



- Non Punch Through (NPT) Technology
- Short Circuit Rated $>10\mu\text{s}$
- Low Saturation Voltage
- Low Switching Loss
- 100% RBSOA Tested($2\times I_c$)
- Low Stray Inductance
- Lead Free, Compliant with RoHS Requirement

- Welding
- HEV Inverter
- Industrial Motor Drives
- UPS

V _{CES}	Collector-Emitter Blocking Voltage	T _J =25°C	600	V
V _{GES}	Gate-Emitter Voltage		±20	V
I _C	Continuous Collector Current	T _C =80°C	150	A
		T _C =25°C	300	A
I _{CM}	Repetitive Peak Collector Current	tp=1ms	300	A
P _D	Maximum Power Dissipation per leg	T _C =25°C T _{Jmax} =150°C	731	W



Electrical Characteristics of IGBT

Static Characteristics

Symbol	Description	Conditions	Min.	Typ.	Max.	Units
$V_{GE(th)}$	Gate-Emitter Threshold Voltage	$I_C=6mA, V_{CE}=V_{GE}, T_J=25^{\circ}C$	4.3	5.3	6.4	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C=150A, V_{GE}=15V$	$T_J=25^{\circ}C$	2.10	2.50	V
			$T_J=125^{\circ}C$	2.40		
			$T_J=150^{\circ}C$	2.50		
I_{CES}	Collector-Emitter Leakage Current	$V_{GE}=0V, V_{CE}=V_{CES}, T_J=25^{\circ}C$			1	mA
I_{GES}	Gate-Emitter Leakage Current	$V_{GE}=\pm 20V, V_{CE}=0V, T_J=25^{\circ}C$			± 200	nA
C_{ies}	Input Capacitance	$V_{CE}=25V, V_{GE}=0V, f=100kHz, T_J=25^{\circ}C$		5.58		nF
C_{oes}	Output Capacitance			0.83		
C_{res}	Reverse Transfer Capacitance			0.57		

Switching Characteristics

Symbol	Description	Conditions		Min.	Typ.	Max.	Units
$t_{d(on)}$	Turn-on Delay Time	$V_{CC}=300V, I_C=150A,$ $R_{Gon}=10\Omega, V_{GE}=\pm 15V,$ Inductive Load	$T_J=25^{\circ}C$		267		ns
			$T_J=125^{\circ}C$		280		
			$T_J=150^{\circ}C$		271		
t_r	Rise Time		$T_J=25^{\circ}C$		120		ns
			$T_J=125^{\circ}C$		118		
			$T_J=150^{\circ}C$		118		
$t_{d(off)}$	Turn-off Delay Time	$V_{CC}=300V, I_C=150A,$ $R_{Goff}=10\Omega, V_{GE}=\pm 15V,$ Inductive Load	$T_J=25^{\circ}C$		373		ns
			$T_J=125^{\circ}C$		394		
			$T_J=150^{\circ}C$		393		
t_f	Fall Time		$T_J=25^{\circ}C$		115		ns
			$T_J=125^{\circ}C$		126		
			$T_J=150^{\circ}C$		134		
E_{on}	Turn-on Switching Loss	$V_{CC}=300V, I_C=150A,$ $R_{Gon}=10\Omega, V_{GE}=\pm 15V,$ $di/dt=1121A/\mu s(T_J=150^{\circ}C),$ Inductive Load	$T_J=25^{\circ}C$		1.41		mJ
			$T_J=125^{\circ}C$		2.15		
			$T_J=150^{\circ}C$		2.32		



E _{off}	Turn-off Switching Loss	V _{CC} =300V, I _C =150A, R _{Goff} =10Ω, V _{GE} =±15V, du/dt=2614V/μs(T _J =150°C), Inductive Load	T _J =25°C		4.38		mJ
			T _J =125°C		4.54		
			T _J =150°C		4.81		
Q _g	Total Gate Charge	V _{GE} =+15V...-15V	T _J =25°C		805		nC
R _{g internal}	Internal Gate Resistance		T _J =25°C		2.35		Ω
RBSOA	I _C =300A, V _{CC} =480V, V _P =600V, R _G =10Ω, V _{GE} =+15V to 0V, T _J =150°C			Trapezoid			
SCSOA	V _{CC} =300V, V _{GE} =+/-15V, R _G =10Ω, T _J =125°C			10			us
R _{θJC}	Thermal Resistance: Junction-to-Case (per IGBT)					0.171	°C/W

Maximum Rated Values of Diode

V _{RRM}	Repetitive Peak Reverse Voltage	T _J =25°C	600	V
I _F	Diode Continuous Forward Current		150	A
I _{FM}	Diode Maximum Forward Current	tp=1ms	300	A

Electrical Characteristics of Diode

Symbol	Description	Conditions		Min.	Typ.	Max.	Units
V _{FM}	Forward Voltage	I _F =150A	T _J =25℃		1.80	2.10	V
			T _J =125℃		1.90		
			T _J =150℃		1.85		
t _{rr}	Reverse Recovery Time	I _F =150A, -diF/dt=1317A/μs(T _J =150℃), V _{rr} =300V, V _{GE} =-15V	T _J =25℃		99		ns
			T _J =125℃		153		
			T _J =150℃		165		
I _{rr}	Peak Reverse Recovery Current		T _J =25℃		39.1		A
			T _J =125℃		64.1		
			T _J =150℃		67.2		
Q _{rr}	Reverse Recovery Charge		T _J =25℃		2.55		μC
			T _J =125℃		6.23		
			T _J =150℃		7.27		



E _{rec}	Reverse Recovery Energy	I _F =150A, -diF/dt=1317A/μs(T _J =150°C), V _{rr} =300V, V _{GE} =-15V	T _J =25°C		0.35		mJ
			T _J =125°C		1.27		
			T _J =150°C		1.52		
R _{θJC}	Thermal Resistance: Junction-to-Case (per Diode)					0.415	°C/W

Module

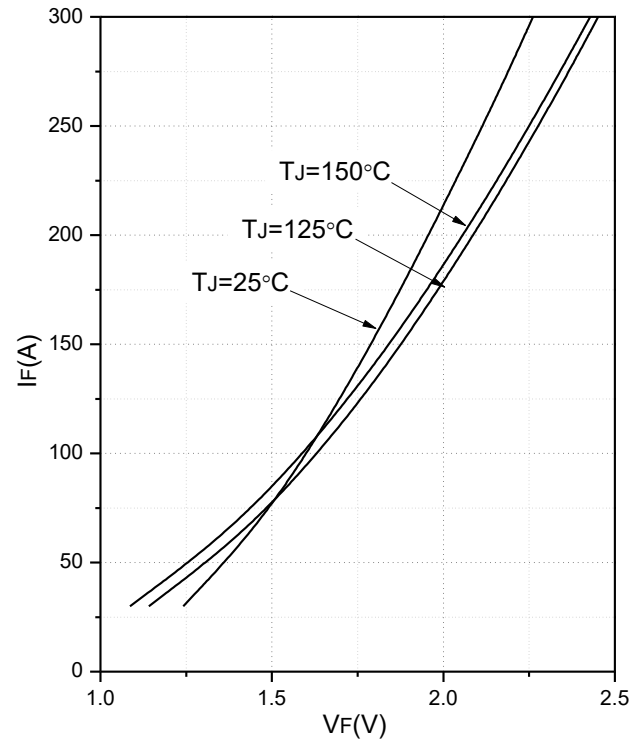
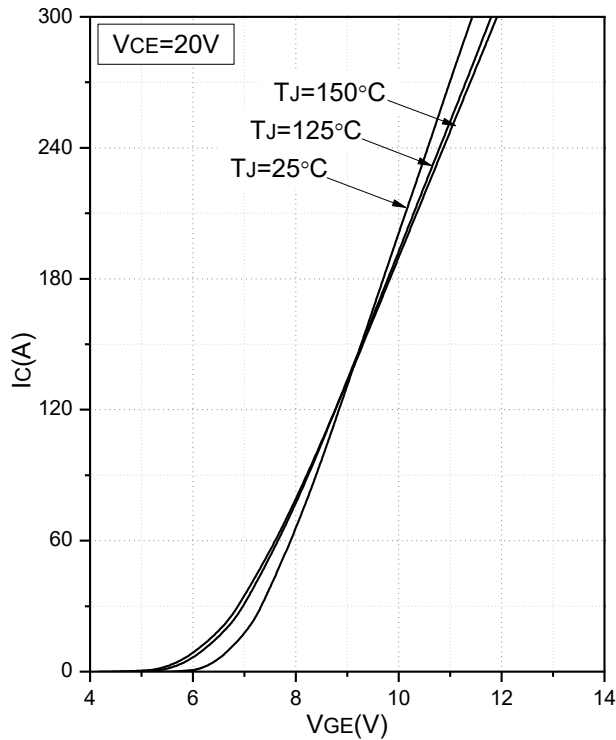
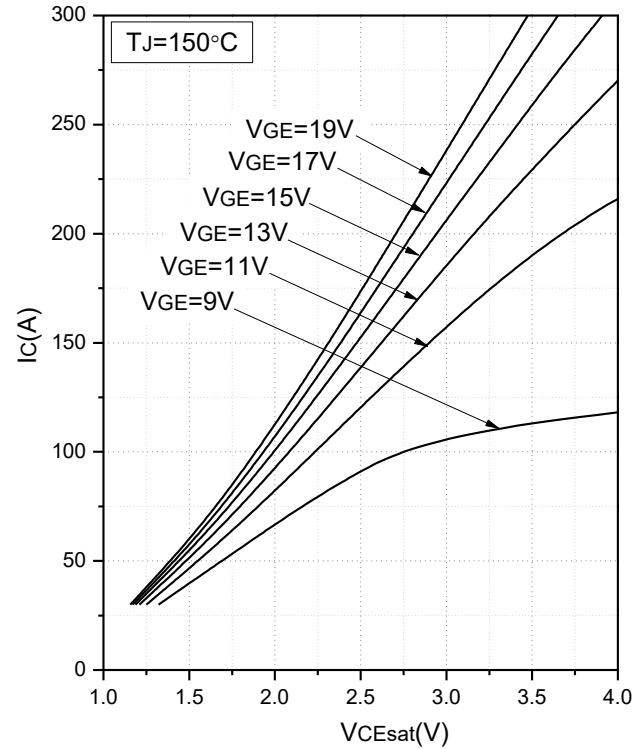
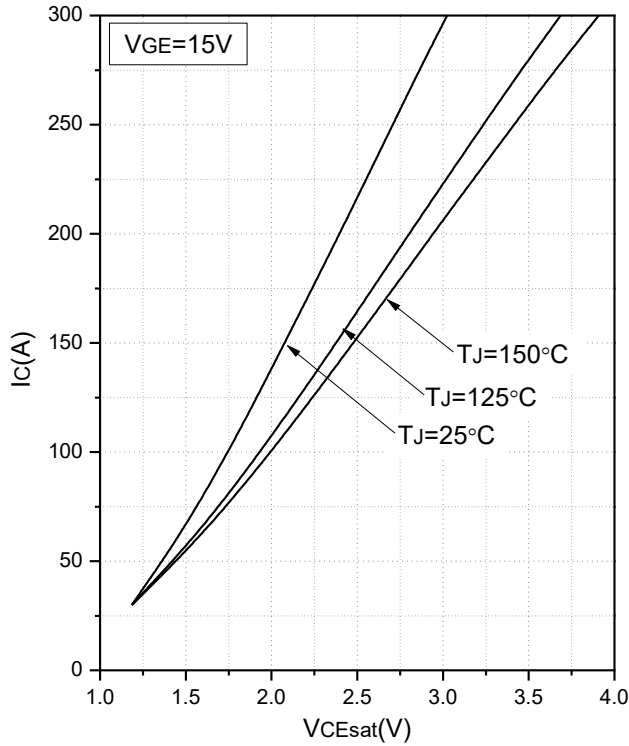
Symbol	Description		Min.	Typ.	Max.	Units
V _{iso}	Isolation Voltage (All Terminals Shorted)	RMS, f=50Hz, 30s	4500			V
T _J	Maximum Junction Temperature				150	℃
T _{JOP}	Maximum Operating Junction Temperature Range		-40		+125	℃
T _{stg}	Storage Temperature		-40		+125	℃
CTI	Comparative Tracking Index		200			
R _{θCS}	Case-to-Sink Thermally (Conductive Grease Applied)				0.07	℃/W
T	Power Terminals Screw:M5		3.0		5.0	N·m
T	Mounting Screw:M6		4.0		6.0	N·m
G	Weight			165		g

Ordering Information Table

Device code

G	K	150	HF	60	T1V	H
①	②	③	④	⑤	⑥	⑦

- ① - IGBT Module
- ② - NPT, Standard IGBT
- ③ - Rated Current (150=150A)
- ④ - Circuit Configuration: HF (Half Bridge)
- ⑤ - Rated Voltage (600=600V)
- ⑥ - Package Type
- ⑦ - Test Level (Pass the Important Reliability Test-Industrial Grade)



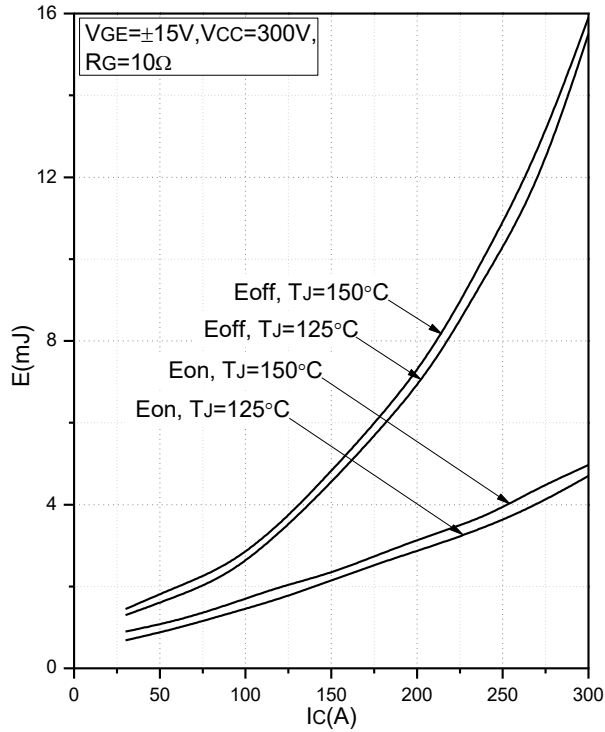


Fig.5 Typical Switching Loss vs. Collector Current

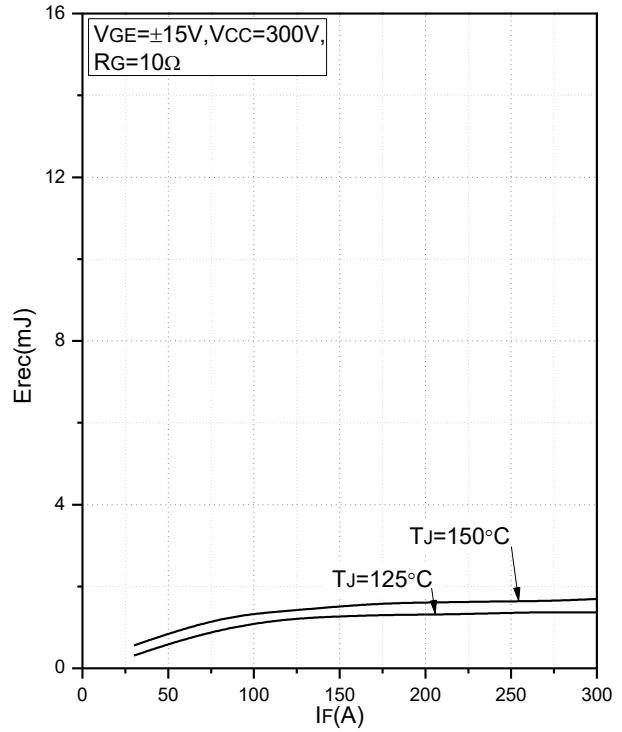


Fig.6 Typical Switching Loss vs. Forward Current

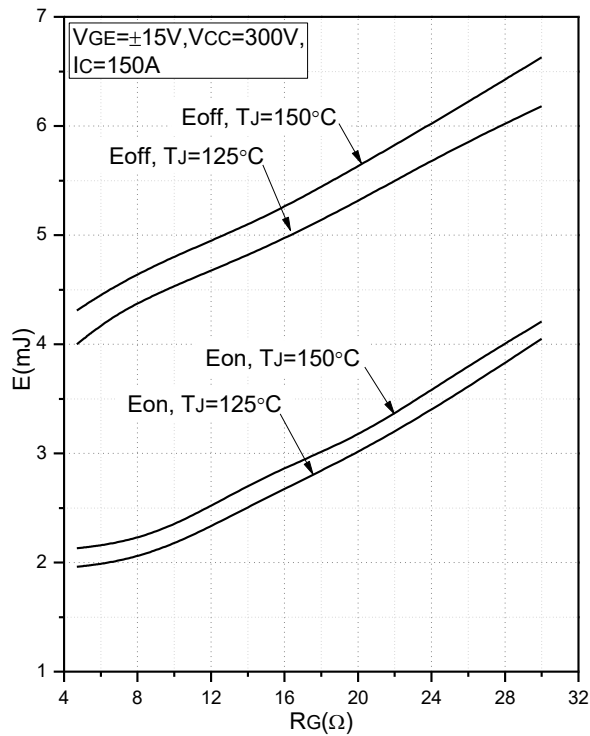


Fig.7 Typical Switching Loss vs. Gate Resistance

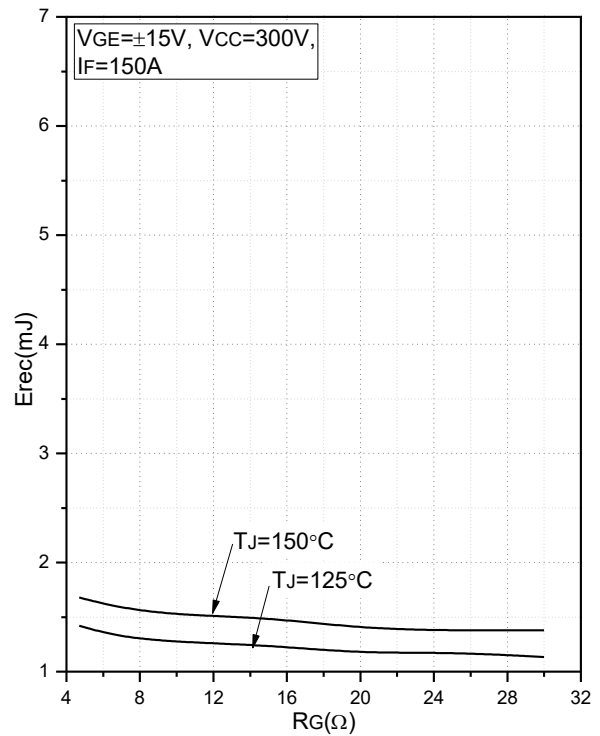


Fig.8 Typical Switching Loss vs. Gate Resistance

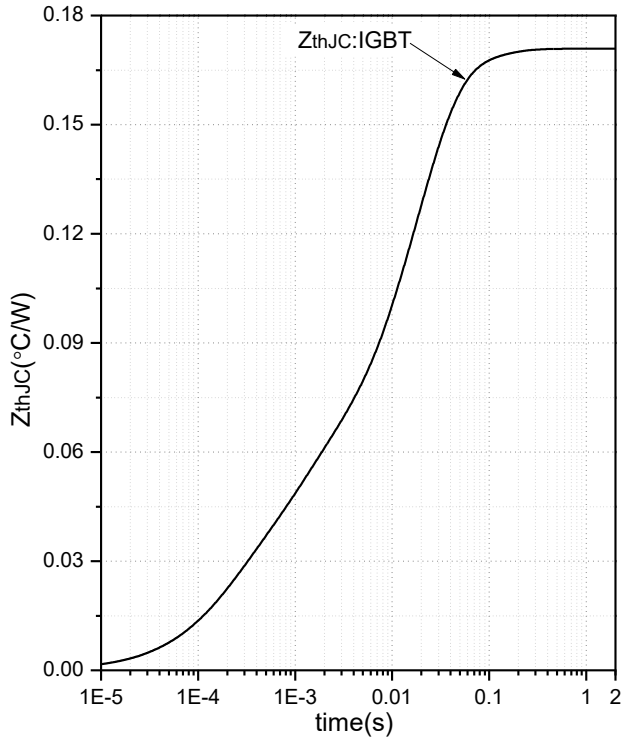


Fig.9 Transient Thermal Impedance of IGBT

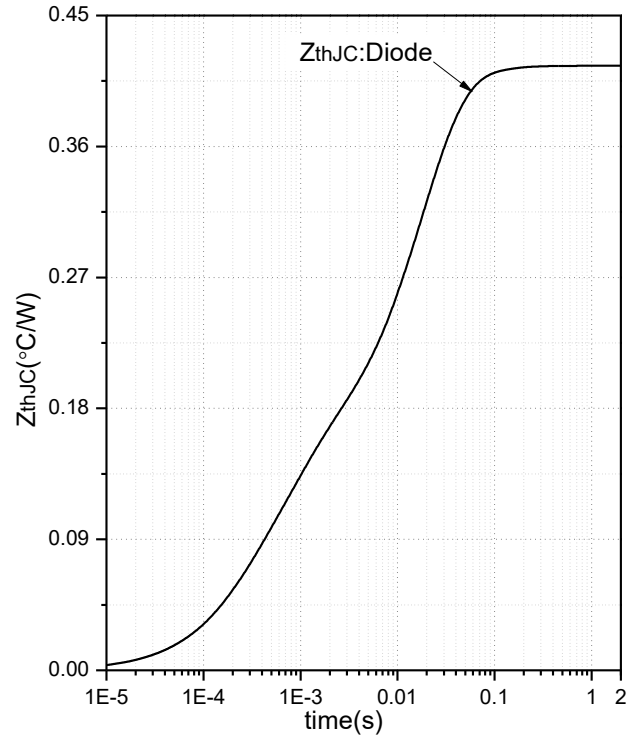


Fig.10 Transient Thermal Impedance of Diode

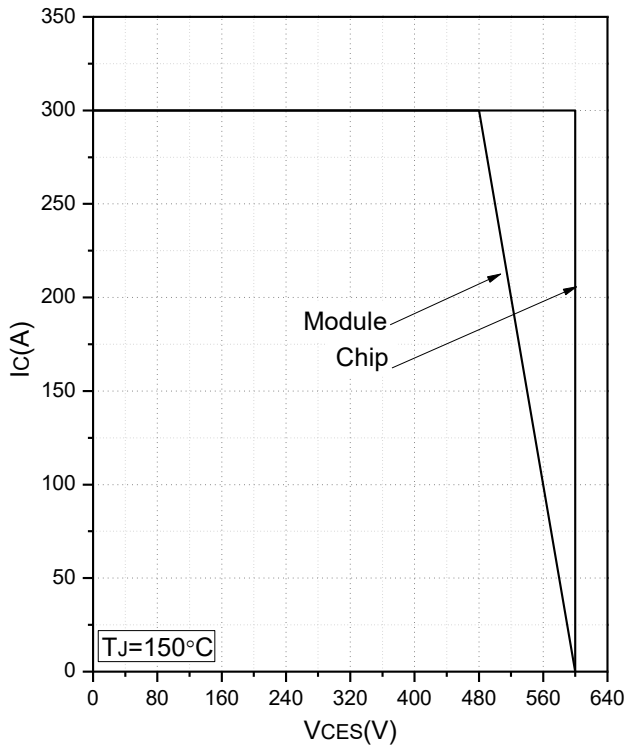


Fig.11 Reverse Bias Safe Operation Area (RBSOA)

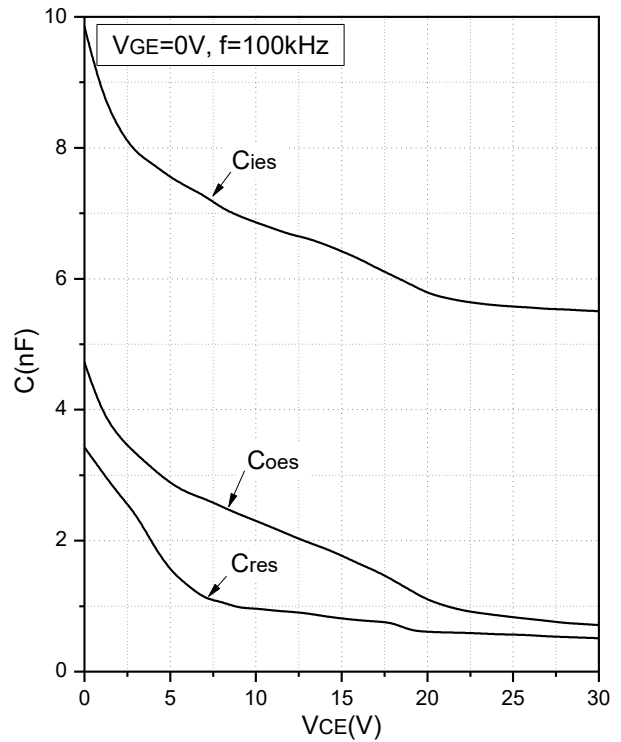


Fig.12 Capacitance Characteristics



Date	Revision	Notes
02/21/2024	01	Initial release
03/01/2024	A	Final Version

Announcements

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The released datasheet would be issued with “REV.” + “alphabet characters”.