远勋
YUANXUN

V_{DS}	=	3300V
$R_{DS(on)}$	=	50mΩ
$I_D @ 25℃$	=	63A

Features

- High Blocking Voltage with LowOn-Resistance
- High Speed Switching with LowCapacitance
- Easy to Parallel and Simple toDrive

Benefits

- Higher System Efficiency
- Reduced CoolingRequirements
- Increased PowerDensity
- Increased System SwitchingFrequency

Applications

- PowerSupplies
- High Voltage DC/DCConverters
- MotorDrives
- Switch Mode PowerSupplies
- Pulsed Powerapplications

Package

S1: Driver Source
S2: Power Source
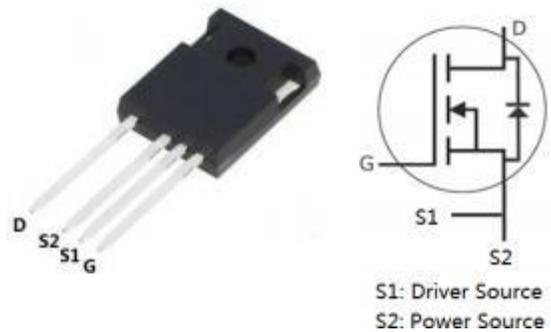
Part Number	Package
YX330R050	TO-247-4

Maximum Ratings (T$_C$=25℃ unless otherwise specified)

Symbol	Parameter	Value	Unit	Test Conditions	Note
V_{DSmax}	Drain-Source Voltage	3300	V	V_{GS}=0V, I_D=100μA	
V_{GSmax}	Gate-Source Voltage	-10/+25	V	Absolute maximum values	
V_{GSop}	Gate-Source Voltage	-5/+20	V	Recommended operational values	
I_D	Continuous Drain Current	63	A	V_{GS}=20V, T$_c$=25℃	
		44		V_{GS}=20V, T$_c$=100℃	
$I_{D(pulse)}$	Pulsed Drain Current	235	A	Pulse width t$_p$ limited by T$_{Jmax}$	
P_D	Power Dissipation	536	W	Tc=25℃,	
T$_J$, T$_{STG}$	Operating Junction and Storage Temperature	-55 to +175	℃		

Electrical Characteristics (T_C=25℃ unless otherwise specified)

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions	Note
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	3300	/	/	V	V_{GS}=0V, I_D=100μA	
$V_{GS(th)}$	Gate Threshold Voltage	2.5	3.5	/	V	V_{DS}=V_{GS}, I_D=10mA	Fig. 9
		/	2.4	/		V_{DS}=V_{GS}, I_D=10mA, T_J=175℃	
I_{DSS}	Zero Gate Voltage Drain Current	/	1		μA	V_{DS}=3300V, V_{GS}=0V	
I_{GSS+}	Gate-Source Leakage Current	/	10	100	nA	V_{DS}=0V, V_{GS}=25V	
I_{GSS-}	Gate-Source Leakage Current	/	10	100	nA	V_{DS}=0V, V_{GS}=-10V	
$R_{DS(on)}$	Drain-Source On-State Resistance	/	50	65	mΩ	V_{GS}=20V, I_D=40A	Fig.5-8
		/	105	/		V_{GS}=20V, I_D=40A, T_J=175℃	
g_{fs}	Transconductance	/	15.3	/		V_{DS}=10V, I_D=40A	Fig.4
		/	16.4	/		V_{DS}=10V, I_D=40A, T_J=175℃	
C_{iss}	Input Capacitance	/	7301	/	pF	V_{GS}=0V	Fig.11
C_{oss}	Output Capacitance	/	130	/		V_{DS}=1000V	
C_{rss}	Reverse Transfer Capacitance	/	12.3	/		f=1MHz	
E_{oss}	C_{oss} Stored Energy	/	84	/	μJ	V_{AC}=25mV	Fig.12
E_{ON}	Turn-On Switching Energy	/	1222	/	μJ	V_{DS}=1700V, V_{GS}=-5V/20V	Fig.22,26
E_{OFF}	Turn-Off Switching Energy	/	533	/		I_D=50A, R_g=3Ω, L=60μH	
$t_{d(on)}$	Turn-On Delay Time	/	74	/	ns	V_{DS}=1700V, V_{GS}=-5V/20V, I_D=50A R_g=3Ω, L=60μH	Fig.22
t_r	Rise Time	/	37	/			
$t_{d(off)}$	Turn-Off Delay Time	/	32	/			
t_f	Fall Time	/	18	/			
$R_{G(int)}$	Internal Gate Resistance	/	1.2	/	Ω	f=1MHz, V_{AC}=25mV	
Q_{GS}	Gate to Source Charge	/	120	/	nC	V_{DS}=1000V	Fig.10
Q_{GD}	Gate to Drain Charge	/	100	/		V_{GS}=-5V/20V	
Q_G	Total Gate Charge	/	340	/		I_D=40A	

Reverse Diode Characteristics

Symbol	Parameter	Typ.	Max.	Unit	Test Conditions	Note
V_{SD}	Diode Forward Voltage	4.1	/	V	V_{GS}=-5V, I_F=20A	Fig. 17-18
		3.5	/		V_{GS}=-5V, I_F=20A, T_J=175℃	
I_S	Continuous Diode Forward Current	/	63	A	T_C=25℃	
t_{rr}	Reverse Recover Time	154	/	ns	V_R=1700V, I_{SD}=50A T_J=25℃	
Q_{rr}	Reverse Recovery Charge	740	/	nC		
I_{rrm}	Peak Reverse Recovery Current	17	/	A		

Reverse Diode Characteristics

Symbol	Parameter	Typ.	Max.	Unit	Test Conditions	Note
$R_{θJC}$	Thermal Resistance	0.21	0.28	℃/W		Fig.10

Figure1:OutputCharacteristics(T_J=25℃)

V_{GS} = 20 V
V_{GS} = 18 V
V_{GS} = 16 V
V_{GS} = 14 V
V_{GS} = 12 V
V_{GS} = 0 V

Drain-Source Current, I_{DS} (A)

Drain-Source Voltage, V_{DS} (V)
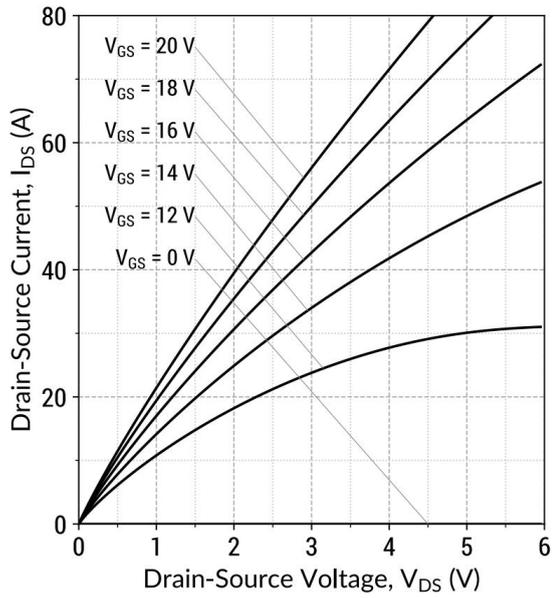
Figure 2: Output Characteristics (T_J=175℃)

V_{GS} = 20 V
V_{GS} = 18 V
V_{GS} = 16 V
V_{GS} = 14 V
V_{GS} = 12 V
V_{GS} = 0 V

Drain-Source Current, I_{DS} (A)

Drain-Source Voltage, V_{DS} (V)
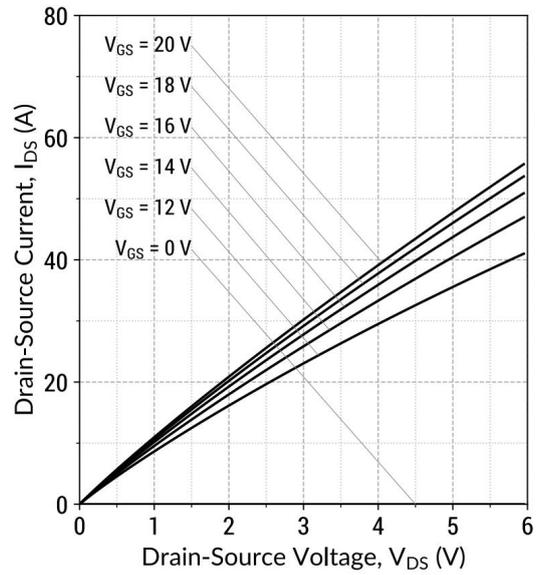
Figure3:OutputCharacteristics(Vgs=20V)

T_j = 175°C
T_j = 150°C
T_j = 125°C
T_j = 75°C
T_j = 25°C

Drain-Source Current, I_{DS} (A)

Drain-Source Voltage, V_{DS} (V)
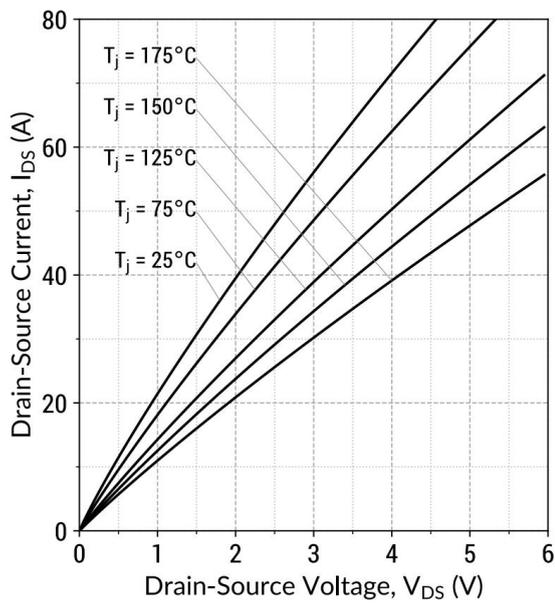
Figure4:TransferCharacteristics(Vds=10V)

T_j = 175°C
T_j = 25°C

Drain-Source Current, I_{DS} (A)

Gate-Source Voltage, V_{GS} (V)
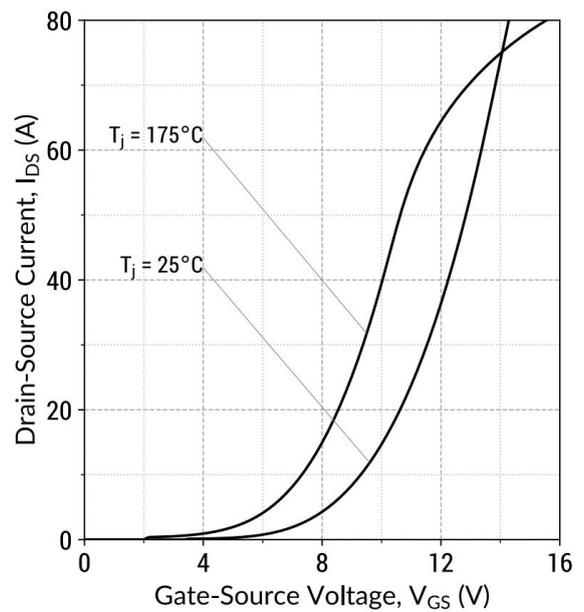
Figure5:On-StateResistancev/sTemperature
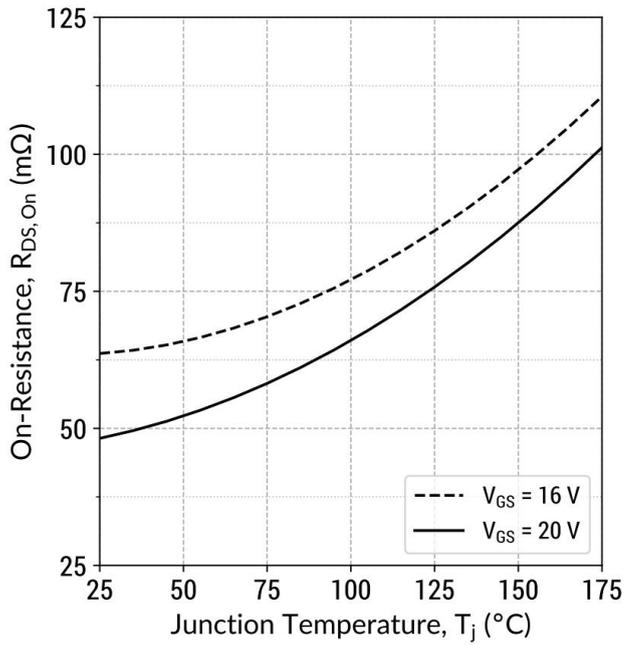
Figure6:On-StateResistancev/sDrainCurrent
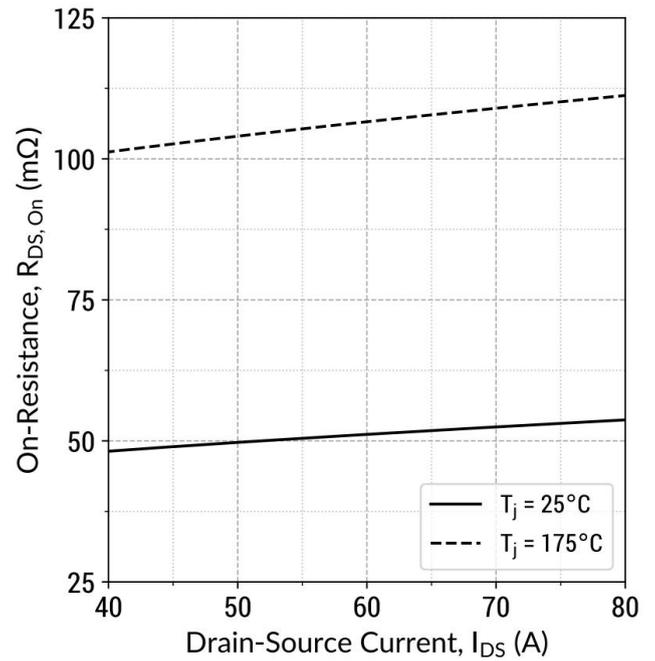
Figure7:NormalizedOn-StateResistancev/sTemperature
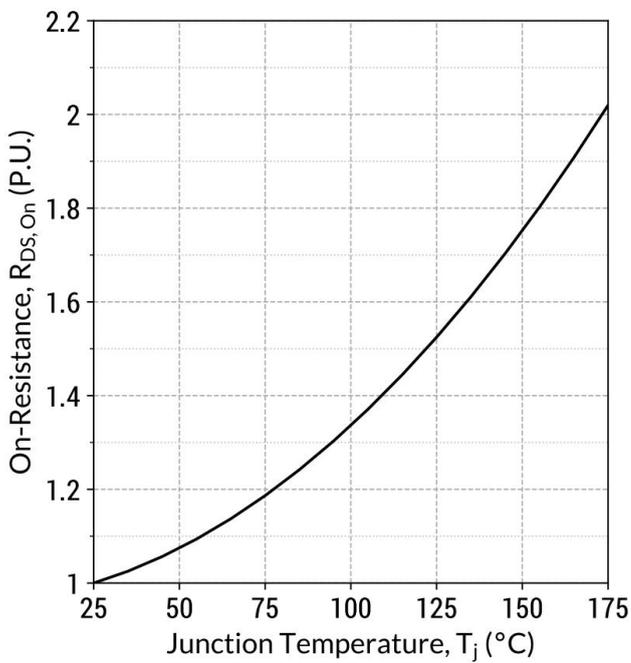
Figure8:On-StateResistancev/sGateVoltage
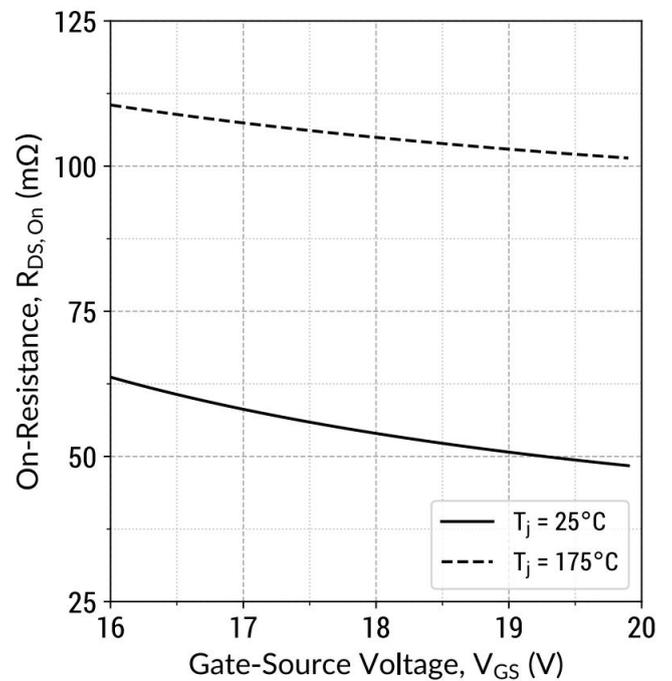
Figure9:ThresholdVoltageCharacteristics
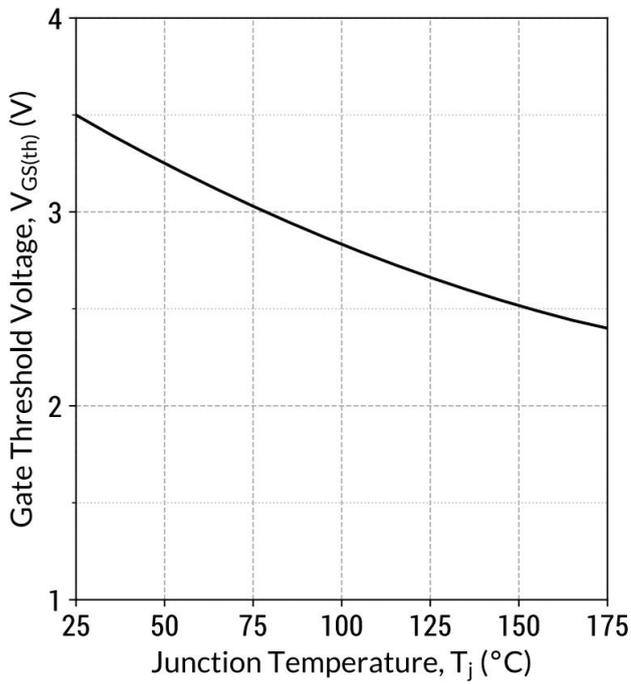
Figure10:GateChargeCharacteristics
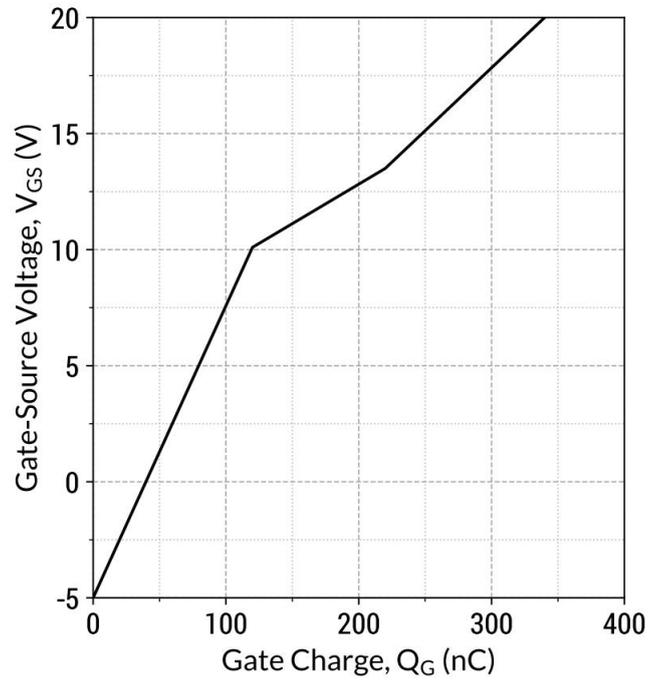
Figure11:Capacitancev/sDrain-SourceVoltage
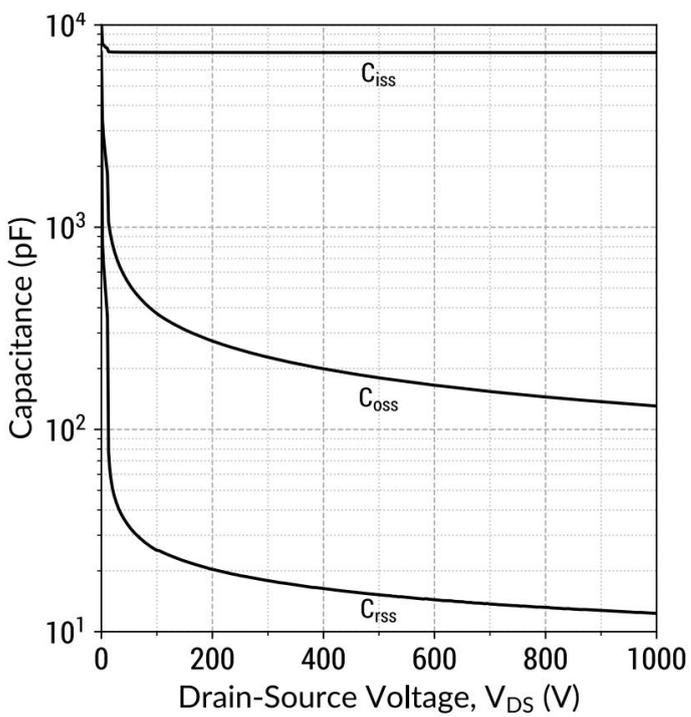
Figure12:OutputCapacitorStoredEnergy
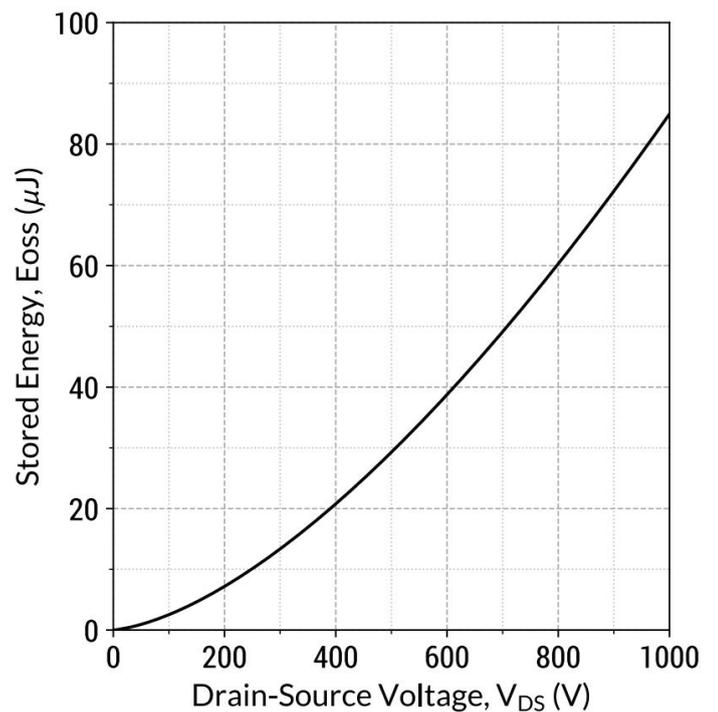
Figure13:TransientThermalImpedance
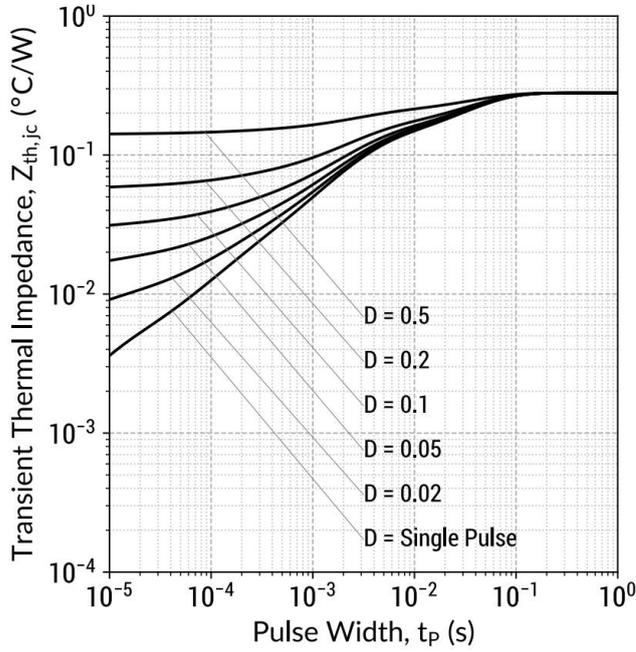
Figure14:SafeOperatingArea(T_J=25℃)
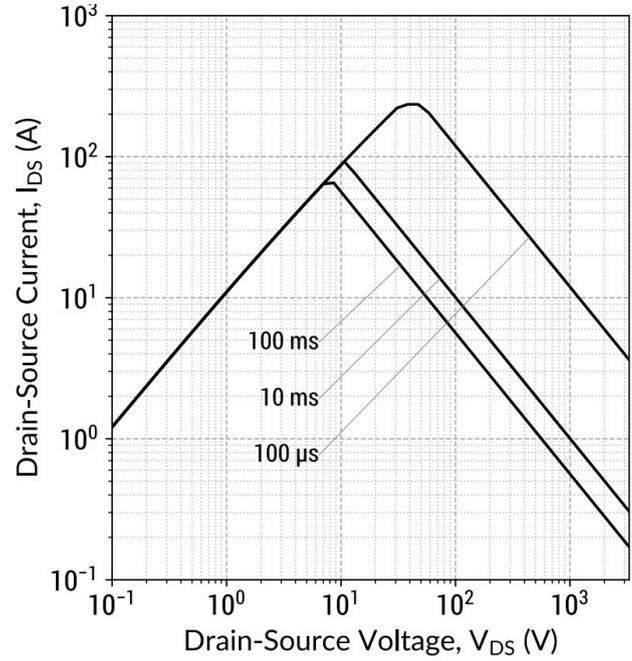
Figure15:CurrentDe-ratingCurve
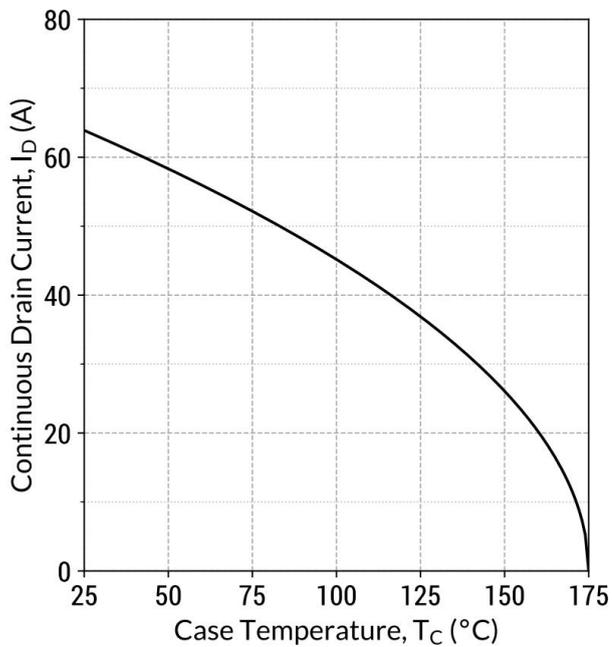
Figure16:PowerDe-ratingCurve
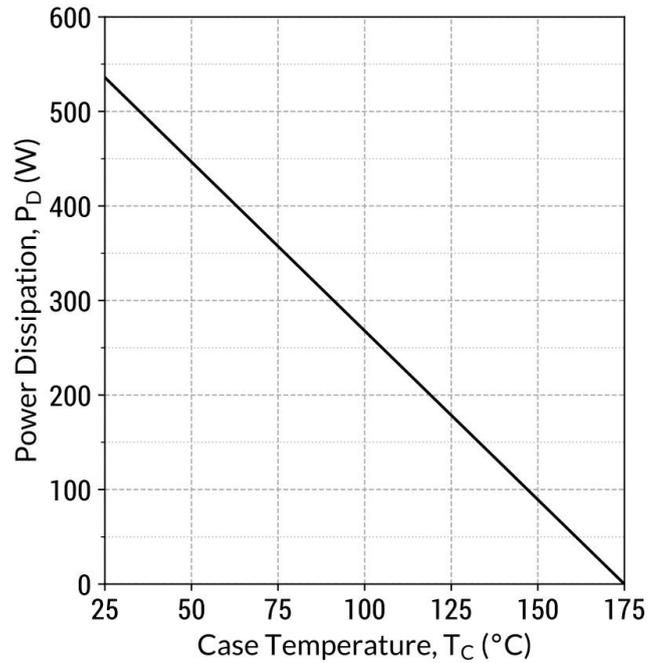
Figure17:BodyDiodeCharacteristics(**T_J=25**℃)
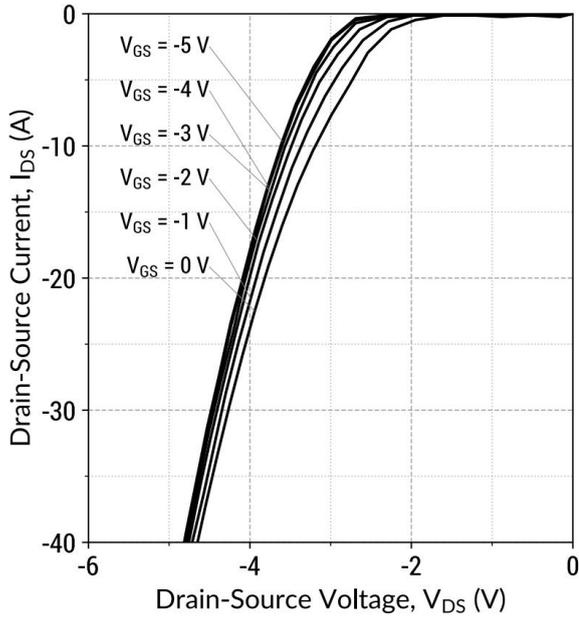
Figure18:BodyDiodeCharacteristics(**T_J=175**℃)
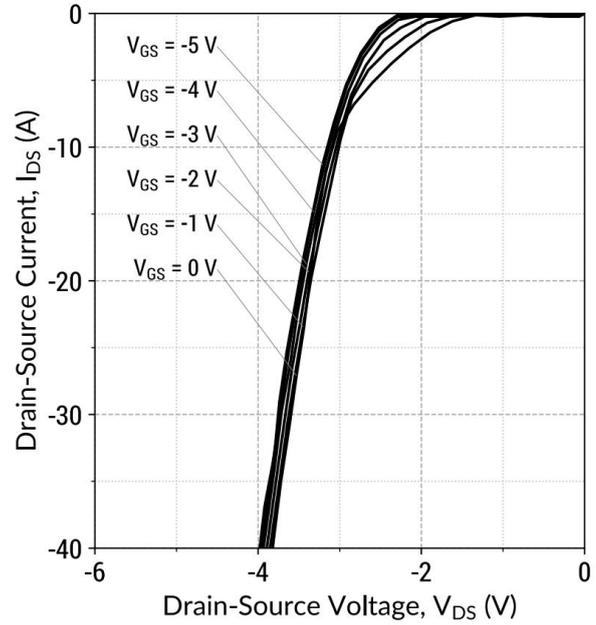
Figure19:ThirdQuadrantCharacteristics(**T_J=25**℃)
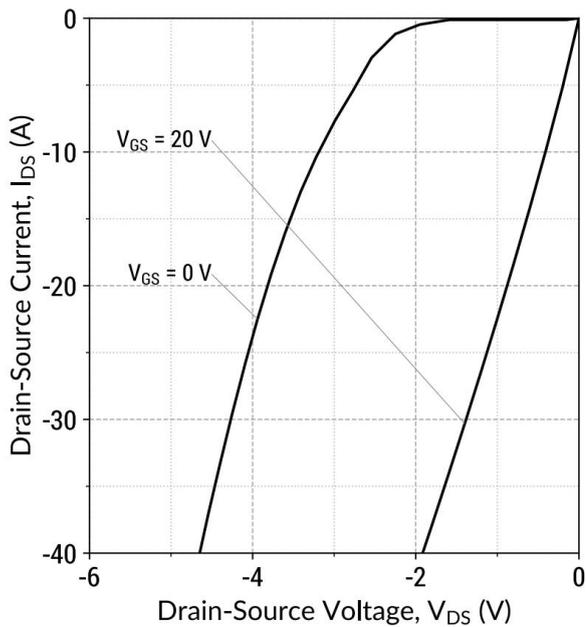
Figure20:ThirdQuadrantCharacteristics(**T_J=175**℃)
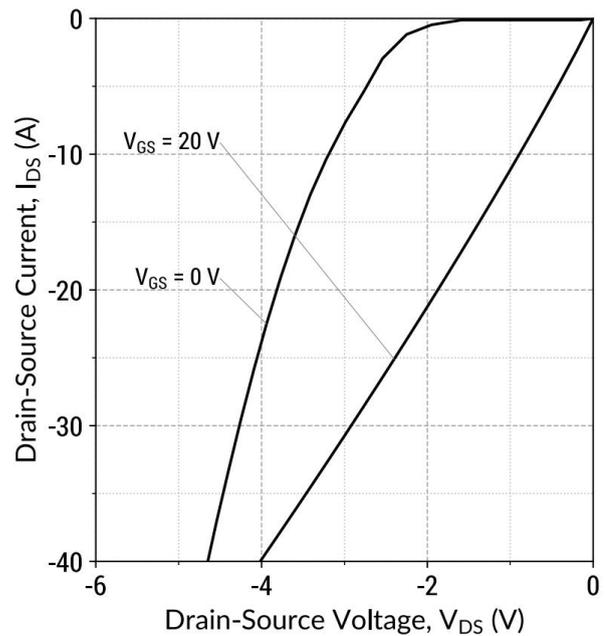
Figure21:InductiveSwitchingEnergyv/sDrainCurrent（Vds=1500V）
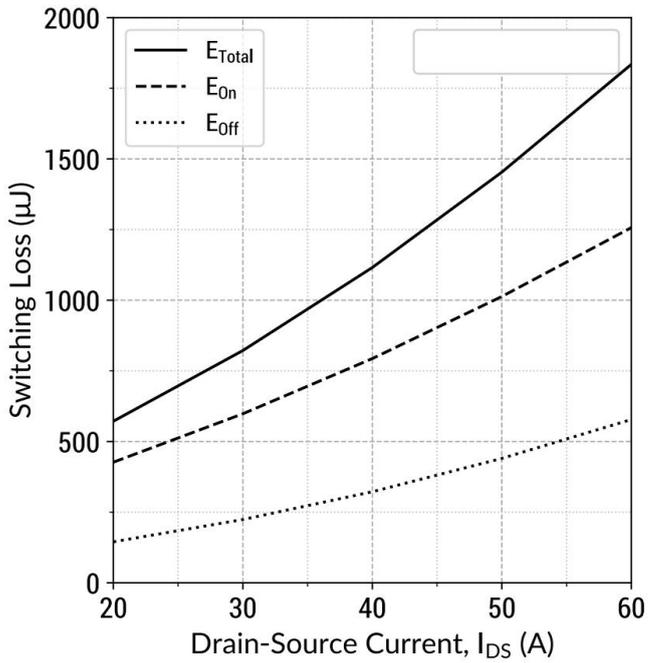

Figure21:InductiveSwitchingEnergyv/sDrainCurrent（Vds=1700V）
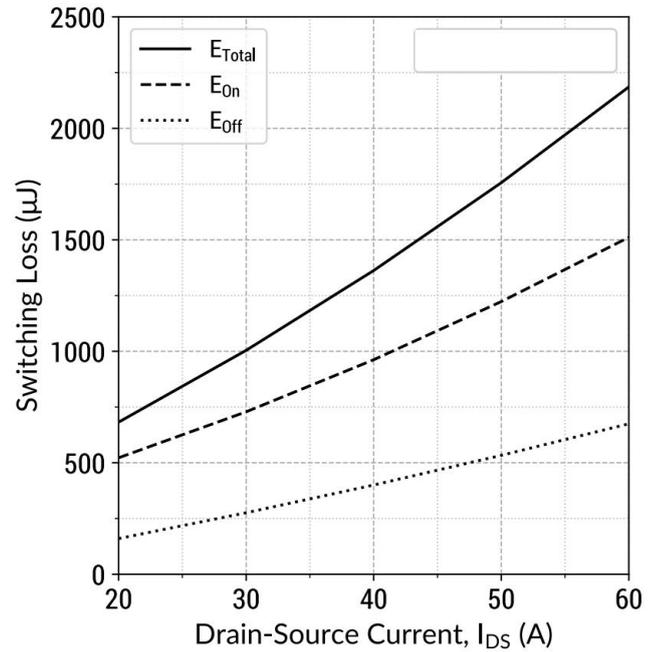

Figure23:InductiveSwitchingEnergyv/sRg（Vds=1700V)
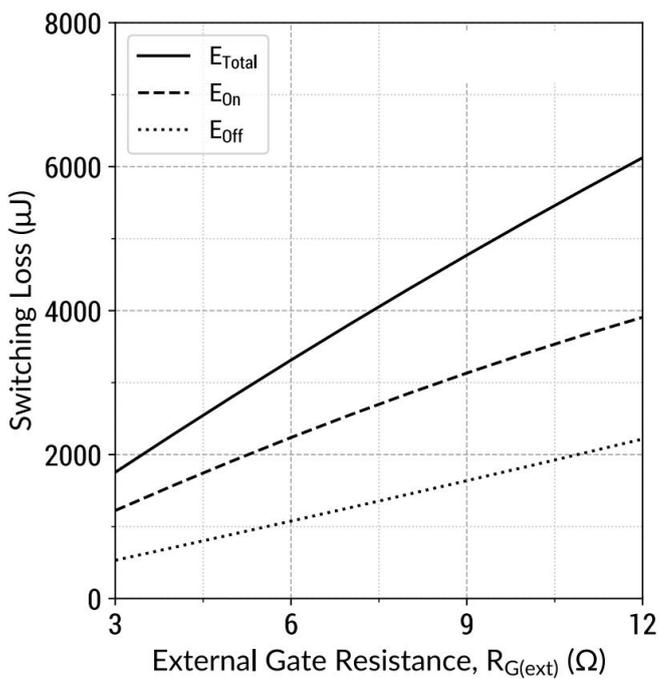
Figure24:SwitchingTimev/sRg（Vds=1700V)
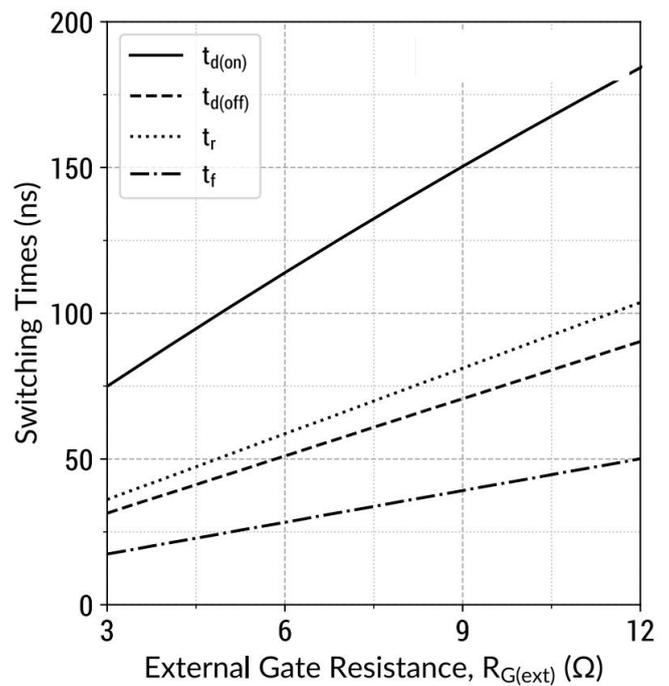
Figure25:InductiveSwitchingEnergyv/sTemperature
（Vds=1700V)
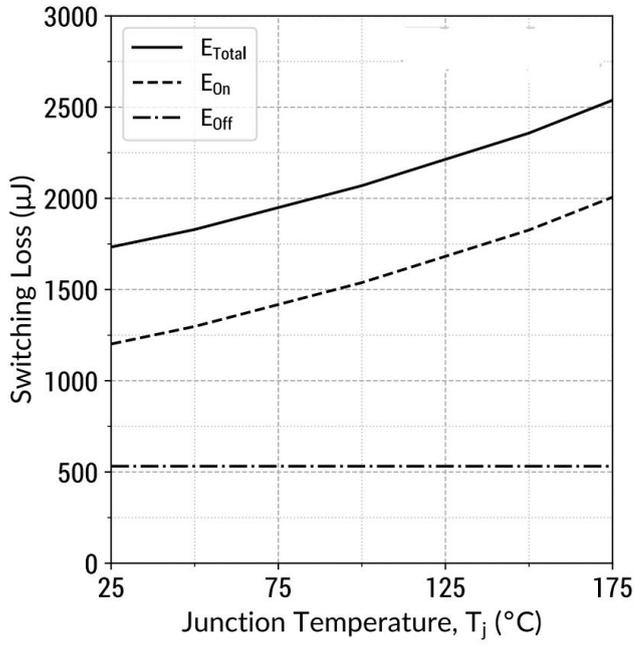
Figure26:dV/dtv/sRg （Vds=1700V)
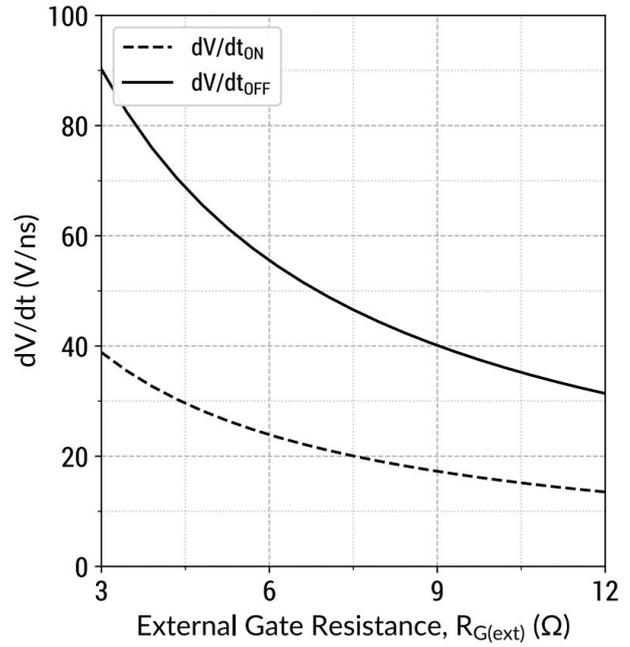
Figure27:HighCurrentIV
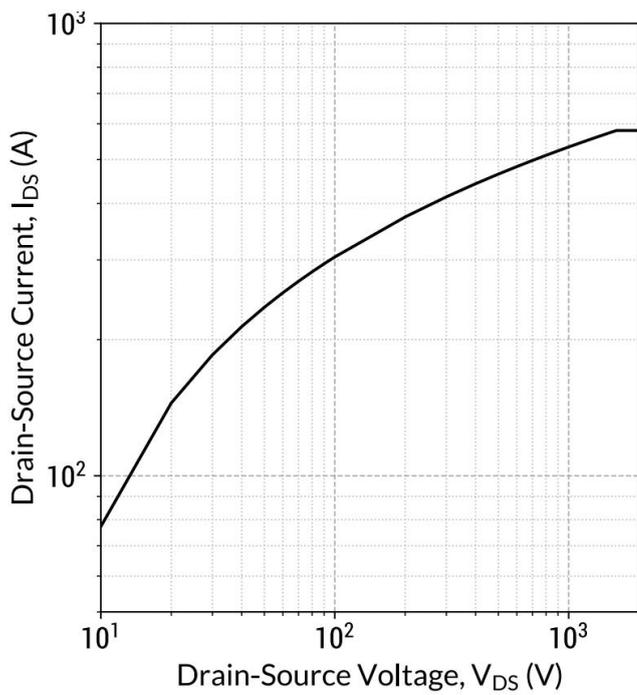
Package Dimensions

Package TO-247-4
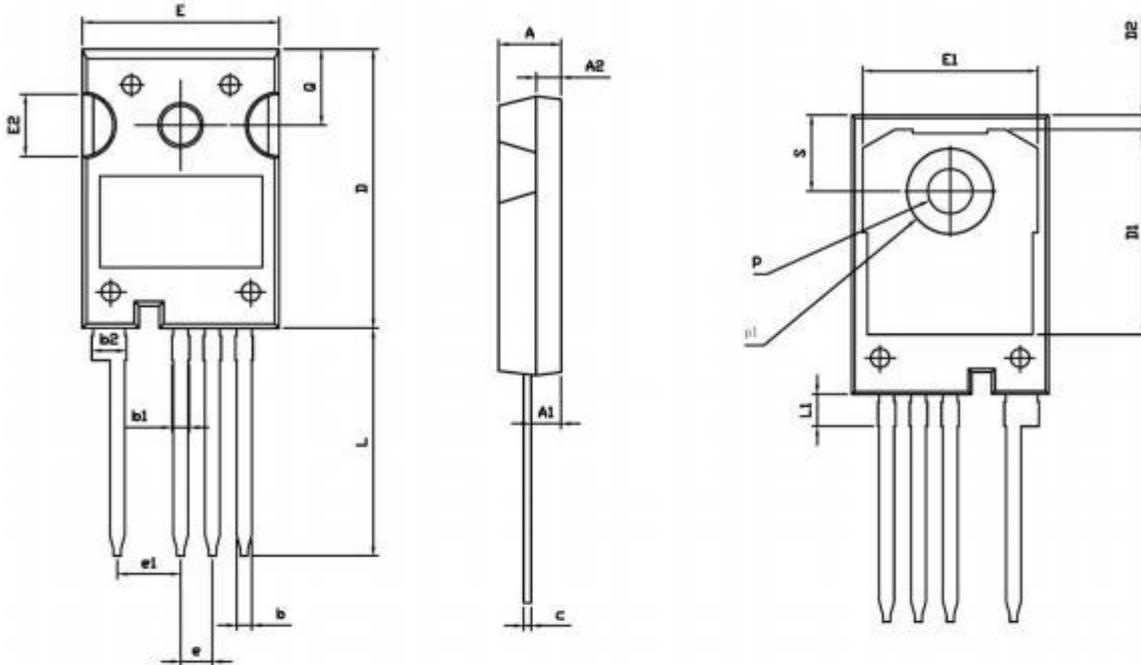
RECOMMENDED LAND PATTERN
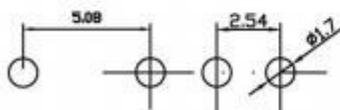
UNIT: mm

	MIN	NOM	MAX
A	4.80	5.00	5.20
A1	2.25	2.40	2.45
A2	1.85	2.00	2.15
b	1.05	1.20	1.35
b1	1.00	1.30	1.60
b2	2.35	2.65	2.95
c	0.50	0.60	0.70
D	22.34	22.54	22.74
D1	16.00	16.50	17.00
D2	0.97	1.17	1.37
e	2.34	2.54	2.74
e1	4.88	5.08	5.28
E	15.60	15.80	16.00
E1	13.50	14.00	14.50
E2	4.80	5.00	5.20
L	18.08	18.38	18.68
L1	2.38	2.58	2.78
p	3.50	3.60	3.70
p1	6.60	6.80	7.00
Q	6.00	6.15	6.30
S	6.00	6.15	6.30