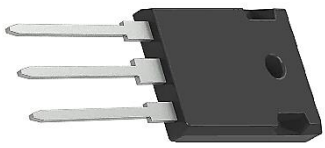
Insulated Gate Bipolar Transistor
650V 80A 156W TO-247

MIG65N80T247

MERITEK

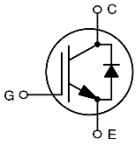
FEATURE

- Trench Gate and Field Stop Processes IGBT
- Low Saturation Collector-to-Emitter Voltage and High Switching Speed
- Positive Saturation Collector-to-Emitter Voltage Temperature Coefficient
- Soft and Fast Recover Antiparallel Diode
- 10μs of Short - Circuit Withstand Time



MECHANICAL DATA

- Case: TO-247 Package
- Terminals: Solderable per MIL-STD-750, Method 2026



RoHS

MAXIMUM RATINGS

Parameter		Symbol	Value	Unit
Collector-to-Emitter Breakdown Voltage		V_{CES}	650	V
Gate-to-Emitter Voltage		V_{GE}	±30	V
Collector Current – Continuous	T_C=25°C	I_C	80	A
	T_C=100°C		40	
Collector Current – Pulsed		I_{CM}	120	A
Maximum Power Dissipation	T_C=25°C	P_D	156	W
	T_C=100°C		63	
Thermal Resistance Junction to Ambient		$R_{\theta JA}$	40	°C/W
Thermal Resistance Junction to Case For IGBT		$R_{\theta JC}$	0.8	°C/W
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-55 to 150	°C

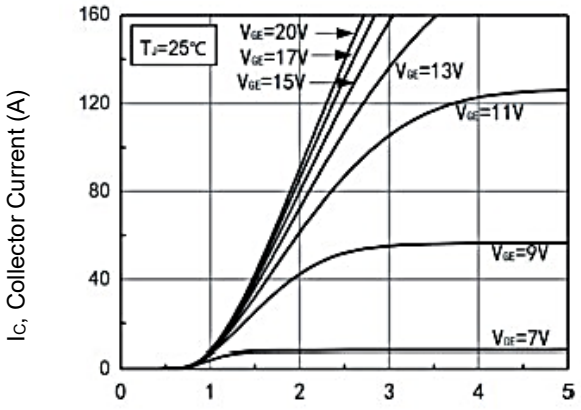
ELECTRICAL CHARACTERISTICS

Static Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Collector-Emitter Breakdown Voltage	V_{GE}=0V, I_C=1mA	BV_{CES}	650	--	--	V
Zero Gate Voltage Collector Current	V_{CS}=650V, V_{GE}=0V	I_{CES}	--	--	1	μA
Gate-Body Leakage Current, Forward	V_{GE}=30V, V_{CS}=0V	I_{GESF}	--	--	200	nA
Gate-Body Leakage Current, Reverse	V_{GE}=-30V, V_{CS}=0V	I_{GESR}	--	--	-200	nA
Collector-Emitter Saturation Voltage	V_{GE}=15V, I_C=40A	$V_{CE(SAT)}$	--	1.5	2	V
Gate Threshold Voltage	V_{GE}=V_{DS}, I_C=1mA	$V_{GE(th)}$	4.2	--	6.8	V
Diode Forward Voltage	I_F=40A	V_F	--	1.6	2.2	V
Dynamic Characteristics	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Total Gate Charge	V_{CC}=480V, V_{GE}=15V, I_C=30A	Q_g	--	126	--	nC
Gate-Emitter Charge		Q_{ge}	--	31	--	
Gate-Collector Charge		Q_{gc}	--	38	--	
Input Capacitance	V_{CE}=25V, V_{GE}=0V, F=1MHz	C_{ies}	--	4712	--	pF
Output Capacitance		C_{oes}	--	151	--	
Reverse Transfer Capacitance		C_{res}	--	43	--	
Switching Characteristics	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Turn-On Delay Time	V_{CC}=300V, V_{GE}=15V, R_G=10Ω I_C=30A, T_C=25°C, Inductive Load	$T_{d(on)}$	--	110	--	ns
Rise Time		T_r	--	98	--	
Turn-Off Delay Time		$T_{d(off)}$	--	81	--	
Fall Time		T_f	--	282	--	
Turn-On Switching Loss		E_{on}	--	0.85	--	mJ
Turn-Off Switching Loss		E_{off}	--	0.8	--	
Reverse Recovery Time	I_F =40A, di_F/dt = 100A/μs	t_{rr}	--	50	--	ns
Reverse Recovery Charge		Q_{rr}	--	260	--	nC
Peak Reverse Recovery Current		I_{rr}	--	8	--	A

Note: 1. Tc = 25 C unless otherwise noted. 2. Pulse width < 300μs, Duty cycle < 2%

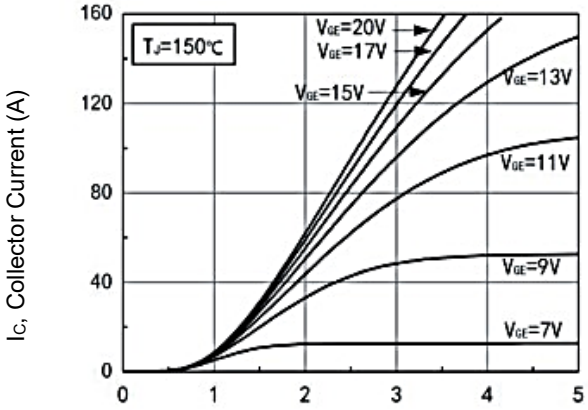
CHARACTERISTIC CURVES

Output Characteristics



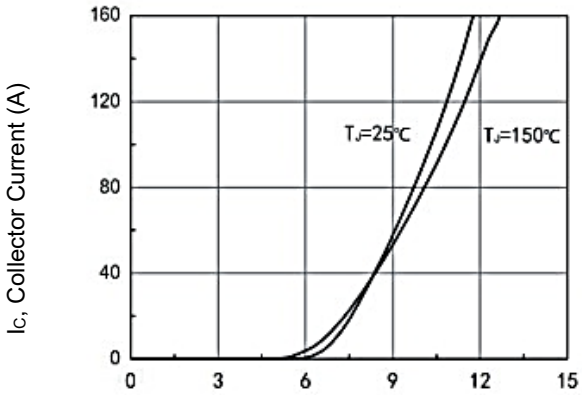
VCE, Collector-to-Emitter Voltage (V)

Output Characteristics



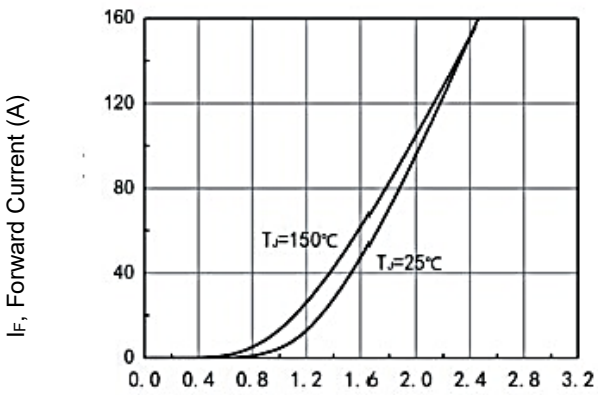
VCE, Collector-to-Emitter Voltage (V)

Transfer Characteristics



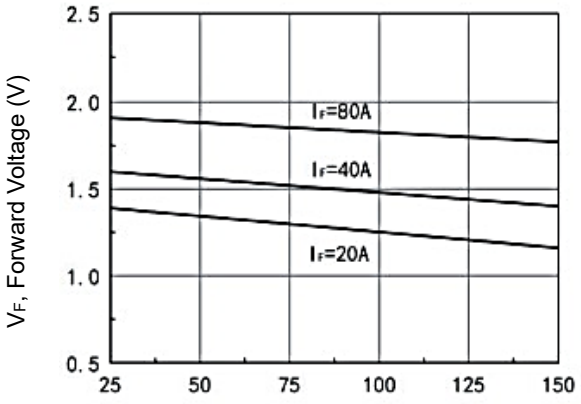
VGE, Gate-to-Emitter Voltage (V)

Diode Forward Characteristics



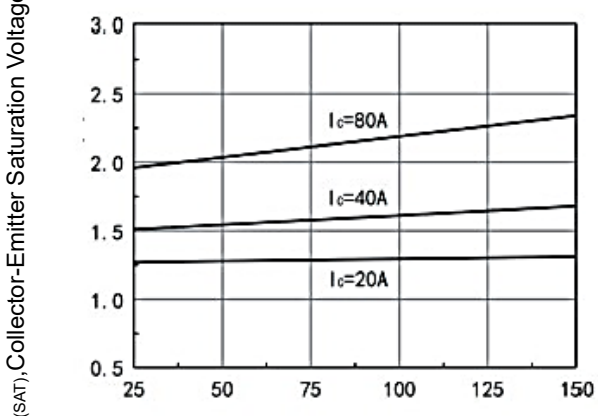
VF, Forward Voltage (V)

Forward Voltage Variation



Temperature(°C)

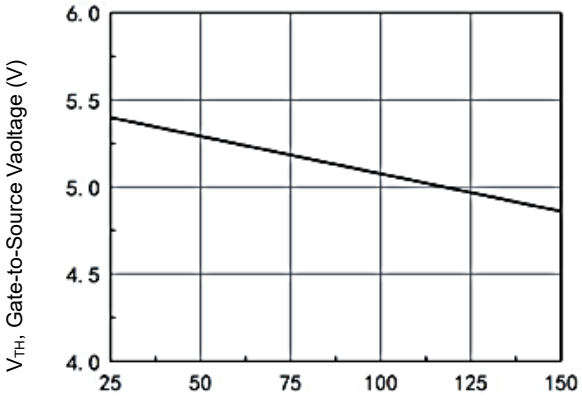
Collector-Emitter Saturation Voltage



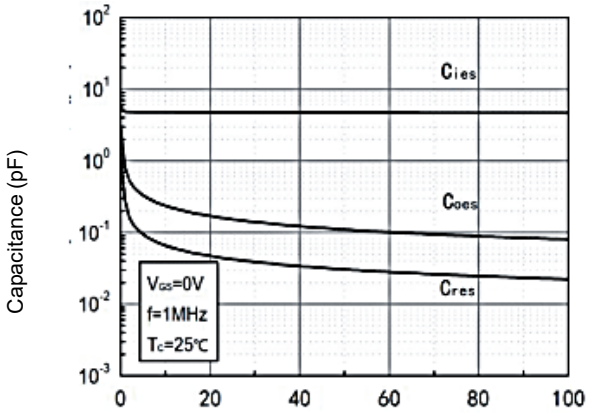
Temperature(°C)

CHARACTERISTIC CURVES

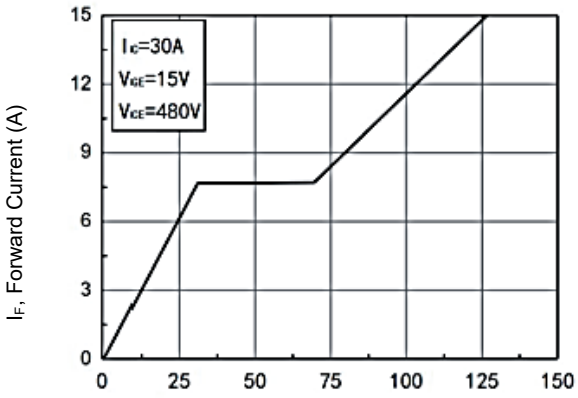
Gate Threshold Voltage Variation



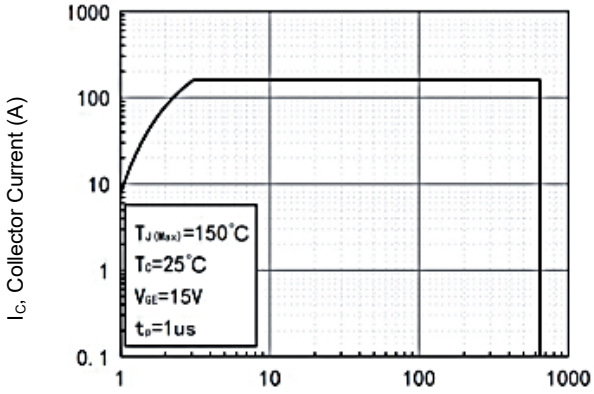
Capacitance Characteristics



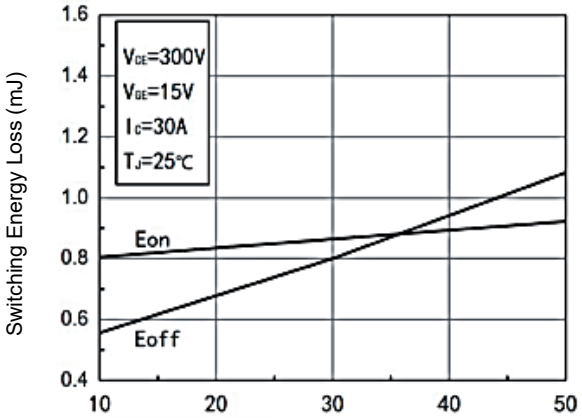
Gate-Charge Characteristics



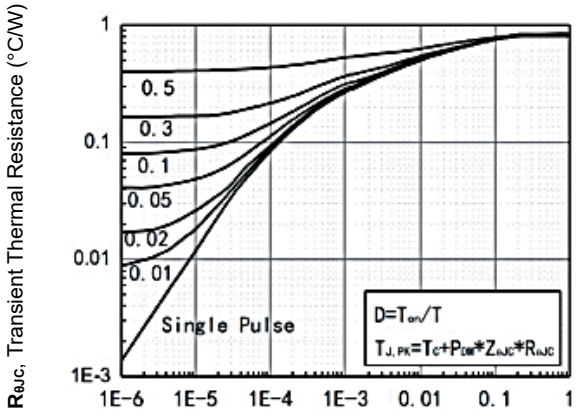
Forward Bias Safe Operating Area



Switching Energy Loss vs Gate Resistances



Transient Thermal Resistance



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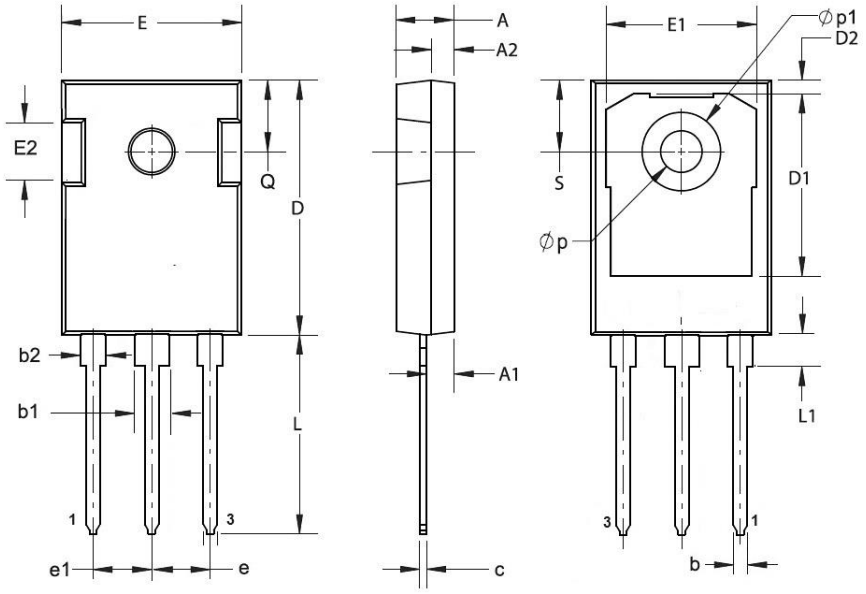
MIG65N80T247

MERITEK

DIMENSIONS

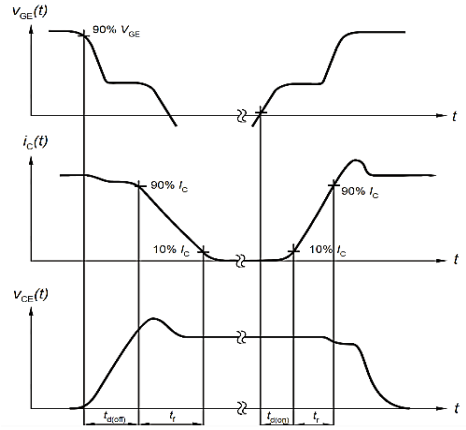
TO-247	Min	Max
A	4.60	5.20
A1	1.90	2.16
A2	2.20	2.60
b	0.90	1.40
b1	2.80	3.35
b2	1.75	2.15
c	0.50	0.70
D	20.60	21.30
D1	16.35	16.75
e	5.45	
e1	5.45	
E	15.50	16.10
E1	13.10	13.40
E2	3.80	5.30
L	19.00	20.50
L1	3.90	4.60
p	3.30	3.70
p1	6.90	7.30
Q	5.20	6.00
S	5.20	6.00

Note: 1: Gate(G), 2: Collector(C), 3: Emitter (E).

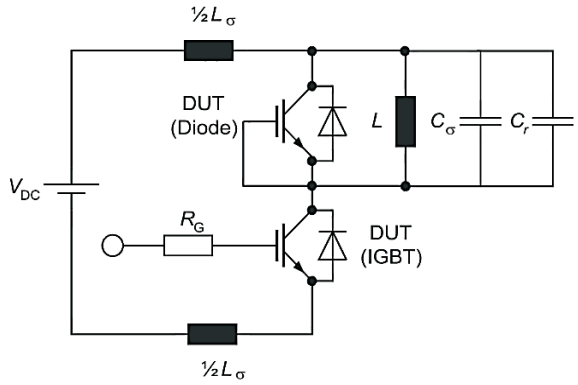


TEST CONDITION

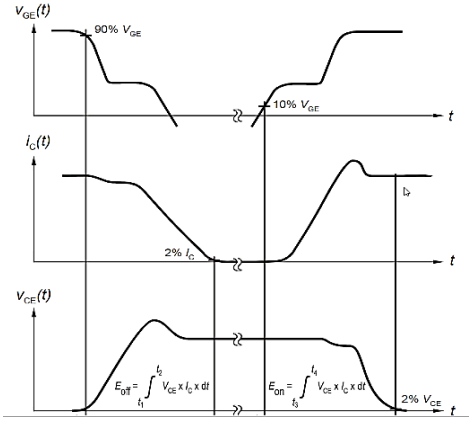
Switching Time Waveform



Switching Test Circuit



Switching Losses Waveform



Diode Switching Characteristics