

## MOSFET Silicon N-Channel MOS



### 1. Applications

Synchronous rectification in SMPS,  
Hard switching and High speed circuit  
DC/DC in telecoms and industrial

### 2. Features

Low drain-source on-resistance:  
TOLL-8L RDS(on) = 1.2mΩ (typ.)  
High speed power switching  
Enhanced body diode dv/dt capability  
Enhanced avalanche ruggedness

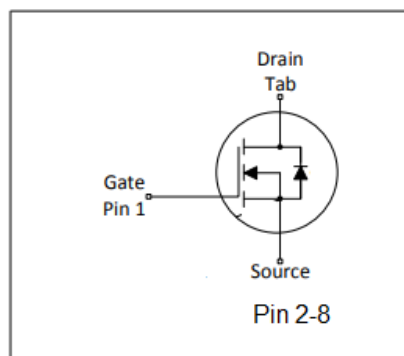
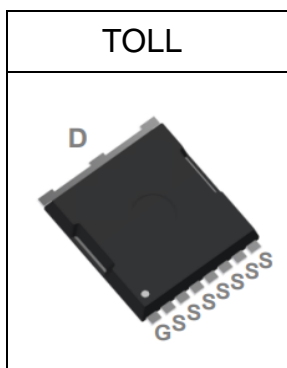


**Table 1 Key Performance Parameters**

Parameter	Value	Unit
$V_{DS} @ T_{j,max}$	100	V
$R_{DS(on),max}$	1.4	mΩ
$Q_{g,typ}$	231	nC
$I_{D,pulse}$	987	A

### 3. Packaging and Internal Circuit

Part Name	Package	Marking
AUR014N10	TOLL	AUR014N10



# 1 Maximum ratings

At  $T_j = 25^\circ\text{C}$ , unless otherwise specified

**Table 2 Maximum ratings**

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Continuous drain current at sikicon <sup>1)</sup>	$I_D$		-	395	A	$T_C = 25^\circ\text{C}$
Continuous drain current at package <sup>1)</sup>	$I_D$		-	316	A	$T_C = 25^\circ\text{C}$
Continuous drain current at silicon <sup>1)</sup>	$I_D$			250	A	$T_C = 100^\circ\text{C}$
Pulsed drain current <sup>2)</sup>	$I_{D,pulse}$	-		987	A	$T_C = 25^\circ\text{C}$
Avalanche energy, single pulse	$E_{AS}$	-	-	1250	mJ	$T_C = 25^\circ\text{C}$ , $V_{DD} = 50\text{V}$ , $V_{gs} = 10\text{V}$ , $L = 1\text{mH}$ , $R_G = 25\Omega$
Avalanche current, single pulse	$I_{AR}$	-	-	50	A	$T_C = 25^\circ\text{C}$ , $V_{DD} = 50\text{V}$ , $L = 1\text{mH}$ , $R_G = 25\Omega$
Gate source voltage (static)	$V_{GS}$	-20	-	20	V	static;
Power dissipation	$P_{tot}$	-	-	313	W	$T_C = 25^\circ\text{C}$
Storage temperature	$T_{stg}$	-55	-	150	$^\circ\text{C}$	
Operating junction temperature	$T_j$	-55	-	150	$^\circ\text{C}$	
Soldering Temperature Distance of 1.6mm from case for 10s	$T_L$			260	$^\circ\text{C}$	

<sup>1)</sup>Limited by  $T_{j,max}$ . Maximum Duty Cycle  $D = 0.50$

<sup>2)</sup>Pulse width  $t_p$  limited by  $T_{j,max}$

<sup>3)</sup>Identical low side and high side switch with identical  $R_G$

## 2 Thermal characteristics

**Table Thermal characteristics**

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Thermal resistance, junction - case	$R_{thJC}$	-	-	0.4	°C/W	-
Thermal resistance, junction - ambient	$R_{thJA}$	-	-	40	°C/W	device on PCB, minimal footprint

### 3 Electrical characteristics

At  $T_j=25^\circ\text{C}$ , unless otherwise specified

**Table 4 Static characteristics**

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Drain-source breakdown voltage	$V_{(BR)DSS}$	100	-	-	V	$V_{GS}=0V, I_D=250\mu A$
Gate threshold voltage	$V_{(GS)th}$	2		4	V	$V_{DS}=V_{GS}, I_D=250\mu A$
Zero gate voltage drain current	$I_{DSS}$	-	-	1	$\mu A$	$V_{DS}=80V, V_{GS}=0V, T_j=25^\circ C$
Gate-source leakage current	$I_{GSS}$	-	-	+/-100	nA	$V_{GS}=\pm 20V, V_{DS}=0V$
Drain-source on-state resistance	$R_{DS(on)}$	-	-	1.4	m $\Omega$	$V_{GS}=10V, I_D=30A, T_j=25^\circ C$
Gate resistance (Intrinsic)	$R_G$	-	0.7	-	$\Omega$	$f=1MHz, \text{open drain}$
Transconductance	$G_{fs}$		108		S	$V_{DS}=5V, I_D=50A$

**Table 5 Dynamic characteristics**

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Input capacitance	$C_{iss}$	-	13000	-	PF	$V_{GS}=0V, V_{DS}=50V, f=1MHz$
Output capacitance	$C_{oss}$	-	2147	-	PF	$V_{GS}=0V, V_{DS}=50V, f=1MHz$
Reverse transfer capacitance	$C_{riss}$	-	398	-	PF	$V_{GS}=0V, V_{DS}=50V, f=1MHz$
Turn-on delay time	$t_{d(on)}$	-	27.7	-	ns	$V_{DD}=50V, V_{GS}=10V, I_D=1A, R_G=1\Omega$
Rise time	$t_r$	-	21.5	-	ns	$V_{DD}=50V, V_{GS}=10V, I_D=1A, R_G=1\Omega$
Turn-off delay time	$t_{d(off)}$	-	89.6	-	ns	$V_{DD}=50V, V_{GS}=10V, I_D=1A, R_G=1\Omega$
Fall time	$t_f$	-	96.8	-	ns	$V_{DD}=50V, V_{GS}=10V, I_D=1A, R_G=1\Omega$

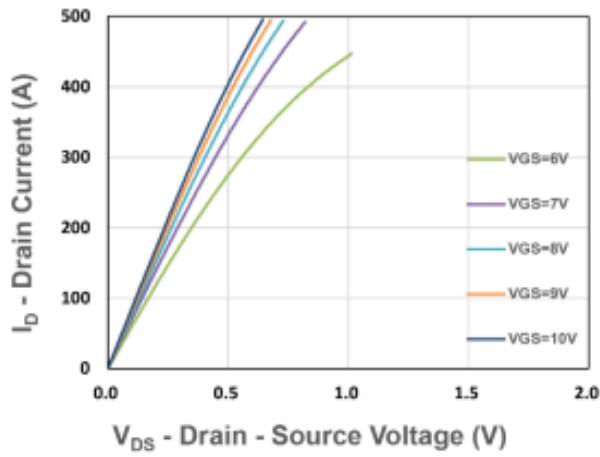
**Table 6 Gate charge characteristics**

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Gate to source charge	$Q_{gs}$	-	70.2	-	nC	$V_{DD}=50V, I_D=100A, V_{GS}=10V$
Gate to drain charge	$Q_{gd}$	-	65.7	-	nC	$V_{DD}=50V, I_D=100A, V_{GS}=10V$
Gate charge total	$Q_g$	-	231	-	nC	$V_{DD}=50V, I_D=100A, V_{GS}=10V$

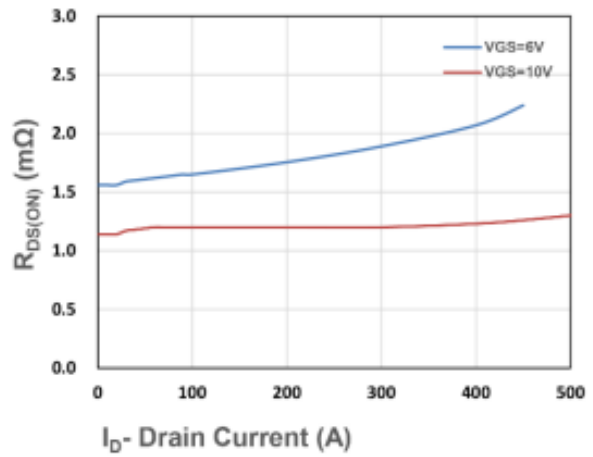
**Table 7 Reverse diode characteristics**

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Continuous Source Current at silicon	$I_{SD}$	-	-	395	A	<i>Maximum Ratings</i>
Diode forward voltage	$V_{SD}$	-	0.75	1.1	V	$V_{GS}=0V, I_s=30A, T_j=25^{\circ}C$
Reverse recovery time	$t_{rr}$	-	120	-	ns	$V_{GS}=0V, I_F=30A, di_F/dt=100A/\mu s$
Reverse recovery charge	$Q_{rr}$	-	400	-	nC	$V_{GS}=0V, I_F=30A, di_F/dt=100A/\mu s$

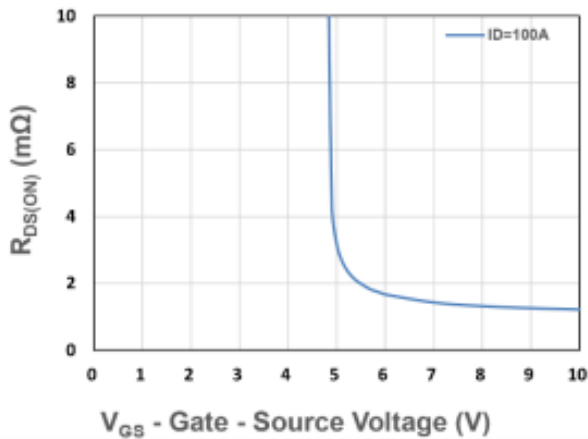
## 4 Electrical characteristics diagram



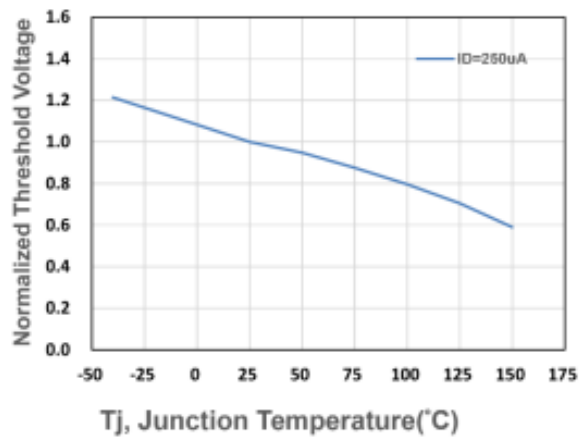
$V_{DS}$  - Drain - Source Voltage (V)  
Figure 1. Output Characteristics



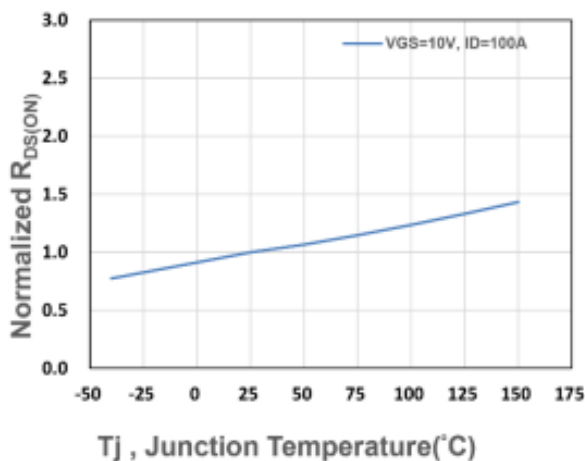
$I_D$  - Drain Current (A)  
Figure 2. On-Resistance vs.  $I_D$



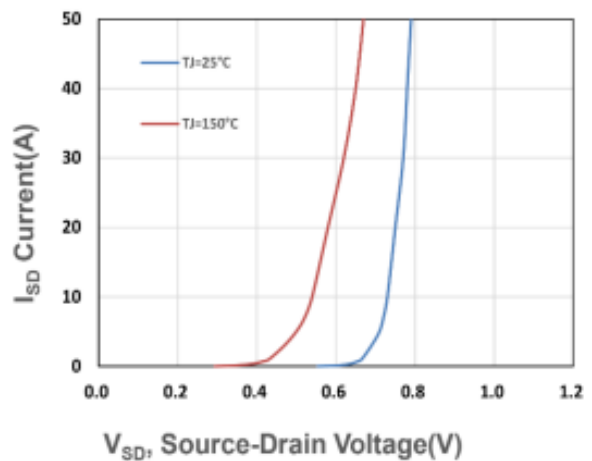
$V_{GS}$  - Gate - Source Voltage (V)  
Figure 3. On-Resistance vs.  $V_{GS}$



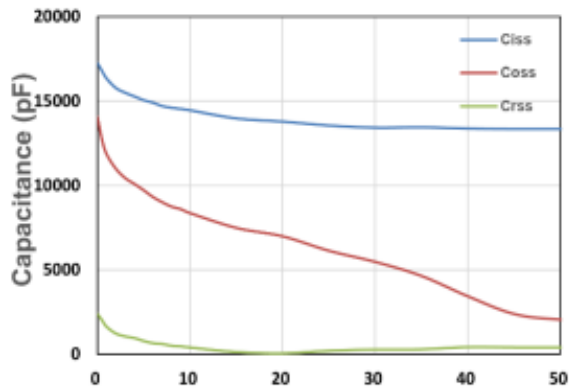
$T_J$ , Junction Temperature( $^{\circ}C$ )  
Figure 4. Gate Threshold Voltage



$T_J$ , Junction Temperature( $^{\circ}C$ )  
Figure 5. Drain-Source On Resistance

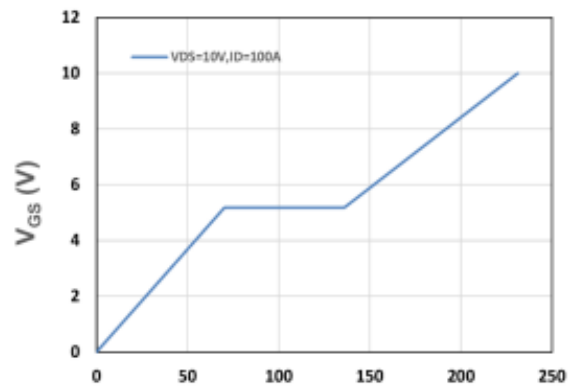


$V_{SD}$ , Source-Drain Voltage(V)  
Figure 6. Source-Drain Diode Forward



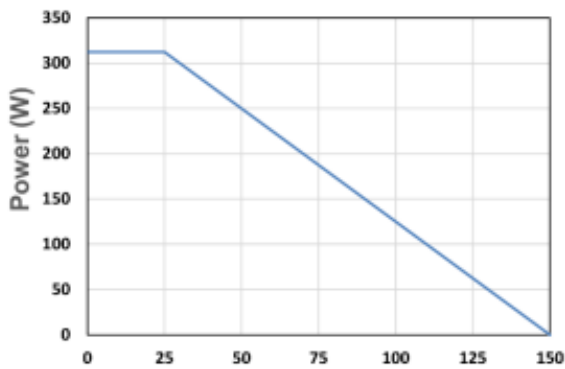
$V_{DS}$  - Drain - Source Voltage (V)

Figure 7. Capacitance



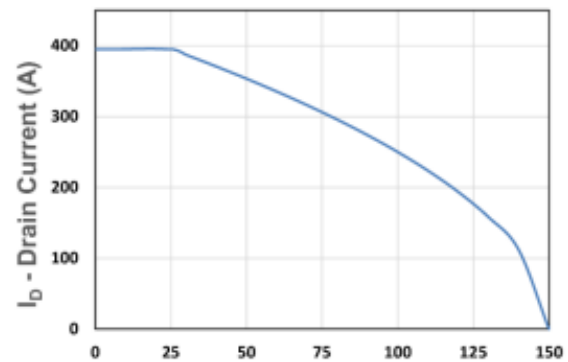
$Q_g$ , Total Gate Charge (nC)

Figure 8. Gate Charge Characteristics



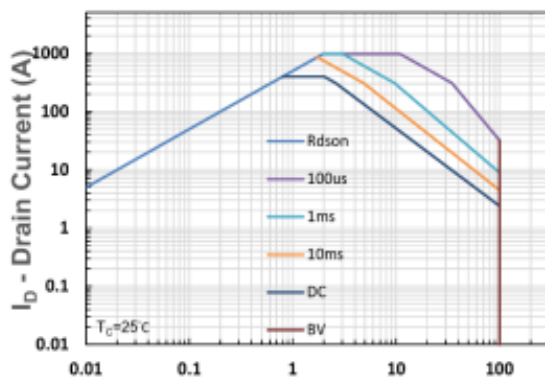
$T_c$  - Case Temperature ( $^{\circ}C$ )

Figure 9. Power Dissipation



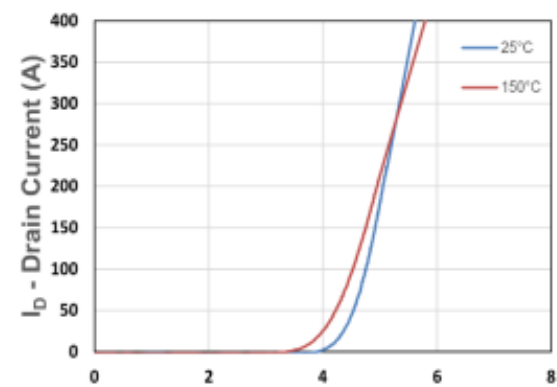
$T_c$  - Case Temperature ( $^{\circ}C$ )

Figure 10. Drain Current



$V_{DS}$  - Drain-Source Voltage (V)

Figure 11. Safe Operating Area



$V_{GS}$  - Gate - Source Voltage (V)

Figure 12. Transfer Characteristics

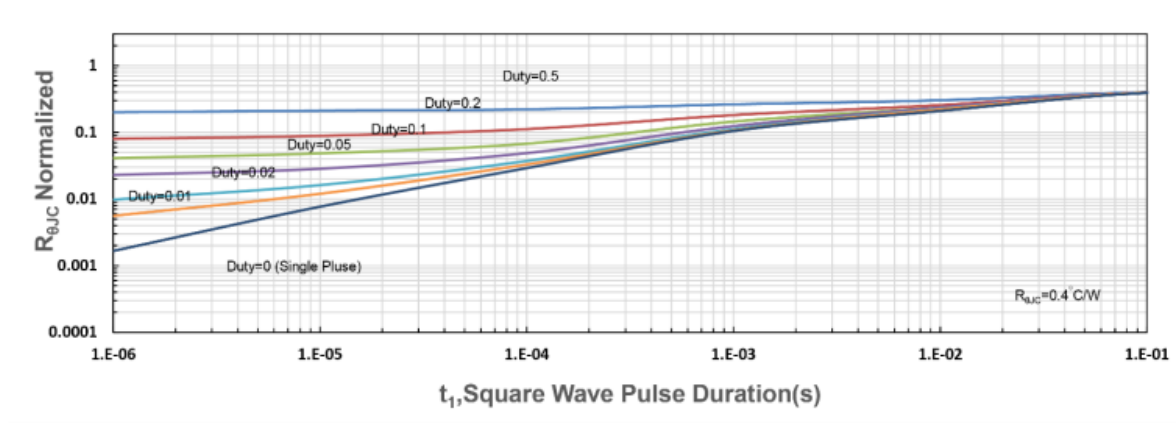
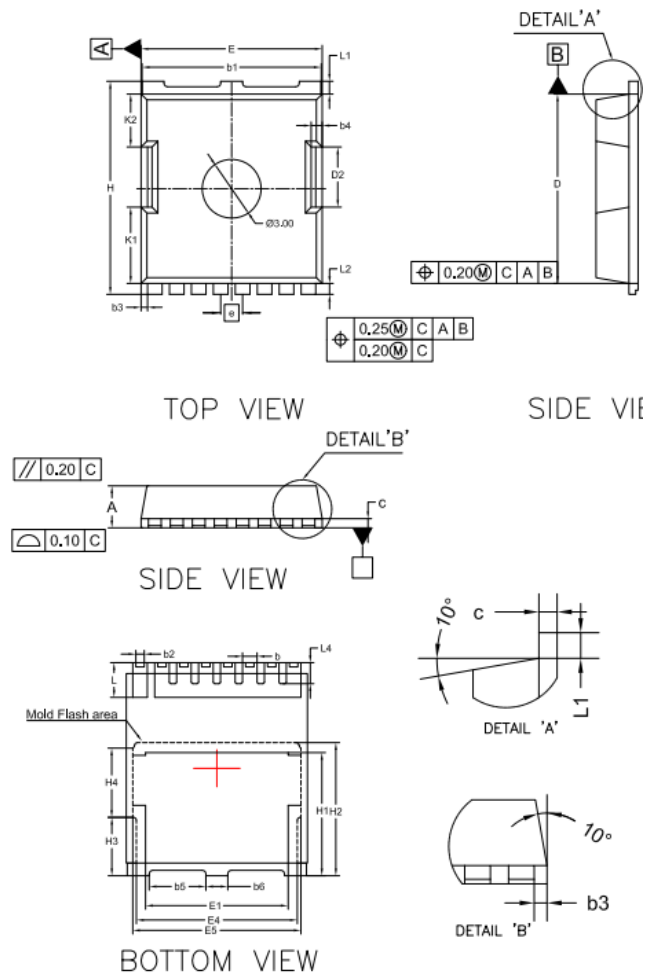


Figure 13.  $R_{\theta JC}$  Transient Thermal Impedance



### 5. Package Outline



SYMBOLS	DIMENSION IN MM		
	MIN	NOM	MAX
* A	2.200	2.300	2.400
c	0.492	0.500	0.508
* D	10.280	10.380	10.480
* E	9.800	9.900	10.000
e	1.20 BSC		
* H	11.580	11.680	11.780
H1	6.650	6.750	6.850
H2	7.300		
H3	3.200		
H4	3.800		
K1	4.180		
K2	2.900		
* D2	3.300		
b	0.700	0.800	0.900
b1	9.700	9.800	9.900
b2	0.420	0.460	0.500
b3	0.350		
b4	0.600		
b5	3.100		
b6	1.200		
L	1.700	1.900	2.100
L1	0.700		
L2	0.600		
L4	1.050	1.150	1.250
L5	0.500	0.600	0.700
E1	7.800		
E4	8.800		
E5	9.200		

Figure: Outline PG-TOLL(JW)

## Revision History

Revision	Date	Subjects (major changes since last revision)
1.0	2023-05-26	Preliminary version

## X-ON Electronics

Largest Supplier of Electrical and Electronic Components

*Click to view similar products for [MOSFET](#) category:*

*Click to view products by [ANHI](#) manufacturer:*

Other Similar products are found below :

[IRFD120](#) [IRFY240C](#) [JANTX2N5237](#) [2SK2267\(Q\)](#) [BUK455-60A/B](#) [MIC4420CM-TR](#) [VN1206L](#) [NDP4060](#) [SI4482DY](#)  
[IPS70R2K0CEAKMA1](#) [SQD23N06-31L-GE3](#) [TK16J60W,S1VQ\(O](#) [2SK2614\(TE16L1,Q\)](#) [DMN1017UCP3-7](#) [EFC2J004NUZTDG](#)  
[DMN1053UCP4-7](#) [SQJ469EP-T1-GE3](#) [NTE2384](#) [DMC2700UDMQ-7](#) [DMN2080UCB4-7](#) [DMN61D9UWQ-13](#) [US6M2GTR](#)  
[DMN31D5UDJ-7](#) [DMP22D4UFO-7B](#) [DMN1006UCA6-7](#) [DMN16M9UCA6-7](#) [STF5N65M6](#) [IRF40H233XTMA1](#) [STU5N65M6](#)  
[DMN6022SSD-13](#) [DMN13M9UCA6-7](#) [DMTH10H4M6SPS-13](#) [DMN2990UFB-7B](#) [IPB80P04P405ATMA2](#) [2N7002W-G](#) [MCAC30N06Y-](#)  
[TP](#) [MCQ7328-TP](#) [NTMC083NP10M5L](#) [NVMFS2D3P04M8LT1G](#) [BXP7N65D](#) [BXP4N65F](#) [AOL1454G](#) [WMJ80N60C4](#) [BXP2N20L](#)  
[BXP2N65D](#) [BXT1150N10J](#) [BXT1700P06M](#) [TSM60NB380CP](#) [ROG](#) [RQ7L055BGTCR](#) [DMNH15H110SK3-13](#)