



NST06B65RBD FS GEN7 FAST IGBT

1 Features and Benefits

- 650V Trench & Field Stop Gen.7 Fast IGBT technology
- Very low $V_{CE(sat)}$
- High speed switching
- Positive temperature coefficient in $V_{CE(sat)}$
- Very tight parameter distribution
- High ruggedness, temperature stable behavior
- Easy paralleling

2 Application

- White goods
- Inverters
- Motor drives
- Resonant applications

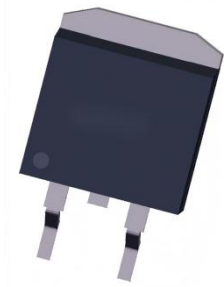
3 Description

Using NSIC's proprietary high density trench gate design and advanced FS (Field Stop) Gen.7 technology, the 650V Trench FS Gen.7 IGBT offers superior conduction and switching performances, and easy parallel operation;

Device information

Device	Package	Device Marking
NST06B65RBD	TO-263	NST06B65RBD

TO-263



4 Selection Guide

Part Number	TYPE	$V_{CE(SAT)}$	V_{CE}	V_{GE}
NST06B65RBD	IGBT	1.5V	650V	5.25V

5 Ordering Guide

Part Number	LOGO		Package
NST06B65RBD		NST06B65RBD XXXXXX	TO-263-2

6 Revision history

Version	Content	Time
V1.0	Create	2024.02.13



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7 Function Pin Description

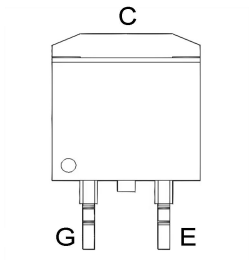


Figure7-1 TO 263-2 Top view

Table7-1 Lead Definitions

Symbol	Description
G	GATE
C	Collector
E	Emitter

8 Product specifications

8.1 Absolute Maximum Ratings

Symbol	Parameter	Value	Units
V_{CES}	Collector-Emitter Voltage	650	V
V_{GES}	Gate- Emitter Voltage	± 30	V
I_c	Collector Current, limited by $T_{j\max}$	6	A
T_j	Operating Junction temperature	-40 to +175	$^{\circ}\text{C}$

8.2 Static Characteristics (TC=25°C unless otherwise noted)

Symbol	Parameter	Conditions	Value			Units
			Min.	Typ.	Max.	
$V_{(BR)CES}$	Collector-Emitter Breakdown Voltage	$V_{GE}=0V, I_{CE}=1\text{mA}$	650	--	--	V
I_{CES}	Collector-Emitter Leakage Current	$V_{GE}=0V, V_{CE}=650V$	--	--	4	μA
$I_{GES(F)}$	Gate to Emitter Forward Leakage	$V_{GE}=+30V, V_{CE}=0V$	--	--	100	nA
$I_{GES(R)}$	Gate to Emitter Reverse Leakage	$V_{GE}=-30V, V_{CE}=0V$	--	--	100	nA
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_c=6A, V_{GE}=15V$	--	1.50	2.00	V
$V_{GE(th)}$	Gate Threshold Voltage	$I_c=1\text{mA}, V_{CE}=V_{GE}$	4.50	5.25	6.00	V

8.3 Electrical Characteristics (TC= 25°C unless otherwise specified)

Symbol	Parameter	Conditions	Value			Units
			Min.	Typ.	Max.	
C_{ies}	Input Capacitance	$V_{CE}=30V, V_{GE}=0V,$ $f=1\text{MHz}$	--	360	--	pF
C_{oes}	Output Capacitance		--	12	--	
C_{res}	Reverse Transfer Capacitance		--	5	--	
Q_g	Total Gate Charge	$V_{CC}=480V, I_c=6A,$ $V_{GE}=15V$	--	20	--	nC
Q_{ge}	Gate to Emitter Charge		--	8	--	nC
Q_{gc}	Gate to Collector Charge		--	10	--	nC

8.4 Switching Characteristics (TC= 25°C unless otherwise specified)

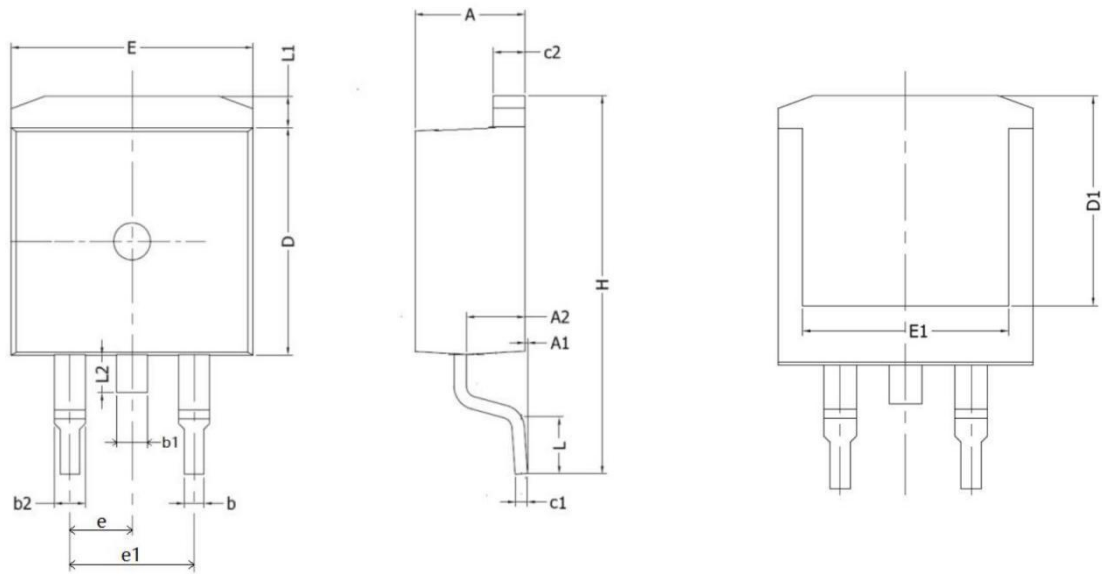
Symbol	Parameter	Conditions	Value			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-on Delay Time	$V_{CE}=400V, I_c=6A,$ $V_{GE}=0/15V, R_g=25\Omega$ Inductive Load	--	24	--	ns
t_r	Rise Time		--	13	--	
$t_{d(OFF)}$	Turn-Off Delay Time		--	105	--	
t_f	Fall Time		--	19	--	
E_{on}	Turn-On Switching Loss		--	0.21	--	mJ
E_{off}	Turn-Off Switching Loss		--	0.10	--	
E_{is}	Total Switching Loss		--	0.31	--	

8.5 Electrical Characteristics of the Diode (TC= 25°C unless otherwise specified)

Symbol	Parameter	Conditions	Rating			Units	
			Min.	Typ.	Max.		
V _{FM}	Diode Forward Voltage	I _F =6A	T _J =25°C	--	2.0	2.6	V
			T _J =175°C	--	2.1	--	
T _{rr}	Reverse Recovery Time	V _{CE} =400V, I _F =6A, R _g =25Ω, T _J =25°C	--	87	--	ns	
I _{RRM}	Diode Peak Reverse Recovery Current		--	1.13	--	A	
Q _{rr}	Reverse Recovery Charge		--	0.05	--	uC	

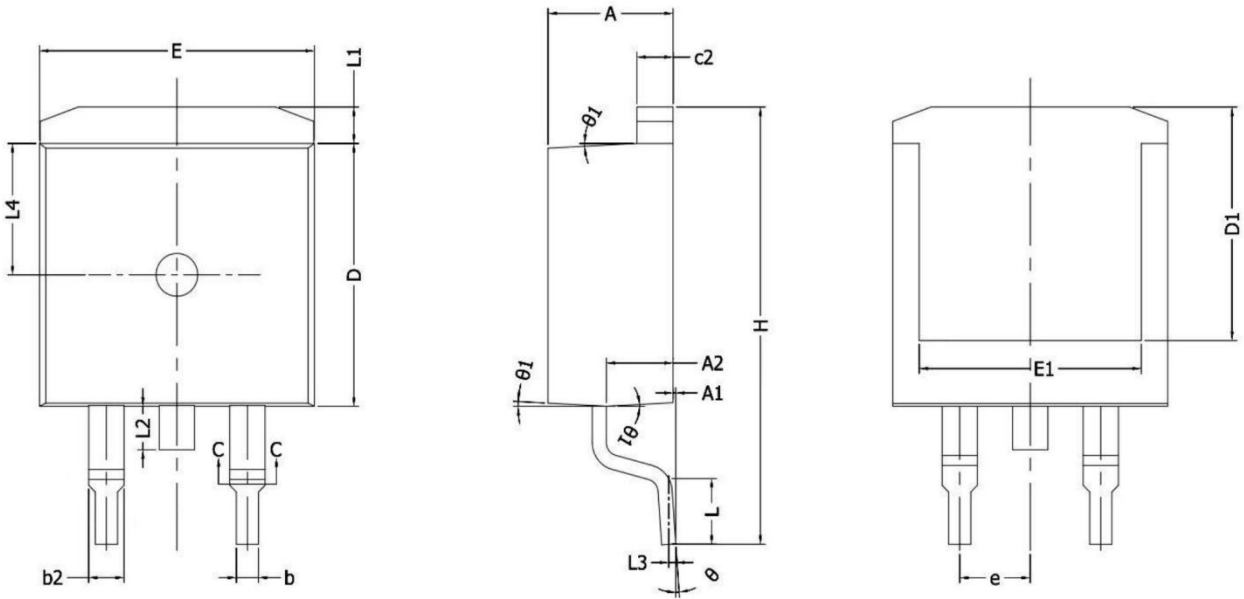
9 Package Information

TO-263-2L-E Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.20	4.60	0.16	0.18
A1	0.00	0.25	0.00	0.01
A2	2.20	2.60	0.09	0.10
b	0.70	0.90	0.03	0.04
b1	1.17	1.37	0.04	0.05
b2	1.20	1.75	0.04	0.07
c1	0.40	0.60	0.01	0.02
c2	1.15	1.40	0.04	0.05
D	9.10	9.30	0.35	0.36
D1	7.63	8.23	0.30	0.32
E	10.05	10.45	0.39	0.41
E1	8.35	8.95	0.32	0.35
e	2.54BSC		0.10BSC	
e1	5.08BSC		0.20BSC	
H	14.61	15.88	0.57	0.62
L	1.78	2.79	0.07	0.0
L1	1.36REF		0.05REF	
L2	1.30REF		0.05REF	

TO-263-2L-P Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.40	4.60	0.17	0.18
A1	0.00	0.25	0.00	0.01
A2	2.20	2.60	0.09	0.10
b	0.76	0.89	0.03	0.04
b2	1.23	1.37	0.05	0.05
C	0.47	0.60	0.02	0.02
c2	1.25	1.35	0.05	0.05
D	9.10	9.30	0.35	0.36
D1	8.00	-	0.31	-
E	9.80	10.00	0.39	0.39
E1	7.80	-	0.31	-
e	2.54BSC		0.10BSC	
H	14.90	15.70	0.59	0.62
L	2.00	2.60	0.08	0.10
L1	1.17	1.40	0.05	0.06
L2	-	1.75	-	0.07
L3	0.25BSC		0.01BSC	
L4	4.60REF		0.18REF	
Θ	0°	8°	0°	8°
Θ1	1°	5°	1°	5°