

100V N-Channel Enhancement Mode MOSFET

RC023N10BGTL

■ Product Information

■ Features

- Surface-mounted package
- Advanced SGT cell design
- MSL1

■ Applications

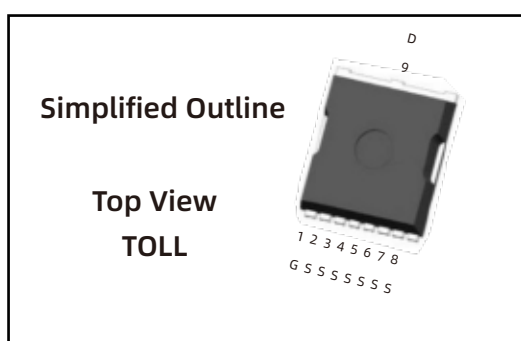
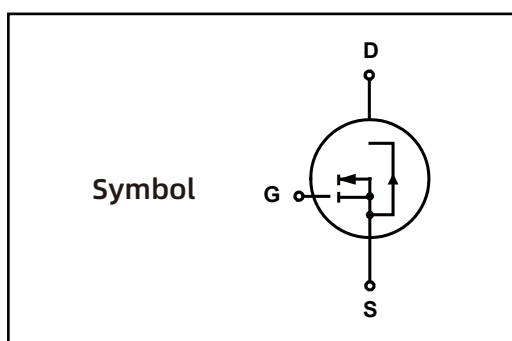
- BMS
- Drones
- High power inverter system
- Light electric vehicles

■ Quick reference

- $BV \geq 100\text{ V}$
- $P_{\text{tot}} \leq 286\text{ W}$
- $I_D \leq 280\text{ A}$

- $R_{\text{DS(ON)}} \leq 2.3\text{m}\Omega @ V_{\text{GS}} = 10\text{ V}$

■ Pin Description



■ Marking Information

Product Name	Marking
RC023N10BGTL	RC023N10BGTL

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■ Limiting Values

Symbol	Parameter	Conditions	Min	Max	Unit
V_{DS}	Drain-Source Voltage	$T_C = 25\text{ }^{\circ}\text{C}$	100	-	V
V_{GS}	Gate-Source Voltage	$T_C = 25\text{ }^{\circ}\text{C}$	-	± 20	V
I_D	Drain Current (DC)	$T_C = 25\text{ }^{\circ}\text{C}, V_{GS} = 10\text{ V}$	-	280	A
		$T_C = 100\text{ }^{\circ}\text{C}, V_{GS} = 10\text{ V}$	-	190	A
I_{DM}^*	Drain Current (Pulsed)	$T_C = 25\text{ }^{\circ}\text{C}, V_{GS} = 10\text{ V}$	-	1200	A
P_{tot}	Drain power dissipation	$T_C = 25\text{ }^{\circ}\text{C}$	-	286	W
T_{stg}	Storage Temperature		-55	150	$^{\circ}\text{C}$
T_J	Junction Temperature		-	150	$^{\circ}\text{C}$
I_S	Continuous-Source Current	$T_C = 25\text{ }^{\circ}\text{C}$	-	280	A
E_{AS}	Single Pulsed Avalanche Energy	$V_{DD} = 40\text{ V}, L = 0.1\text{mH}$	-	1750	mJ
$R_{\theta JA}^{**}$	Thermal Resistance- Junction to Ambient		-	32.8	$^{\circ}\text{C/W}$
$R_{\theta JC}^{**}$	Thermal Resistance- Junction to Case		-	0.45	

Notes :

- * Pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$
- ** Surface Mounted on minimum footprint pad area.
- *** limited by bonding wire

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■ Electrical Characteristics (TA=25 ° Unless Otherwise Noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} = 0 V, I _{DS} = 250 μA	100	-	-	V
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _{DS} = 250 μA	2	-	4	V
I _{DSS}	Drain Leakage Current	V _{DS} = 80 V, V _{GS} = 0 V	-	-	1	μA
I _{GSS}	Gate Leakage Current	V _{GS} = 0V, V _{GS} = ±20V	-	-	±100	nA
R _{DS(ON)} ^a	On-State Resistance	V _{GS} = 10 V, I _{DS} = 20 A	-	-	2.3	mΩ
Diode Characteristics						
V _{SD} ^a	Diode Forward Voltage	I _{SD} = 20 A, V _{GS} = 0 V	-	-	1.3	V
t _{rr}	Reverse Recovery Time	I _{DS} = 20 A, V _{GS} = 0 V	-	80	-	nS
Q _{rr}	Reverse Recovery Charge	dI _{SD} /dt = 100 A/μs	-	195	-	nC
Dynamic Characteristics ^b						
C _{iSS}	Input Capacitance	V _{GS} = 0 V, V _{DS} = 50 V Frequency = 1 MHz	-	9200	-	pF
C _{OSS}	Output Capacitance		-	1130	-	
C _{rSS}	Reverse Transfer Capacitance		-	110	-	
t _{d(on)}	Turn-on Delay Time	V _{DS} = 50 V, V _{GEN} = 10 V, R _G = 4.5 Ω, R _L = 2.5 Ω, I _{DS} = 20 A	-	32	-	nS
t _r	Turn-on Rise Time		-	40	-	
t _{d(off)}	Turn-off Delay Time		-	80	-	
t _f	Turn-off Fall Time		-	35	-	
Gate Charge Characteristics ^b						
Q _g	Total Gate Charge	V _{DS} = 50 V, V _{GS} = 10 V, I _{DS} = 20 A	-	131	-	nC
Q _{gs}	Gate-Source Charge		-	50	-	
Q _{gd}	Gate-Drain Charge		-	24.5	-	

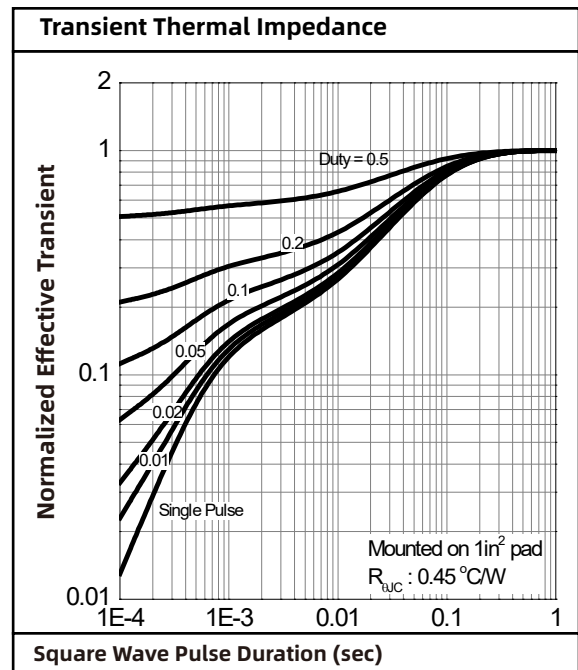
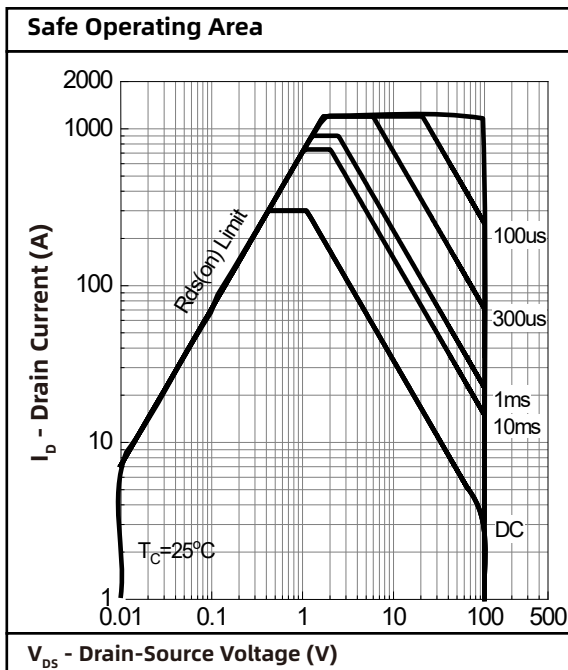
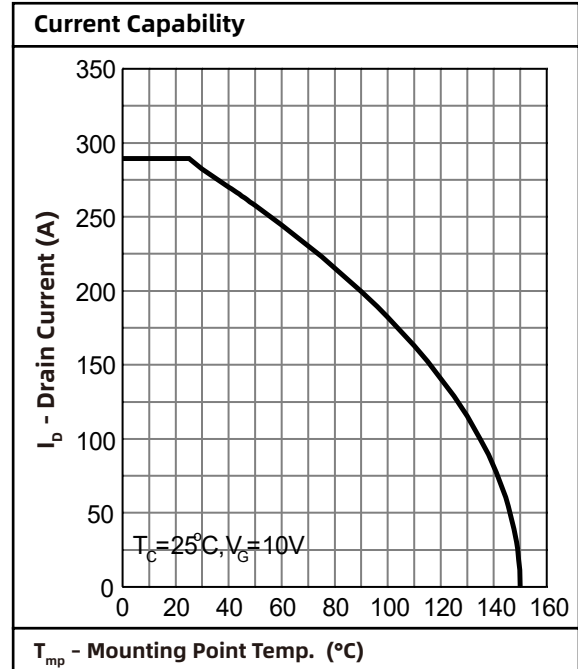
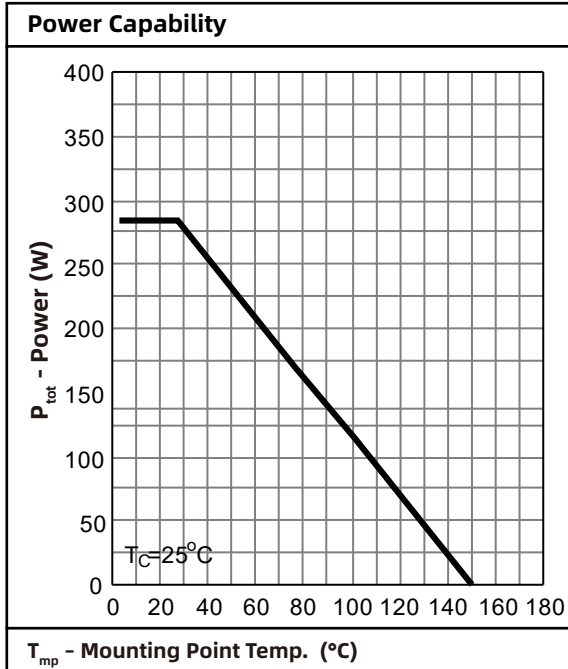
Notes :

a : Pulse test ; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$

b : Guaranteed by design, not subject to production testing

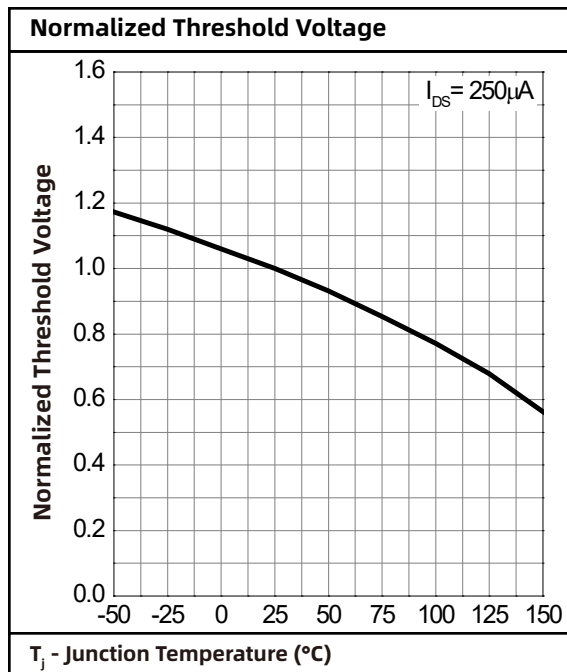
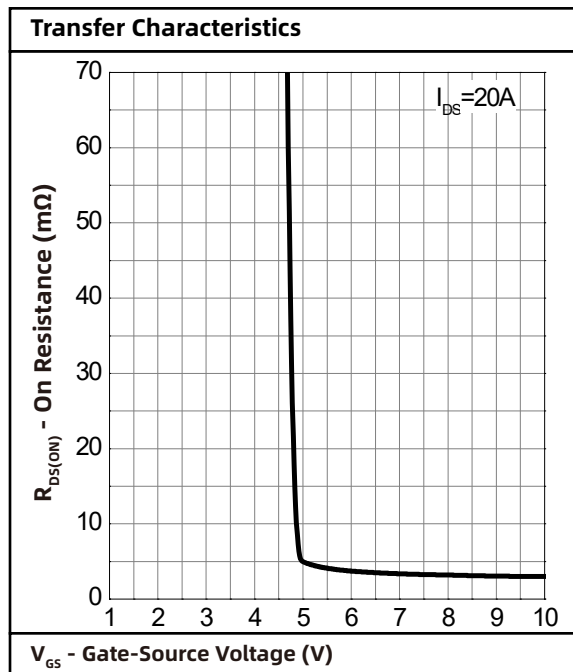
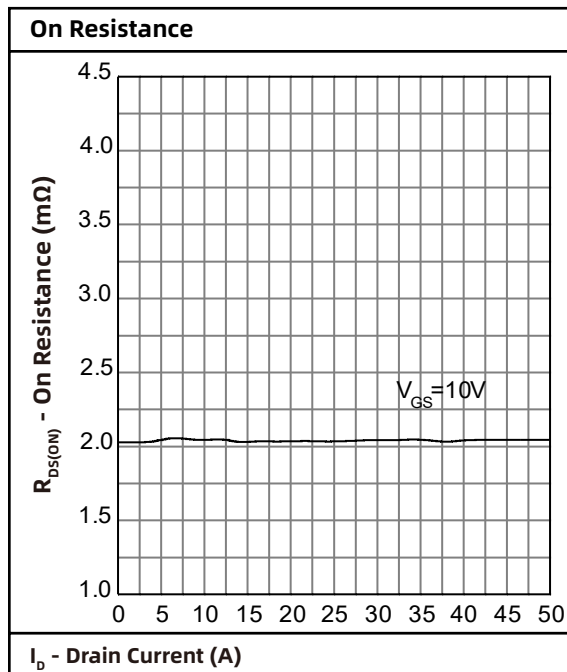
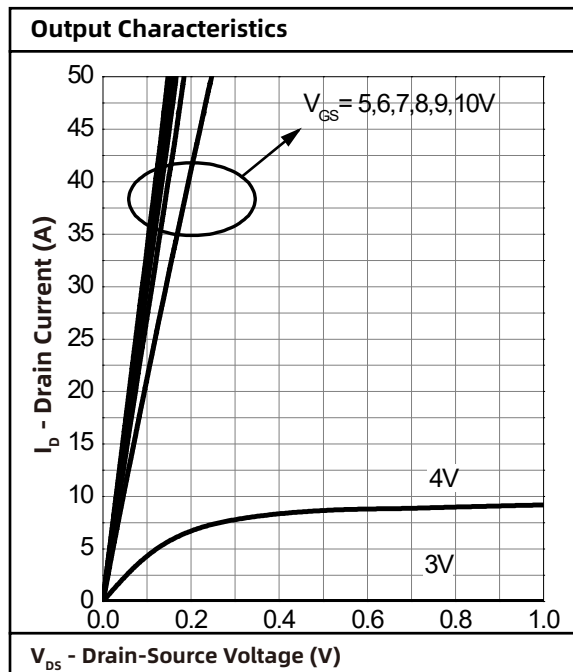
100V N-Channel Enhancement Mode MOSFET RC023N10BGTL

■ Typical Characteristics



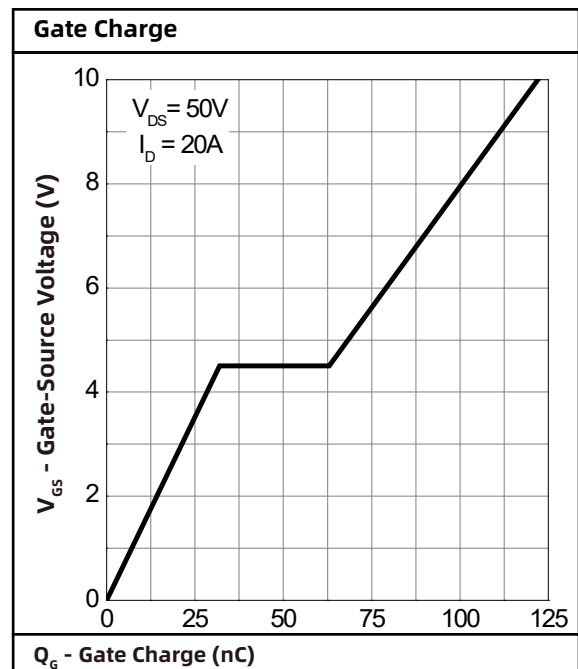
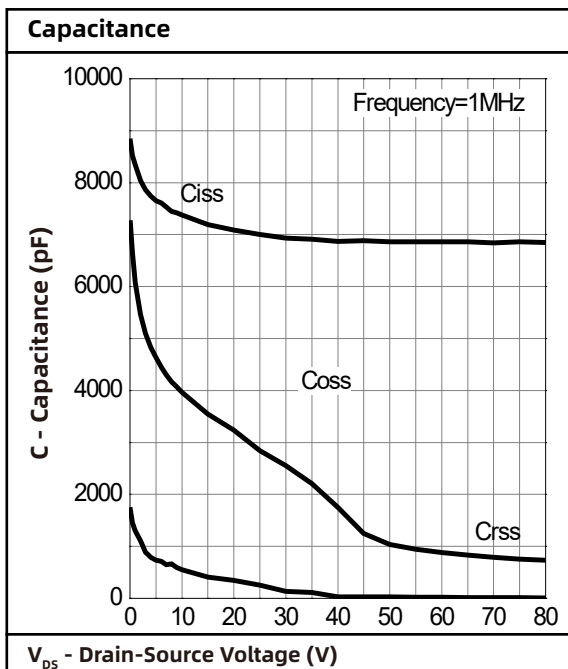
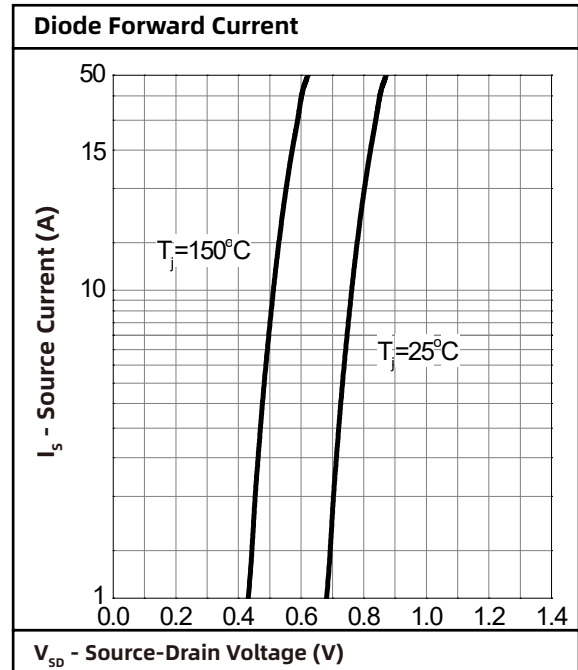
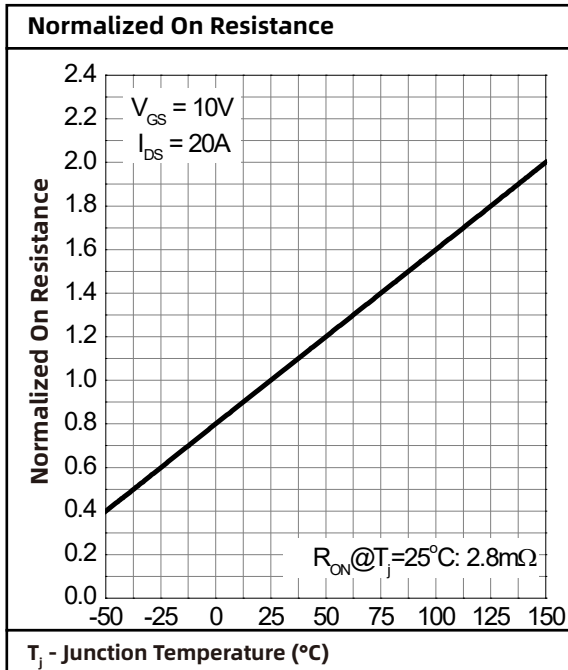
100V N-Channel Enhancement Mode MOSFET RC023N10BGT

■ Typical Characteristics (cont.)



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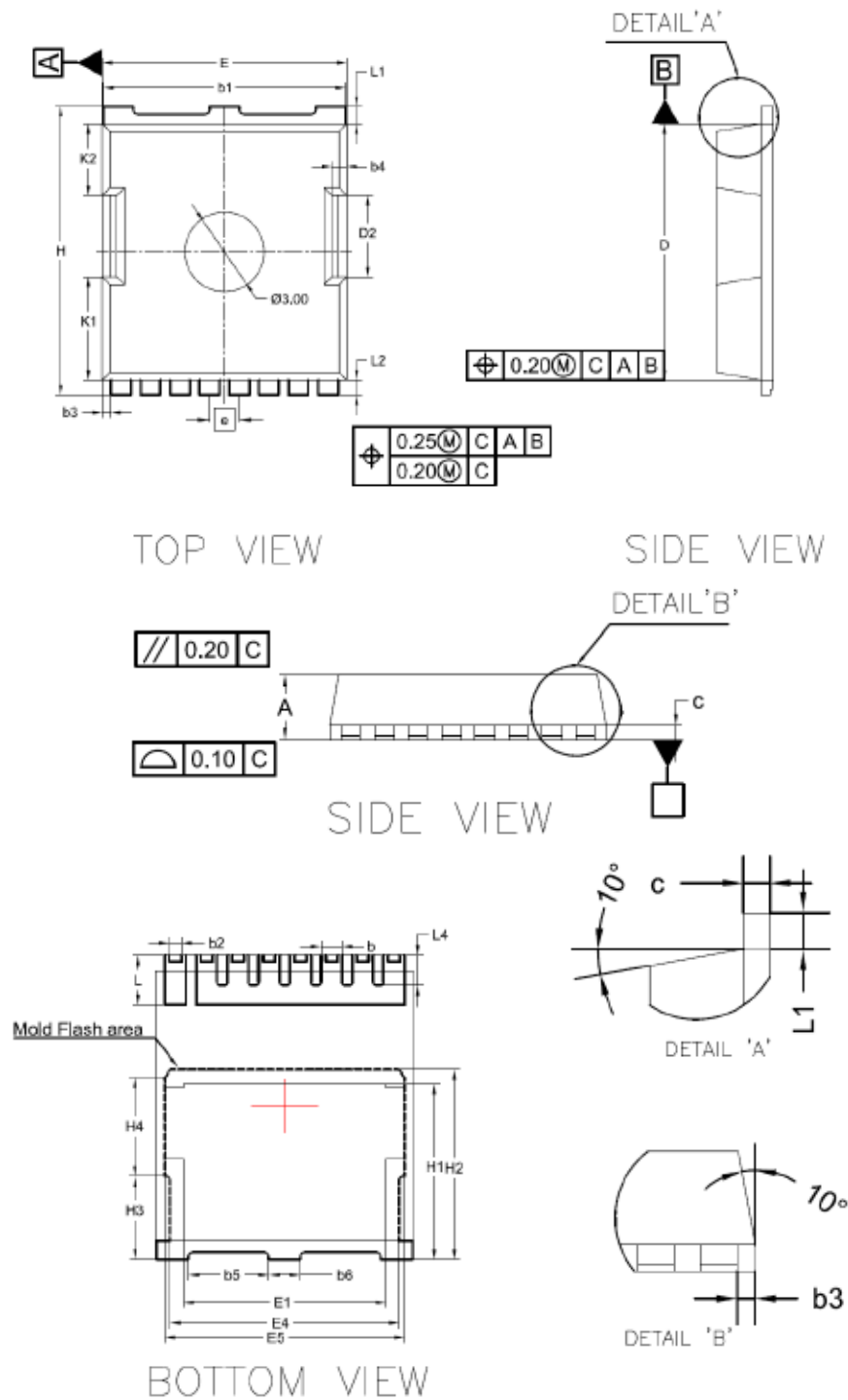
■ Typical Characteristics (cont.)



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■ Package Dimensions

TOLL-8 Package



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■ Package Dimensions

TOLL-8 Package

Symbol	Dimensions In Millimeters			Dimensions In INCHES		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	2.200	2.300	2.400	0.087	0.091	0.094
c	0.492	0.500	0.508	0.019	0.020	0.021
D	10.280	10.380	10.480	0.405	0.409	0.413
E	9.800	9.900	10.000	0.386	0.390	0.394
e	1.20 BSC			0.047 BSC		
H	11.580	11.680	11.780	0.456	0.460	0.464
H1	6.650	6.750	6.850	0.262	0.266	0.270
H2	7.300			0.287		
H3	3.200			0.126		
H4	3.800			0.150		
K1	4.180			0.165		
K2	2.900			0.114		
D2	3.300			0.130		
b	0.700	0.800	0.900	0.028	0.031	0.035
b1	9.700	9.800	9.900	0.382	0.386	0.390
b2	0.420	0.460	0.500	0.017	0.018	0.020
b3	0.350			0.014		
b4	0.600			0.024		
b5	3.100			0.122		
b6	1.200			0.047		
L	1.700	1.900	2.100	0.067	0.075	0.083
L1	0.700			0.028		
L2	0.600			0.024		
L4	1.050	1.150	1.250	0.041	0.045	0.049
L5	0.500	0.600	0.700	0.020	0.024	0.028
E1	7.800			0.310		
E4	8.800			0.350		
E5	9.200			0.360		