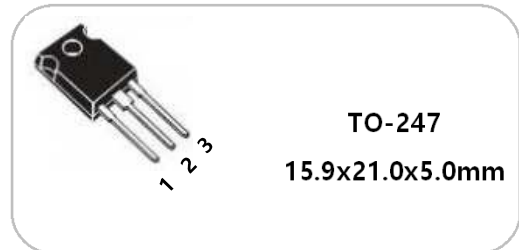


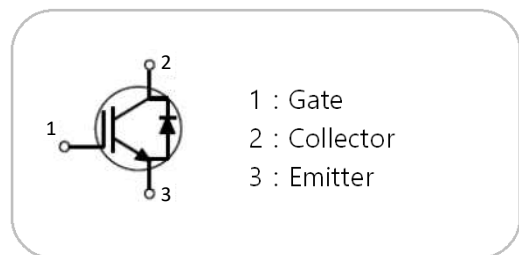

General description

Symbol	Value
V_{CES} @ $T_C=25^\circ\text{C}$	Min 1200V
I_C @ $T_C=100^\circ\text{C}$	40A
$V_{CE(sat)}$ @ $T_C=25^\circ\text{C}$	Typ 1.9V


Package


Features

- Low saturation pressure
- Fast switching speed
- Quick recovery diode



Applications

- DC-AC converters
- Power supplies
- Inverter
- Industrial UPS


Maximum ratings ($T_j = 25^\circ\text{C}$)

Parameter	Symbol	Test condition	Value	Unit
Collector – emitter volatge	V_{CES}	$T_C=25^\circ\text{C}$	1200	V
Gate – emitter voltage	V_{GES}	-	± 20	V
DC collector current	I_C	$T_C=25^\circ\text{C}$	80	A
		$T_C=100^\circ\text{C}$	40	A
Pulsed collector current	$I_{C(pulse)}$	Pulse width t_p limited by $T_{j,max}$	160	A
Diode forward current	I_F	$T_C=25^\circ\text{C}$	80	A
		$T_C=100^\circ\text{C}$	40	
Power dissipation	P_D	$T_C=25^\circ\text{C}$	275	W
Operating and storage temperature range	T_{j}, T_{stg}	-	-55 to 150	$^\circ\text{C}$




Electrical characteristics ($T_j = 25^\circ\text{C}$)

Parameter	Symbol	Test condition	Value			Unit
			Min	Typ	Max	
Collector - emitter breakdown voltage	$V_{(BR)CES}$	$I_C=250\mu\text{A}, V_{GE}=0\text{V}$	1200	-	-	V
Zero gate voltage collector current	I_{CES}	$V_{CE}=1200\text{V}, V_{GE}=0\text{V}$	-	-	1.0	mA
Gate - emitter leakage current	I_{GES}	$V_{GE}=\pm 20\text{V}$	-	-	± 250	nA
Collector - emitter saturation voltage	$V_{CE(sat)}$	$I_C=40\text{A}, V_{GE}=15\text{V}$	-	1.9	2.4	V
Gate - emitter threshold voltage	$V_{GE(th)}$	$I_C=250\mu\text{A}, V_{CE}=V_{GE}$	4.5	6.0	7.0	V
Input capacitance	C_{ies}	$V_{CE}=25\text{V}, V_{GE}=0\text{V}, f=1\text{MHz}$	-	3850	-	pF
Output capacitance	C_{oes}		-	180	-	
Reverse transfer capacitance	C_{res}		-	100	-	
Total gate charge	Q_G	$V_{CE}=600\text{V}, V_{GE}=15\text{V}, I_C=40\text{A}$	-	250	-	nC
Gate - emitter charge	Q_{GE}		-	35	-	
Gate - collector charge	Q_{GC}		-	150	-	
Turn on delay time	$t_{d(on)}$	$V_{CE}=600\text{V}, V_{GE}=15\text{V}, I_C=40\text{A}, R_G=10\Omega, T_a=25^\circ\text{C}$	-	65.0	-	ns
Rise time	t_r		-	58.0	-	
Turn off delay time	$t_{d(off)}$		-	270.0	-	
Fall time	t_f		-	35.0	-	
Turn-on energy	E_{on}		-	4.0	-	mJ
Turn-off energy	E_{off}		-	1.5	-	
Total switching energy	E_{ts}		-	5.0	-	

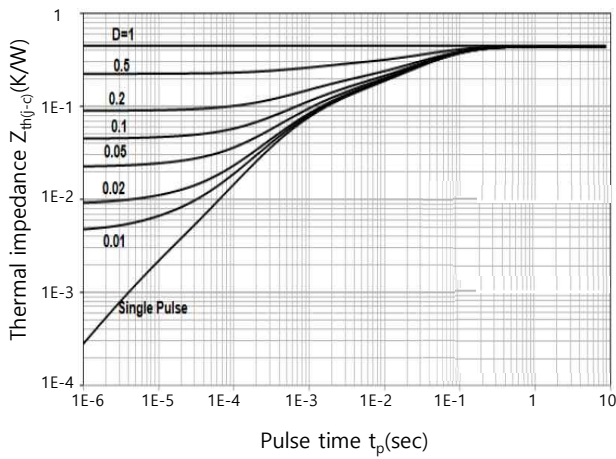
Body diode(source – drain) electrical characteristics (T_j = 25°C)

Parameter	Symbol	Test Condition	Value			Unit
			Min	Typ	Max	
Forward voltage	V _F	I _F =40A	-	2.2	-	V
Reverse recovery time	t _{rr}	I _F =40A, di/dt=200A/us	-	90.0	-	ns
Reverse recovery charge	Q _{rr}		-	340.0	-	nC
Peak reverse recovery current	I _{rrm}		-	7.5	-	A

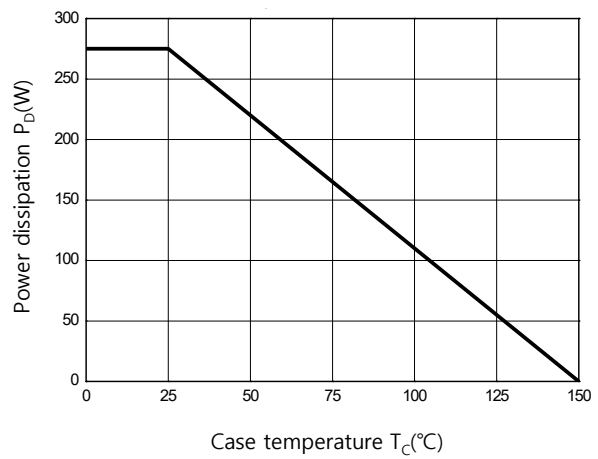
Thermal characteristics (T_j = 25°C)

Symbol	Parameter	Typ	Max	Unit
R _{th(j-c)}	Junction to case	-	0.45	°C/W

t_p – Z_{th(j-c)} Characteristics

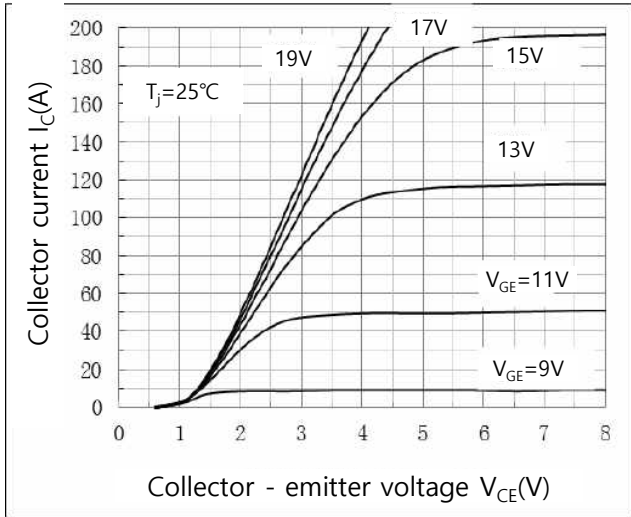


T_C – P_D Characteristics

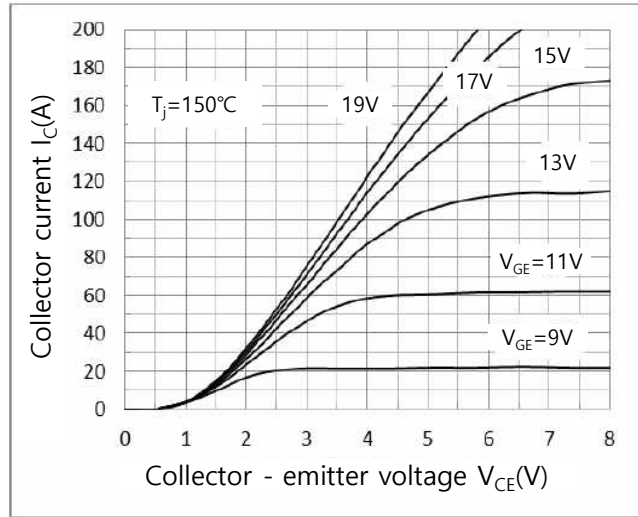


Typical electrical characteristics curves ($T_j = 25^\circ\text{C}$)

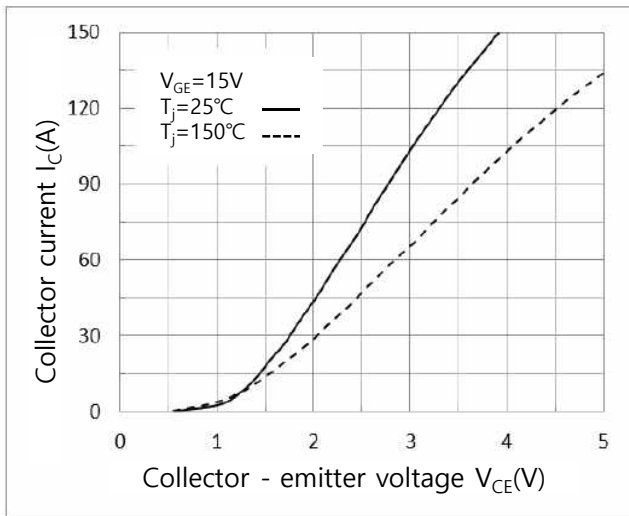
$V_{CE} - I_C$ Characteristics, $T_j=25^\circ\text{C}$



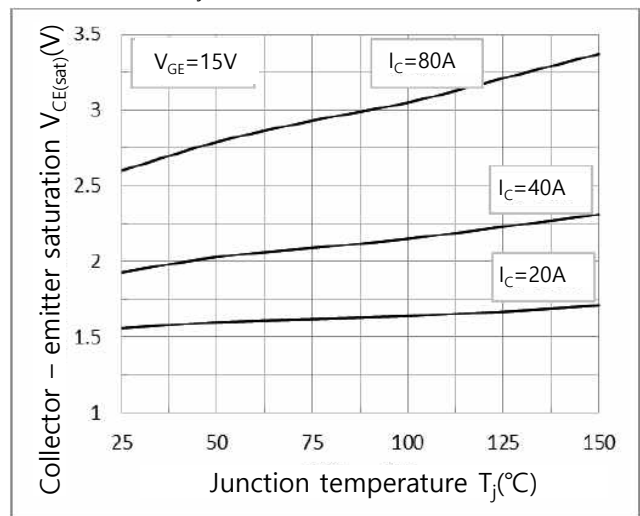
$V_{CE} - I_C$ Characteristics, $T_j=150^\circ\text{C}$



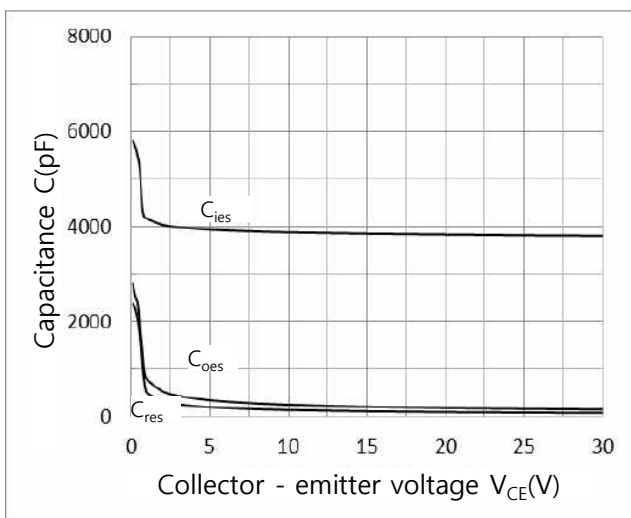
$V_{CE} - I_C$ Characteristics



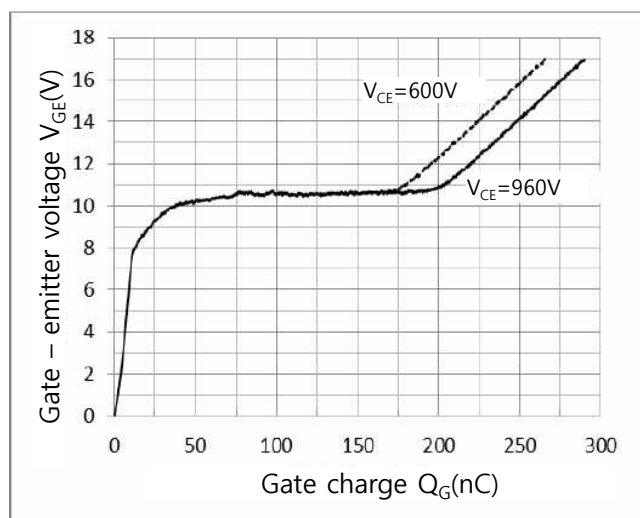
$T_j - V_{CE(sat)}$ Characteristics



$V_{CE} - C$ Characteristics

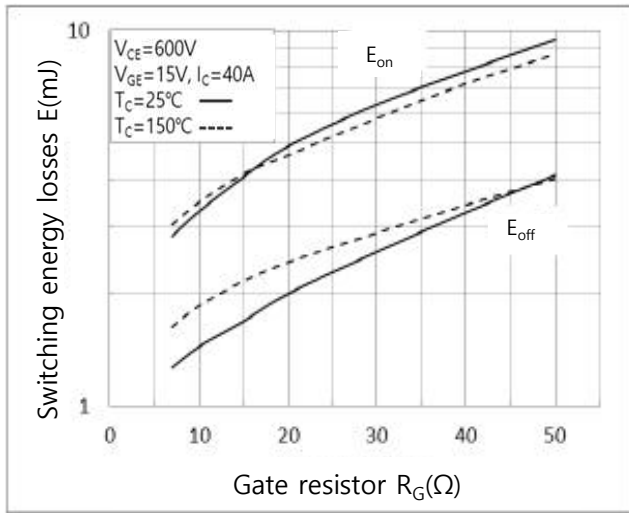


$Q_G - V_{GE}$ Characteristics

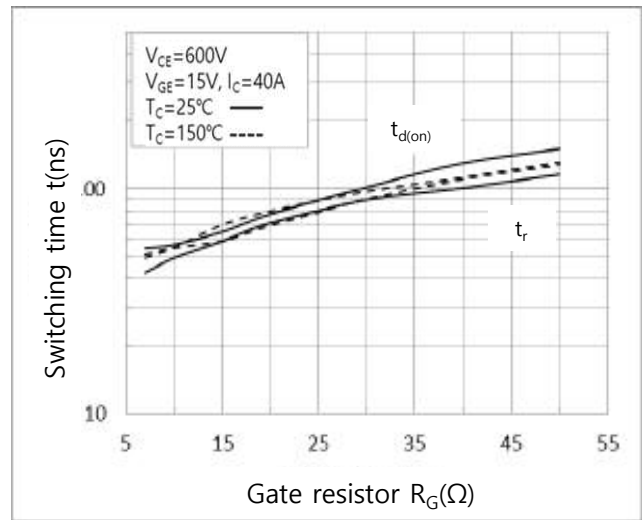


Typical electrical characteristics curves ($T_j = 25^\circ\text{C}$)

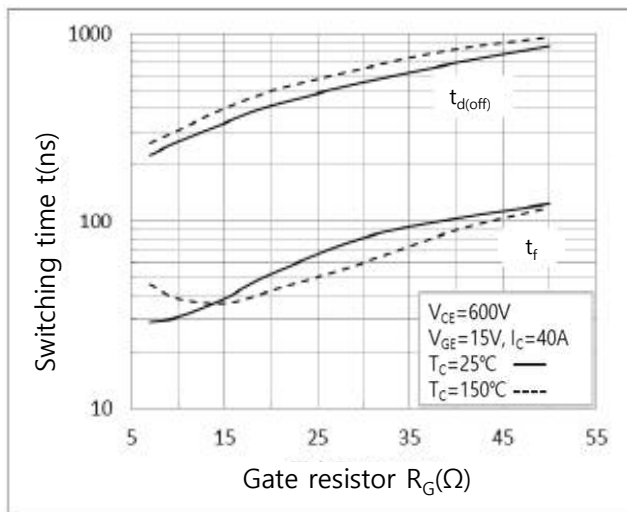
$R_G - E$ Characteristics



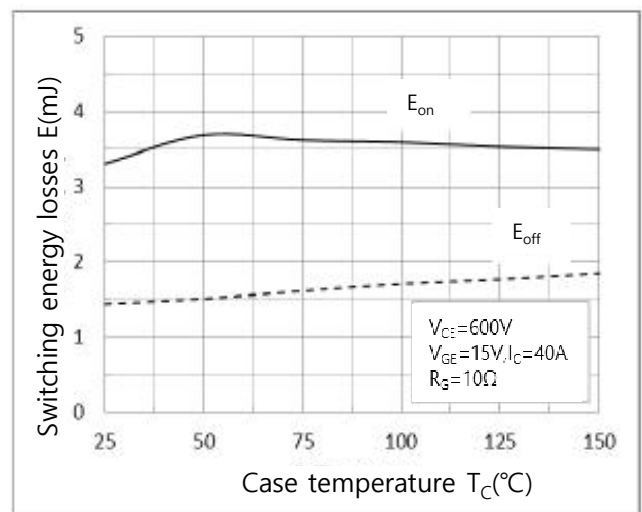
$R_G - t$ Characteristics



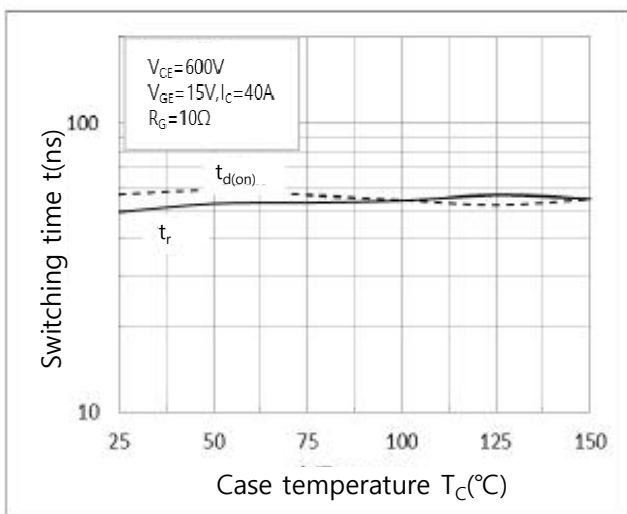
$R_G - t$ Characteristics



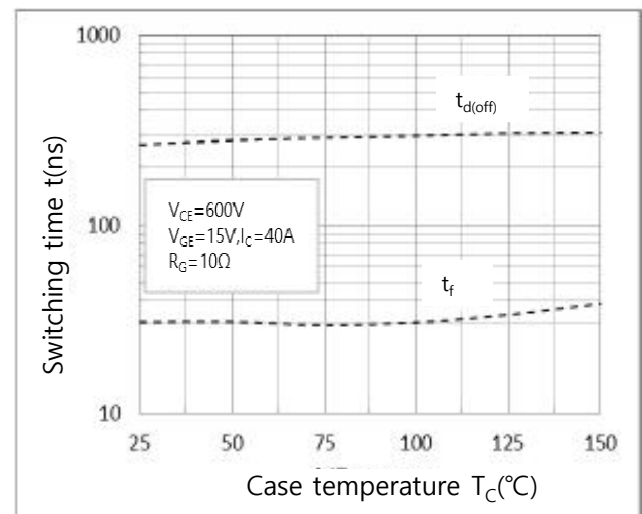
$T_C - E$ Characteristics



$T_C - t$ Characteristics

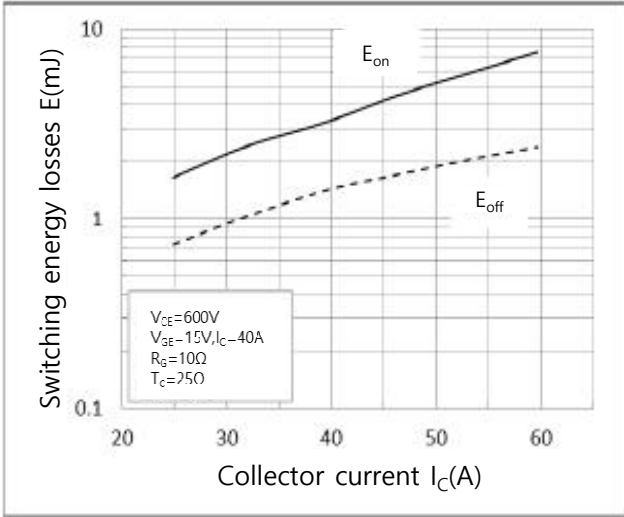


$T_C - t$ Characteristics

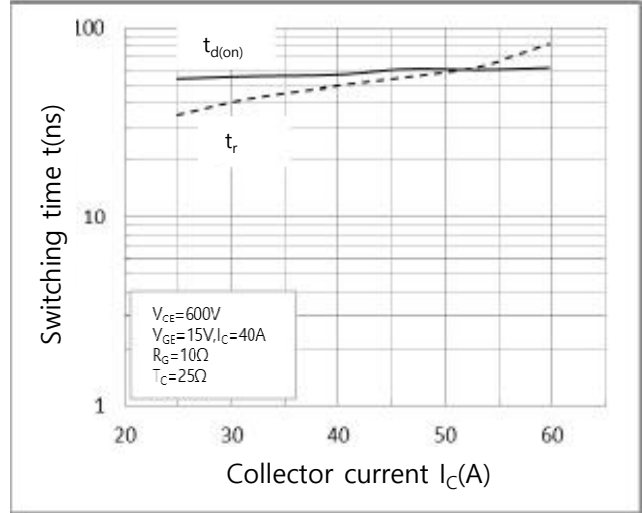


Typical electrical characteristics curves ($T_j = 25^\circ\text{C}$)

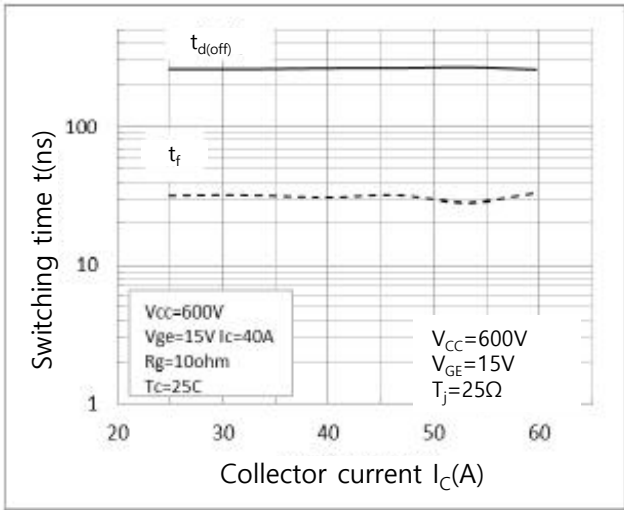
$I_C - E$ Characteristics



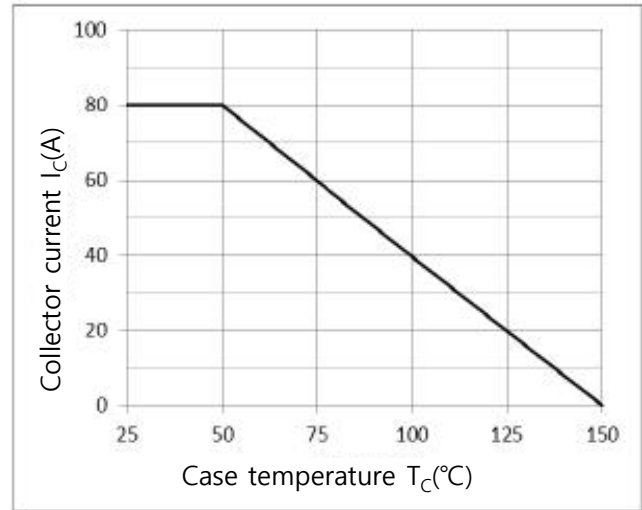
$I_C - t$ Characteristics



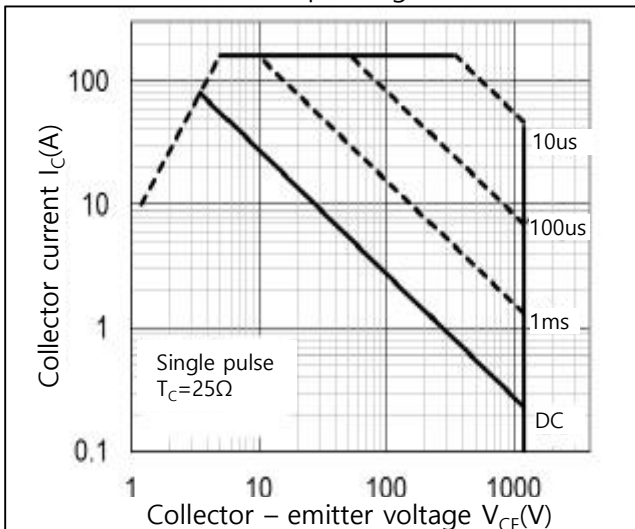
$I_C - t$ Characteristics



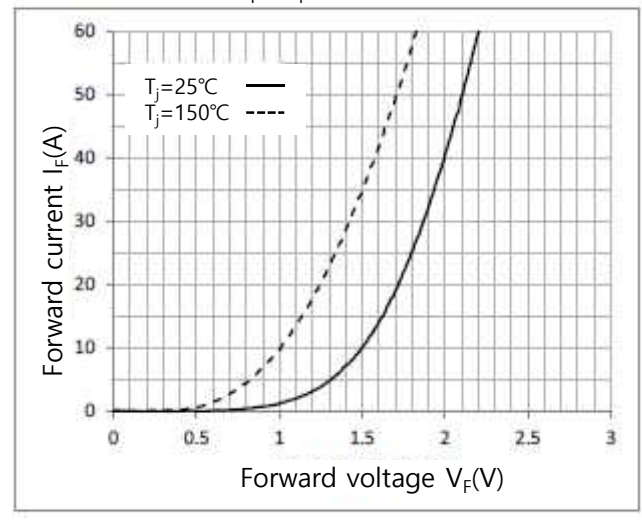
$T_C - I_C$ Characteristics



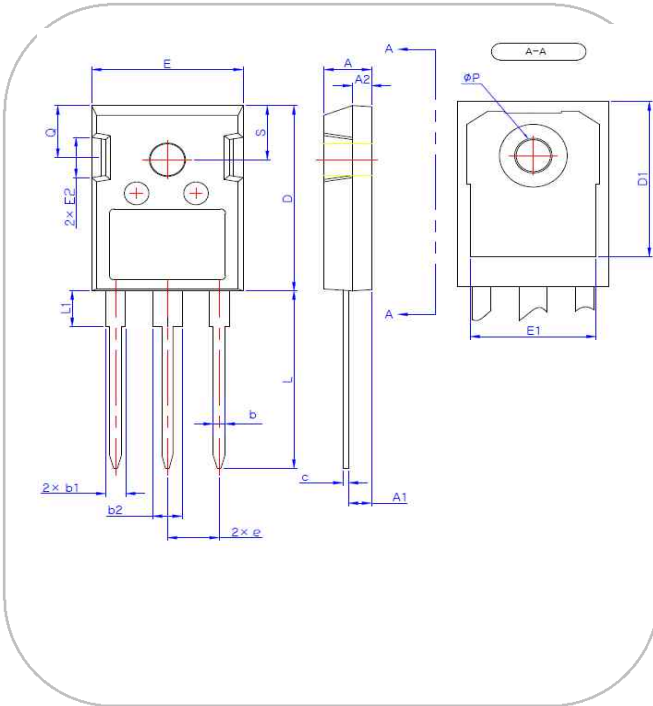
Safe operating area



$V_F - I_F$ Characteristics

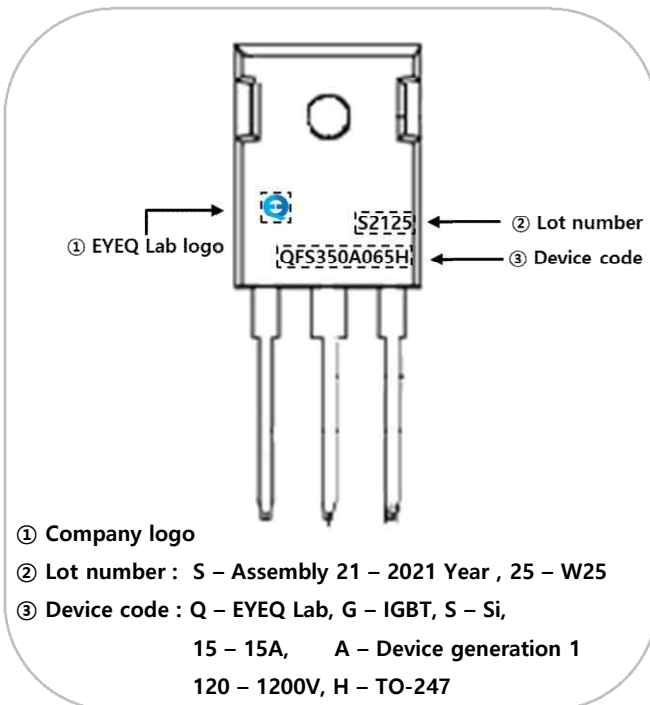


Package dimensions (TO-247)



Symbol	Min	Nom	Max
A	4.80	5.00	5.20
A1	2.29	2.36	2.54
A2	1.90	2.00	2.10
b	1.10	1.20	1.30
b1	1.91	2.11	2.20
b2	2.92	3.10	3.20
c	0.50	0.60	0.70
D	20.80	21.07	21.34
D1	17.43	17.63	17.83
E	15.75	15.94	16.13
E1	13.06	13.26	13.46
E2	4.32	4.58	4.83
e	5.45 BSC		
L	19.85	20.00	20.25
L1	-	-	4.49
ΦP	3.55	3.60	3.65
Q	5.59	5.89	6.19
S	6.15 BSC		

Marking information



- ① Company logo
- ② Lot number : S – Assembly 21 – 2021 Year , 25 – W25
- ③ Device code : Q – EYEQ Lab, G – IGBT, S – Si,
15 – 15A, A – Device generation 1
120 – 1200V, H – TO-247