating Area for TO-247



Transient Response Curve for TO-247



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

