

Features

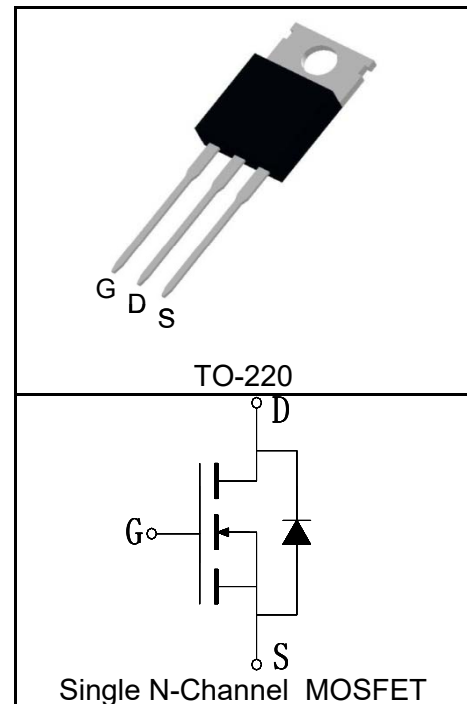
- 40V/140A,
 $R_{DS(ON)} = 3m\Omega(Typ.)@V_{GS}=10V$
- Low $R_{DS(ON)}$
- Super High Dense Cell Design
- Fast Recovery Body Diode
- 100% Avalanche Tested

Applications

- Synchronous Rectification
- UPS Inverter
- High efficiency DC/DC Converters



Pin Description



Absolute Maximum Ratings

Symbol	Parameter		Rating	Unit
Common Ratings (T _C =25°C Unless Otherwise Noted)				
V _{DSS}	Drain-Source Voltage		40	V
V _{GSS}	Gate-Source Voltage		±20	
T _J	Maximum Junction Temperature		175	°C
T _{STG}	Storage Temperature Range		-55 to 175	°C
I _S	Diode Continuous Forward Current	T _C =25°C	140	A
Mounted on Large Heat Sink				
I _{DP} ^①	300μs Pulse Drain Current Tested	T _C =25°C	560	A
I _D ^②	Continuous Drain Current(V _{GS} =10V)	T _C =25°C	140	A
		T _C =100°C	98	
P _D	Maximum Power Dissipation	T _C =25°C	125	W
		T _C =100°C	62	
R _{θJC}	Thermal Resistance-Junction to Case		1.2	°C/W
R _{θJA} ^③	Thermal Resistance-Junction to Ambient		62.5	°C/W
Drain-Source Avalanche Ratings				
E _{AS} ^④	Avalanche Energy, Single Pulsed		500	mJ

Electrical Characteristics ($T_C=25^{\circ}\text{C}$ Unless Otherwise Noted)

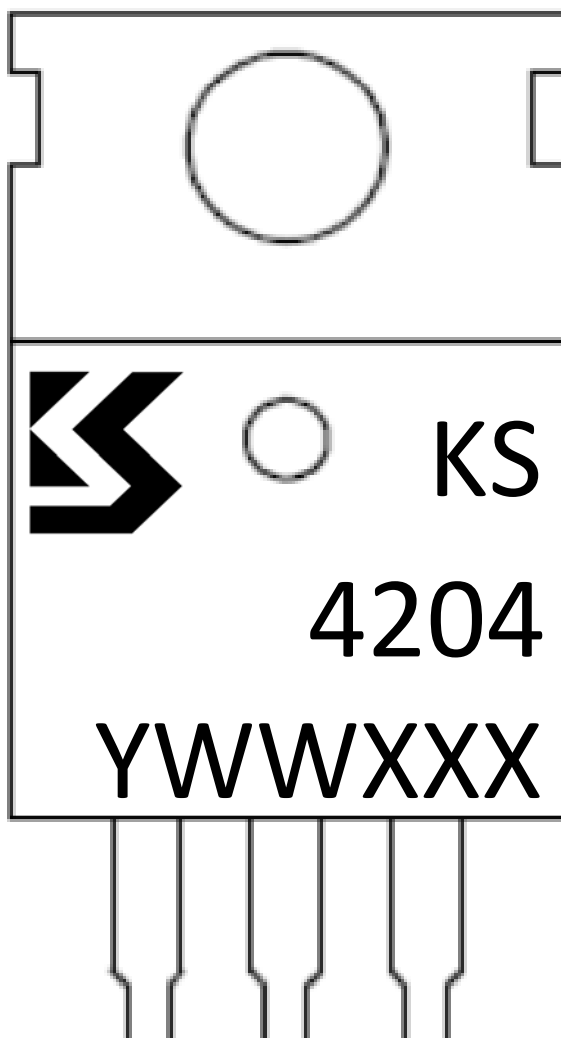
Symbol	Parameter	Test Condition	KS4204CA			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250μA	40			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =40V, V _{GS} =0V			5	μA
			T _J =125°C			
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250μA	2		4	V
I _{GSS}	Gate Leakage Current	V _{GS} =±20V, V _{DS} =0V			±100	nA
R _{DS(ON)} ^⑤	Drain-Source On-state Resistance	V _{GS} =10V, I _{DS} =80A		3	4	mΩ
Diode Characteristics						
V _{SD} ^⑤	Diode Forward Voltage	I _{SD} =80A, V _{GS} =0V			1.2	V
t _{rr}	Reverse Recovery Time	I _{SD} =80A, dI _{SD} /dt=100A/μs		50		ns
Q _{rr}	Reverse Recovery Charge			36		nC
Dynamic Characteristics ^⑥						
R _G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz		3.5		Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =20V, Frequency=1.0MHz		2980		pF
C _{oss}	Output Capacitance			430		
C _{rss}	Reverse Transfer Capacitance			230		
t _{d(ON)}	Turn-on Delay Time	V _{DD} =20V, I _{DS} =50A, V _{GEN} =10V, R _G =10Ω		16		ns
t _r	Turn-on Rise Time			59		
t _{d(OFF)}	Turn-off Delay Time			74		
t _f	Turn-off Fall Time			41		
Gate Charge Characteristics ^⑥						
Q _g	Total Gate Charge	V _{DS} =20V, V _{GS} =10V, I _{DS} =80A		51		nC
Q _{gs}	Gate-Source Charge			15		
Q _{gd}	Gate-Drain Charge			8		

Notes:

- ① Pulse width limited by safe operating area.
- ② Calculated continuous current based on maximum allowable junction temperature. The package limitation current is 75A.
- ③ When mounted on 1 inch square copper board, $t \leq 10\text{sec}$. The value in any given application depends on the user's specific board design.
- ④ Limited by T_{Jmax} , $I_{AS}=44A$, $L=0.5\text{mH}$, $V_{DD}=24V$, $R_G=25\Omega$, Starting $T_J=25^{\circ}\text{C}$.
- ⑤ Pulse test; Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
- ⑥ Guaranteed by design, not subject to production testing.

Ordering and Marking Information

Device	Package	Packaging	Quantity	Reel Size	Tape width
KS4204CA	TO-220	Tube	50	-	-

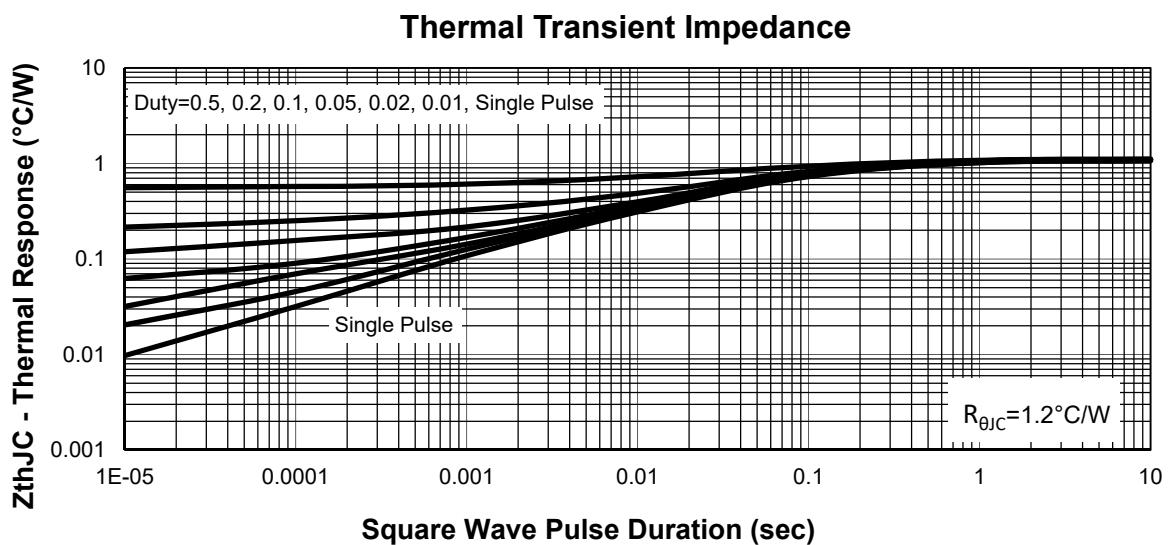
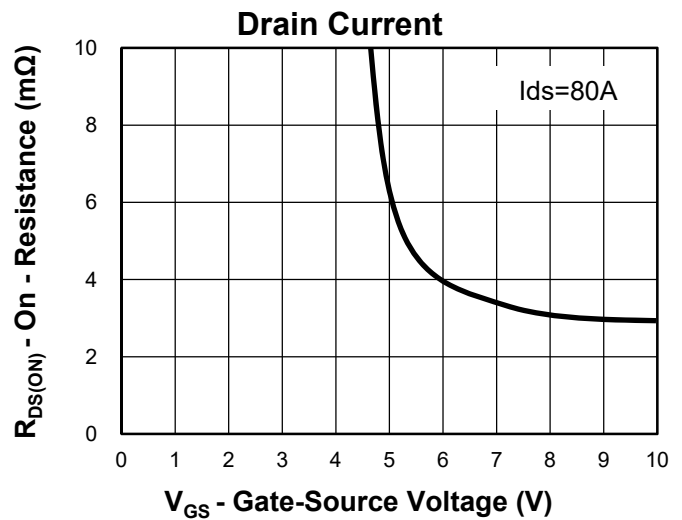
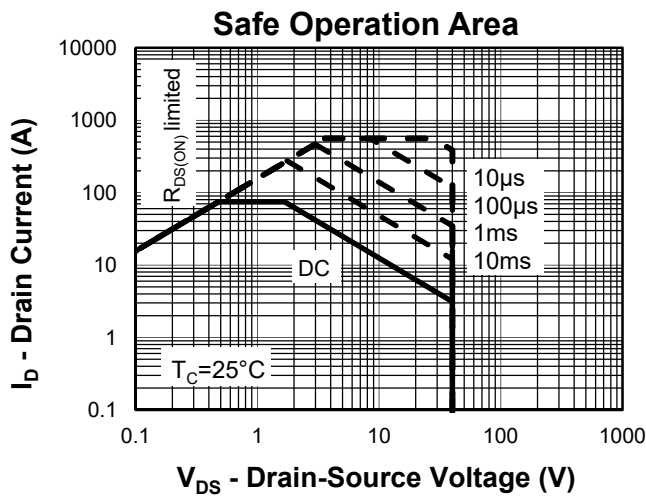
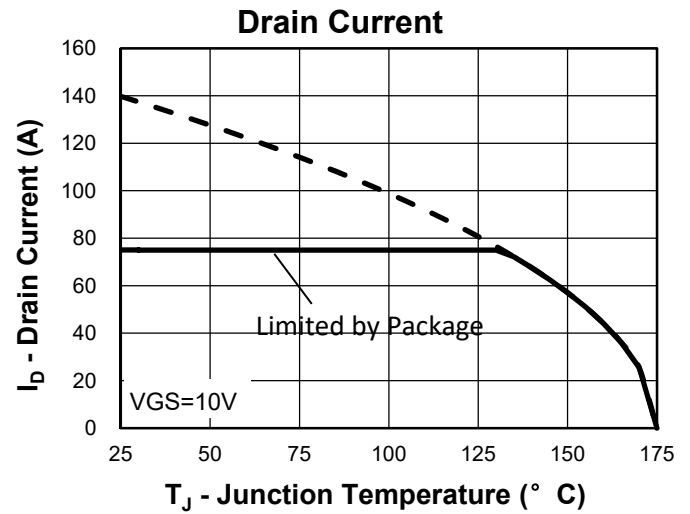
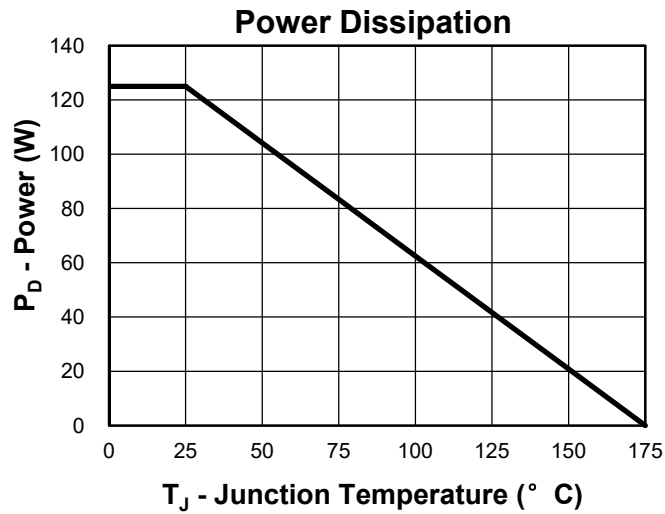


Y =Year,2017-A,2018-B,etc.

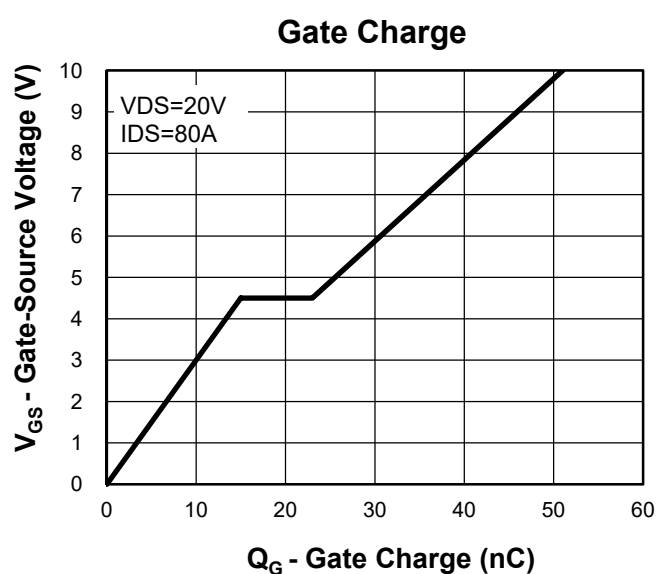
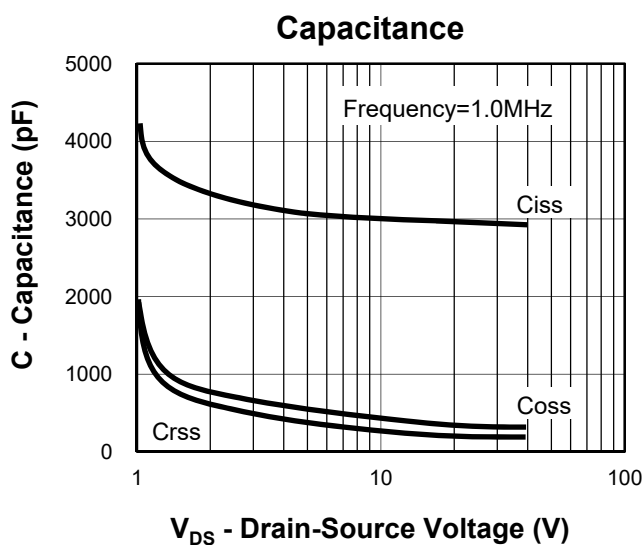
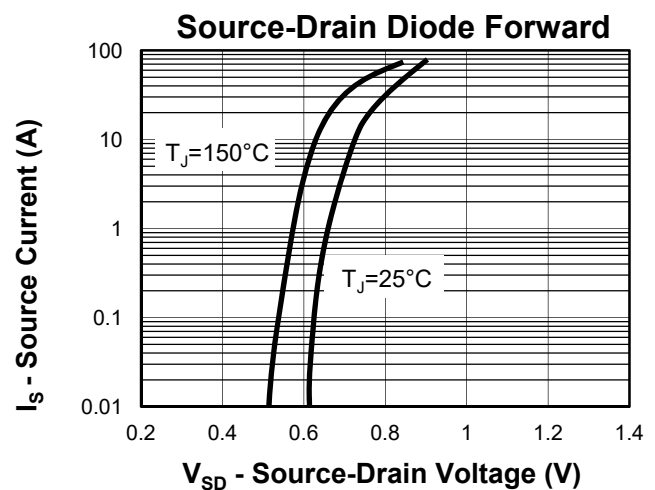
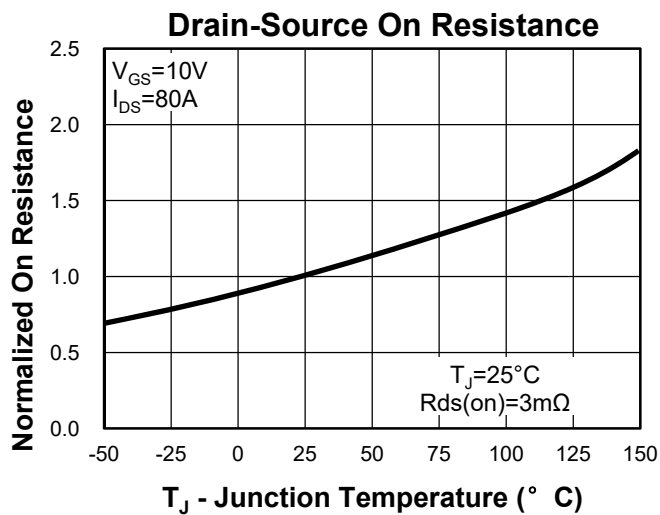
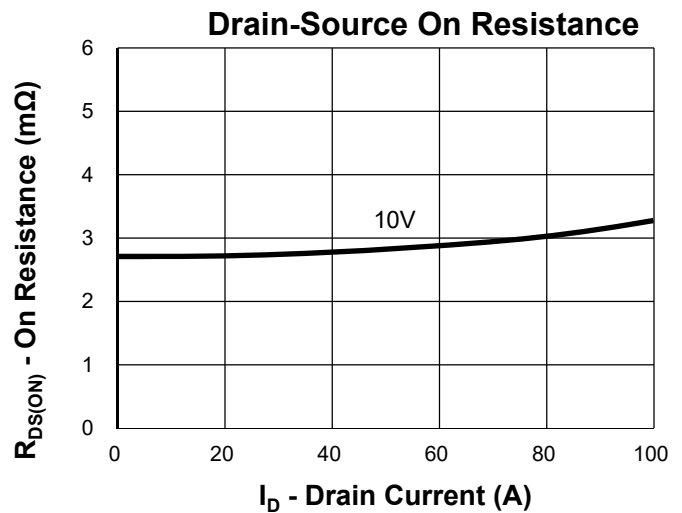
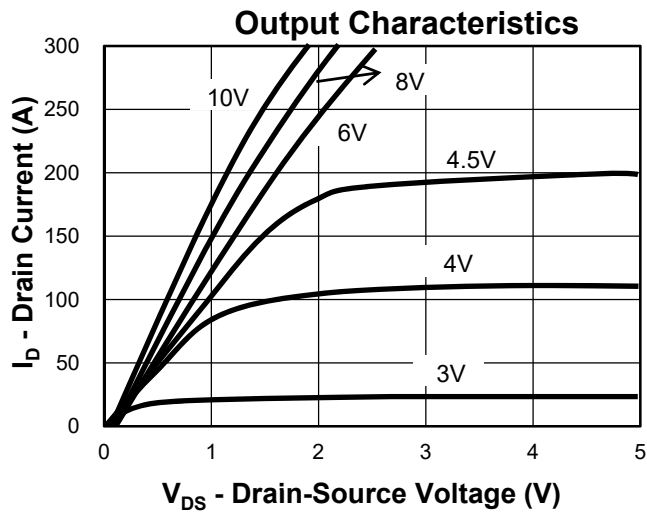
WW =Week.

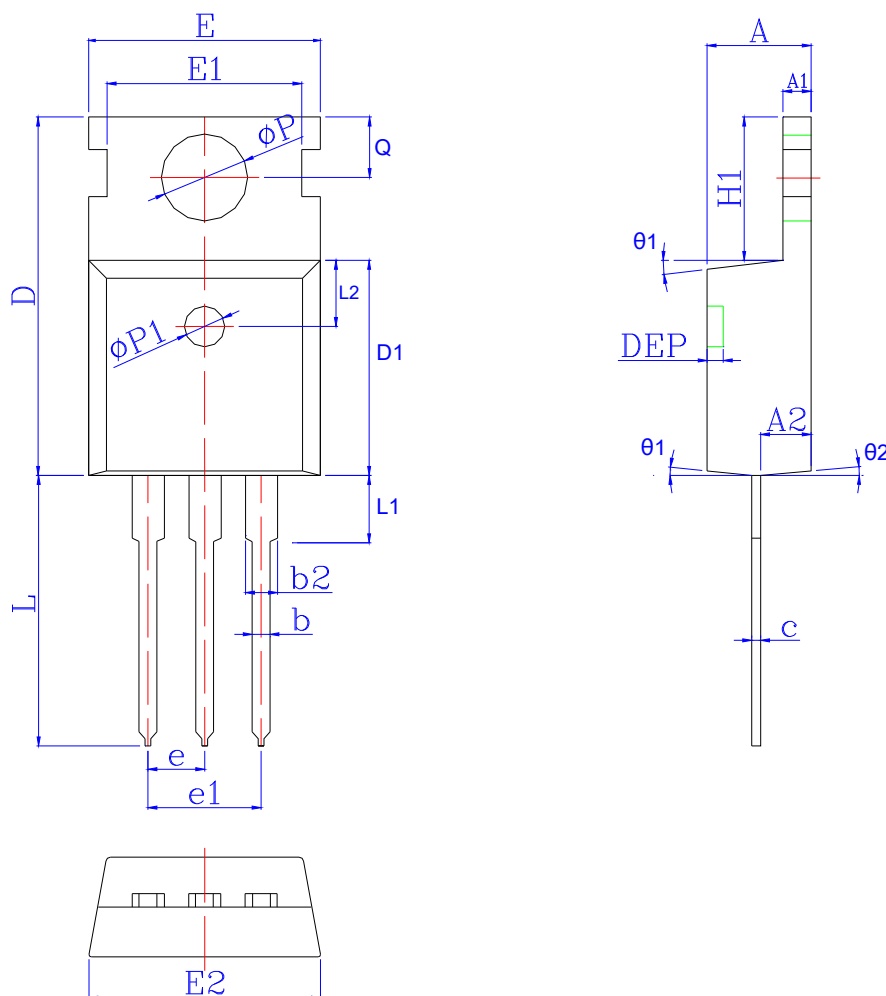
XXX =Lot number.

Typical Characteristics



Typical Characteristics



Package Information
TO-220


SYMBOL	MM			INCH			SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX		MIN	NOM	MAX	MIN	NOM	MAX
A	4.30	4.54	4.77	0.169	0.179	0.188	$\Phi p1$	1.40	1.50	1.60	0.055	0.059	0.063
A1	1.15	1.30	1.40	0.045	0.051	0.055	e	2.54 BSC			0.10 BSC		
A2	1.90	2.25	2.60	0.075	0.089	0.102	e1	5.08 BSC			0.20 BSC		
b	0.60	0.80	1.00	0.024	0.031	0.039	H1	6.30	6.50	6.80	0.248	0.256	0.268
b2	1.17	1.28	1.72	0.046	0.050	0.068	L	12.70	13.18	13.65	0.500	0.519	0.537
c	0.40	0.50	0.60	0.016	0.020	0.024	L1	*	*	3.95	*	*	0.156
D	15.40	15.70	16.00	0.606	0.618	0.630	L2	2.50 REF			0.098 REF		
D1	8.96	9.21	9.46	0.353	0.363	0.372	Φp	3.50	3.60	3.75	0.138	0.142	0.148
DEP	*	*	0.30	*	*	0.012	Q	2.70	2.80	3.20	0.106	0.110	0.126
E	9.66	9.97	10.28	0.380	0.393	0.405	$\theta 1$	5°	7°	9°	5°	7°	9°
E1	*	8.70	*	*	0.343	*	$\theta 2$	1°	3°	5°	1°	3°	5°
E2	9.80	10.00	10.20	0.386	0.394	0.402							

Avalanche Test Circuit and Waveforms



Switching Time Test Circuit and Waveforms



Diode Recovery Test Circuit and Waveforms



Gate Charge Test Circuit and Waveform



Customer Service

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