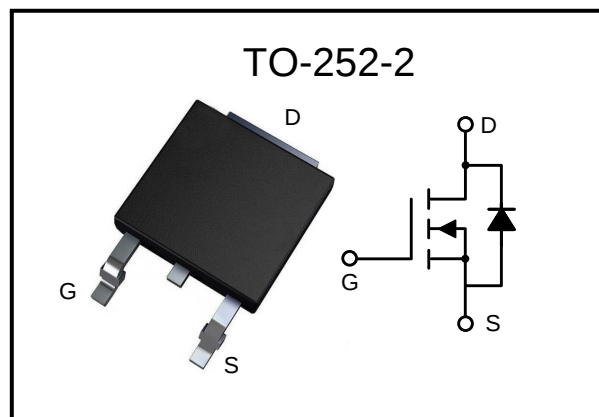


Features

- $V_{(BR)DSS}=100V$, $I_D=28A$
- $R_{DS(on)} @V_{GS}=10V$, TYP=30m Ω
- $R_{DS(on)} @V_{GS}=4.5V$, TYP=35m Ω
- Low On-resistance $R_{DS(ON)}$
- Low C_{rss}
- Fast switching
- Improved dv/dt capability

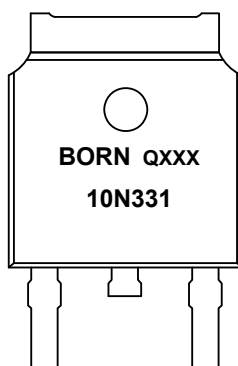
Package



Applications

- Load Switch
- Power Management
- PWM Application

Marking



Ordering information

Order code	Package	Marking	Base qty	Delivery mode
BMI10N331	TO-252-2	10N331	2500pcs/reel	5kpcs/box 25kpcs/carton

Absolute Maximum Ratings ($T_A=25^{\circ}C$ unless otherwise specified)

Symbol	Parameter	Value	Units
V_{DS}	Drain-Source Voltage	100	V
I_D	Drain Current	$T_C=25^{\circ}C$	A
		$T_C=100^{\circ}C$	
I_{DM}	Drain Current-Pulsed ⁽¹⁾	112	A
V_{GS}	Gate-Source Voltage	± 20	V
E_{AS}	Single Pulsed Avalanche Energy ⁽²⁾	34	mJ
P_D	Power Dissipation	$T_C=25^{\circ}C$	50 W



Thermal Characteristics

Symbol	Parameter	Value	Units
T_J, T_{stg}	Junction and Storage Temperature Range	-55 to +150	°C
$R_{\theta JC}$	Thermal Resistance From Junction to Case	2.5	°C/W
$R_{\theta JA}$	Thermal Resistance from Junction to Ambient	64	°C/W

Electrical Characteristics ($T_A=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Static Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D=250\mu A$	100	—	—	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 100V, V_{GS}=0V$	—	—	1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS}=0V$	—	—	± 100	nA
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS} = V_{DS}, I_D=250\mu A$	1.3	1.8	2.3	V
Static Drain-Source On Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=10A$	—	30	33	m Ω
		$V_{GS}=4.5V, I_D=8A$	—	35	42	
Dynamic Characteristics						
Input Capacitance	C_{iss}	$V_{DS} = 50V,$ $V_{GS} = 0V,$ $f = 1MHz$	—	445	—	pF
Output Capacitance	C_{oss}		—	171	—	
Reverse Transfer Capacitance	C_{rss}		—	3.2	—	
Switching Characteristics ⁽³⁾						
Turn-On Delay Time	$T_{d(on)}$	$V_{DD}=50V,$ $V_{GS}=10V,$ $R_G = 5\Omega,$ $I_D=10A$	—	12	—	ns
Turn-On Rise Time	T_r		—	15	—	
Turn-Off Delay Time	$T_{d(off)}$		—	20	—	
Turn-Off Fall Time	T_f		—	6	—	
Total Gate Charge	Q_g	$V_{DS}=50V,$ $V_{GS}=10V,$ $I_D=10A$	—	8.07	—	nC
Gate-Source Charge	Q_{gs}		—	1.38	—	
Gate-Drain Charge	Q_{gd}		—	1.84	—	
Source-Drain Diode Characteristics						
Continuous Diode Forward Current	I_S	—	—	—	28	A
Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=10A$	—	—	1.2	V
Reverse Recovery Time	t_{rr}	$I_F=10A,$ $di_F/dt=100A/\mu s$	—	37	—	ns
Reverse Recovery Charge	Q_{rr}		—	80	—	nC

Notes:

- (1) Repetitive Rating: pulse width limited by maximum junction temperature.
- (2) $V_{DD} = 50V, R_G = 25\Omega, L = 0.5mH$, Starting $T_J = 25^\circ\text{C}$.
- (3) Pulsed Test: pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.



Typical Performance Characteristics

Figure 1: Typical Output Characteristics

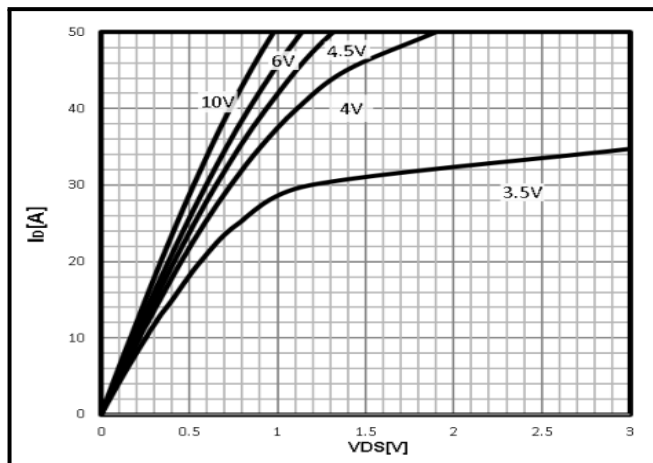


Figure 2: Typical Transfer Characteristics

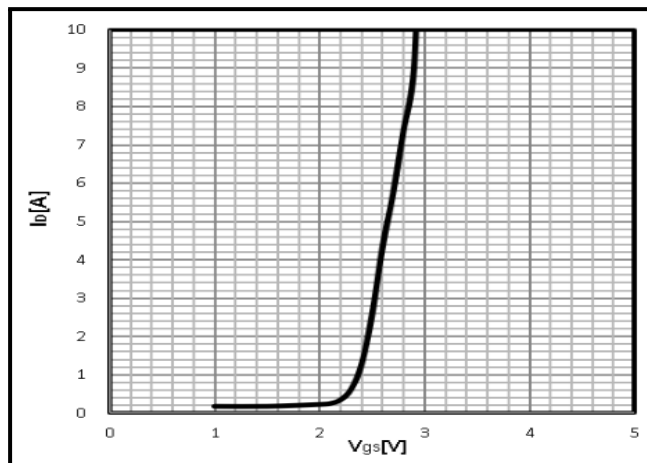


Figure 3: On-Resistance vs Drain Current

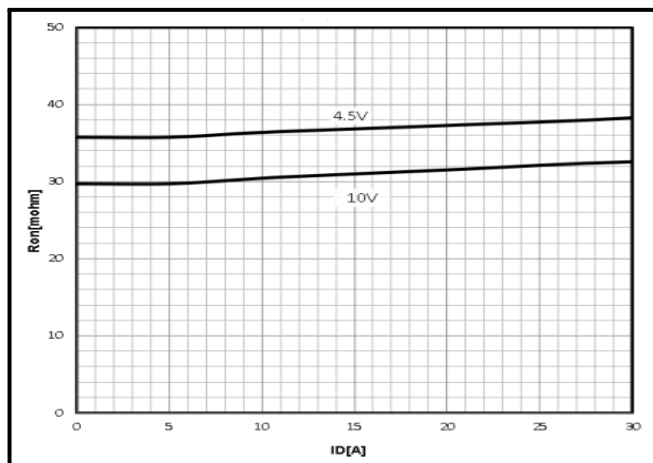


Figure 4: On-Resistance vs Junction Temperature

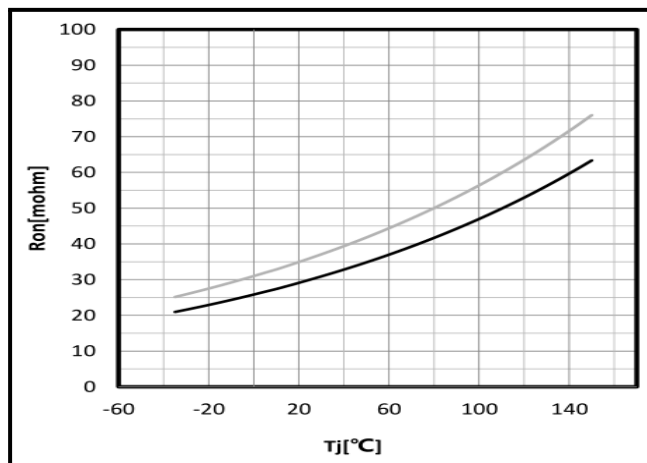


Figure 5: Gate Threshold Voltage

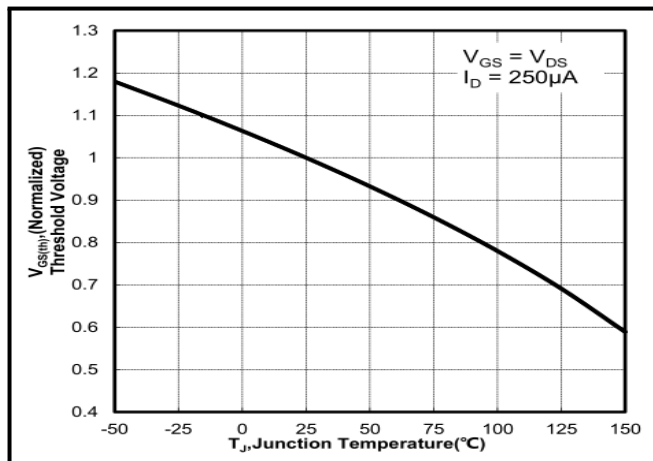
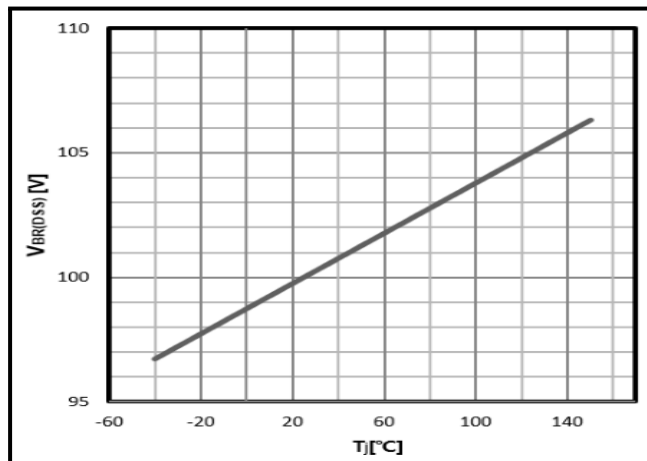


Figure 6: Drain-Source Breakdown Voltage



Typical Performance Characteristics

Figure 7: Gate Charge Characteristics

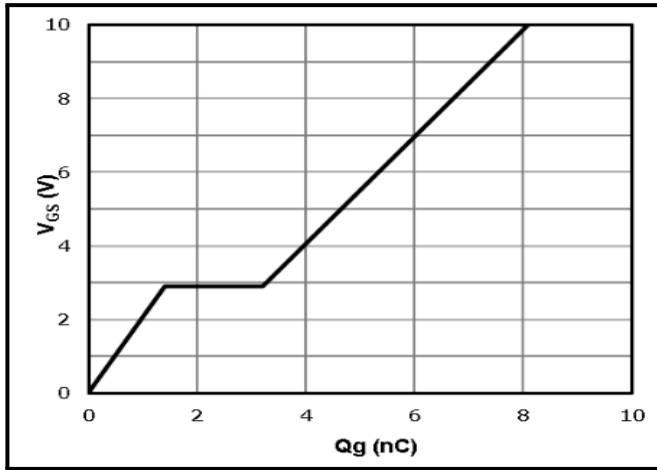


Figure 8: Capacitance Characteristics

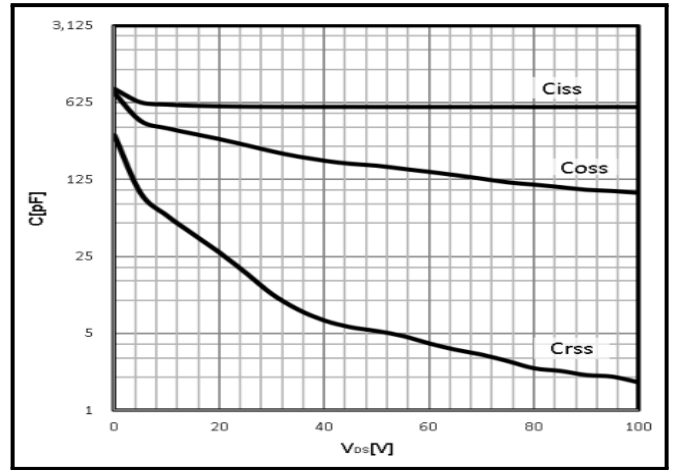


Figure 9: Power Dissipation

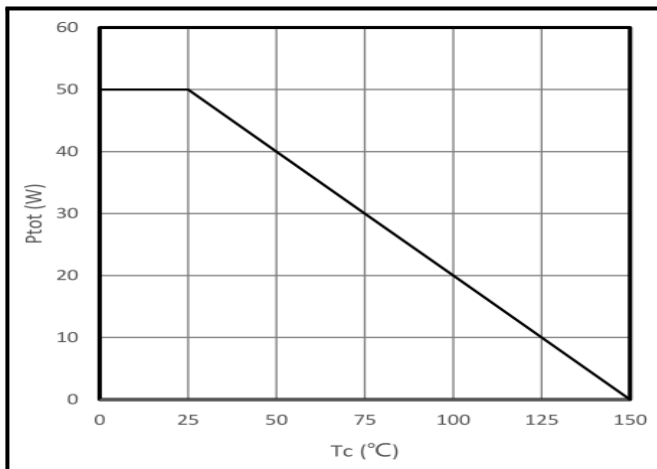


Figure 10: Maximum Drain Current vs Temperature

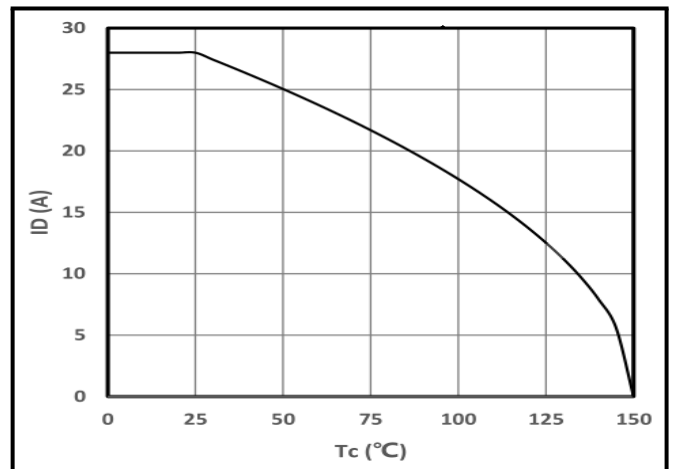


Figure 11: Safe Operating Area

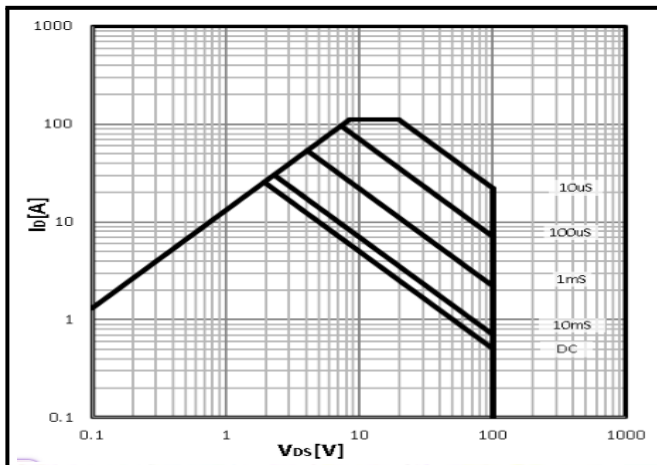
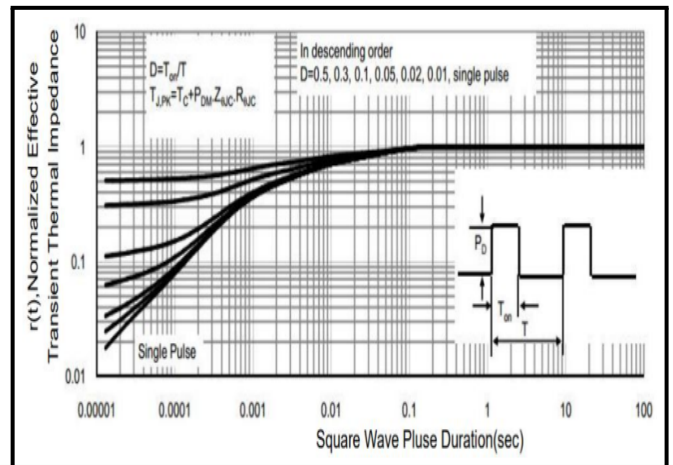
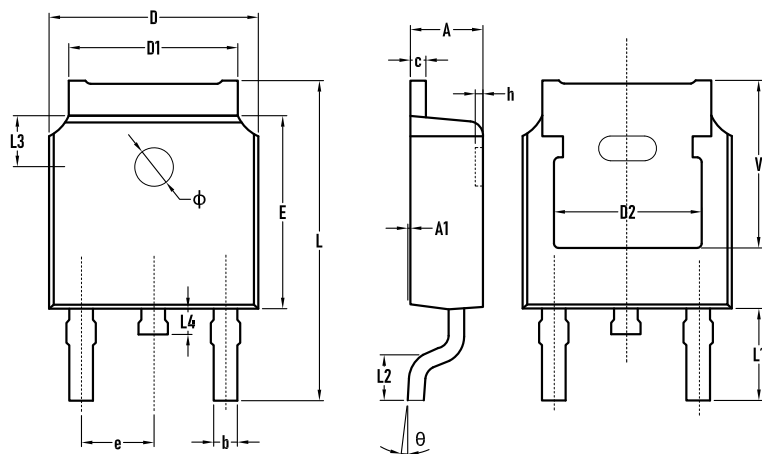


Figure 12: Transient Thermal Response Curve





Symbol	Millimeters		Inches	
	MIN.	MAX.	MIN.	MAX.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.660	0.860	0.026	0.034
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	4.830 TYP.		0.190 TYP.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.800	10.400	0.386	0.409
L1	2.900 TYP.		0.114 TYP.	
L2	1.400	1.700	0.055	0.067
L3	1.600 TYP.		0.063 TYP.	
L4	0.600	1.000	0.024	0.039
ϕ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.350 TYP.		0.211 TYP.	

