General description

Symbol	Value
V_{DSS} @ T_C=25℃	Min 650V
V_{TDSS} @ T_C=25℃	Min 800V
I_D @ T_C=25℃	34.5A
$R_{DS(on)}$	Typ 50mΩ
Q_R	Typ 130nC
$Q_{G(Total)}$	Typ 18nC

Package

TO-247
15.9x21.0x5.0mm

1 : Gate
2 : Drain
3 : Source

Features

- Ultra-low reverse recovery charge
- High blocking voltage
- Low on-resistance
- Very low QRR
- Reduced crossover loss

Applications

- Broad industrial
- PV inverter
- Servo motor
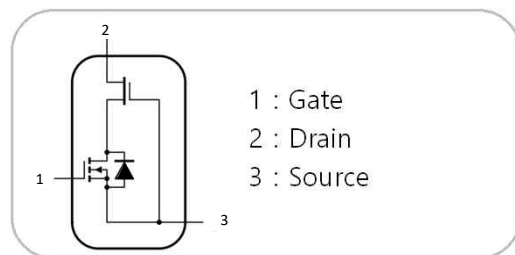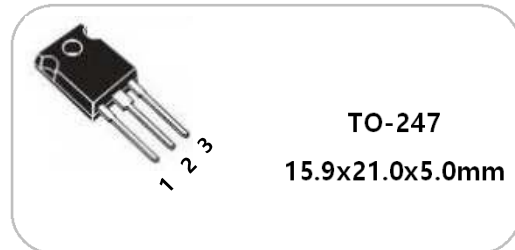
Maximum ratings (T_C = 25℃)

Parameter	Symbol	Test condition	Value	Unit
Drain - source voltage	V_{DSS}	-	650	V
Transient drain to source voltage	$V_{(TH)DSS}$	-	800	V
Gate - source voltage	V_{GS}	-	±20	V
Continuous drain current	I_D	V_{GS}=10V , T_c=25℃	34.5	A
		V_{GS}=10V , T_c=100℃	23	A
Pulsed drain current	$I_{D(pulse)}$	Pulse width 10us	150	A
Power dissipation	P_D	T_C=25℃	135	W
Operating and storage temperature range	$T_{j,}T_{stg}$	-	-55 to 175	℃

Electrical characteristics (T_C = 25℃)

Parameter	Symbol	Test condition	Value			Unit
			Min	Typ	Max	
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS}=0V	650	-	-	V
Zero gate voltage drain current	I_{DSS}	V_{DS}=650V, V_{GS}=0, T_C=25℃	-	5	30	uA
		V_{DS}=650V, V_{GS}=0, T_C=175℃	-	30	-	uA
Gate-source leakage current	I_{GSS}	V_{GS}=20V, V_{DS}=0V	-	-	200	nA
		V_{GS}=-20V, V_{DS}=0V	-	-	200	nA
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=1mA	3.4	4	4.6	V
Drain-source on-state resistance	$R_{DS(on)}$	V_{GS}=10V, I_D=25A	-	50	60	mΩ
Gate resistance	R_G	f=1MHz	-	2.3	-	Ω
Input capacitance	C_{iss}	V_{GS}=0V, V_{DS}=400V, f =1MHz	-	1000	-	pF
Output capacitance	C_{oss}		-	130	-	
Reverse transfer capacitance	C_{rss}		-	10	-	
Effective output capacitance, energy related	$C_{o(er)}$	V_{GS}=0V, V_{DS}=0 to 400V	-	190	-	pF
Gate-source charge	Q_{GS}	V_{DS}=400V, V_{GS}=10V, I_D=25A	-	6	-	nC
Gate-drain charge	Q_{GD}		-	5	-	
Total gate charge	Q_G		-	16	24	
Turn on delay time	$t_{d(on)}$	V_{DS}=400V, V_{GS}=12V, I_D=22A, R_G= 40Ω	-	60	-	ns
Rise time	t_r		-	12	-	
Turn off delay time	$t_{d(off)}$		-	90	-	
Fall time	t_f		-	13	-	

Body diode(source – drain) electrical characteristics (T_C = 25℃)

Parameter	Symbol	Test condition	Value			Unit
			Min	Typ	Max	
Source-drain voltage	V_{SD}	V_{GS}=0V, I_S=25A	-	2.0	-	V
Continuous diode Forward current	I_S	V_{GS}=0V, T_C=25℃,	-	-	34.5	A
Reverse recovery time	T_{rr}	V_{GS}=0V, I_S=25A, V_{DS}=400V, di/dt=1000A/μs	-	54	-	ns
Reverse recovery charge	Q_{rr}		-	125	-	nC

Thermal characteristics (T_C = 25℃)

Symbol	Parameter	Typ	Max	Unit
$R_{th(j-c)}$	Junction to case	1.1	-	℃/W

t_p – Z_{thjc} Characteristics
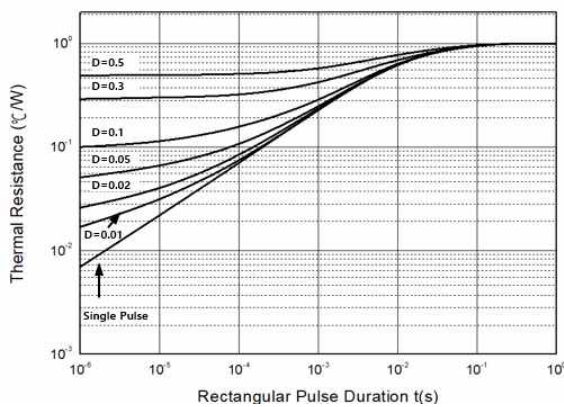
T_C – P_{tot} Characteristics
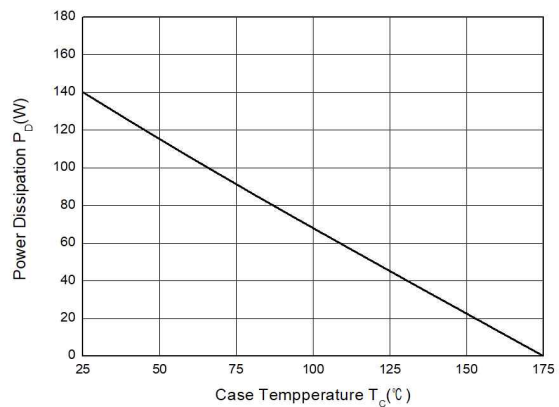
Typical electrical characteristics curves (T$_C$ = 25℃)

V$_{DS}$ – I$_D$ Characteristics, T$_j$=25℃
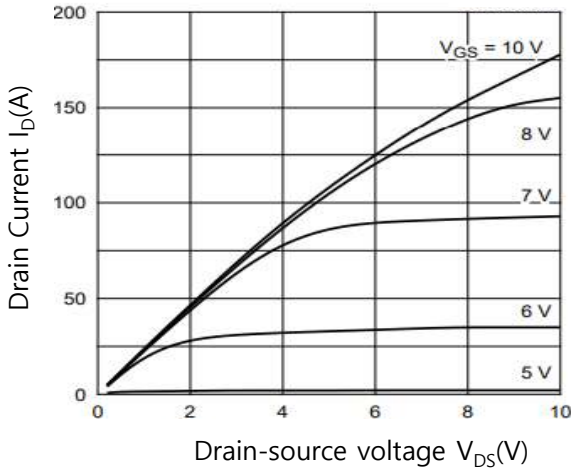
V$_{DS}$ – I$_D$ Characteristics, T$_j$=175℃
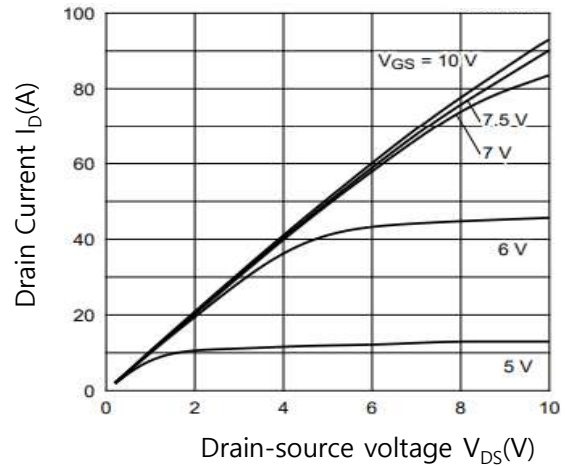
T$_j$ – R$_{DS(on)}$ Characteristics
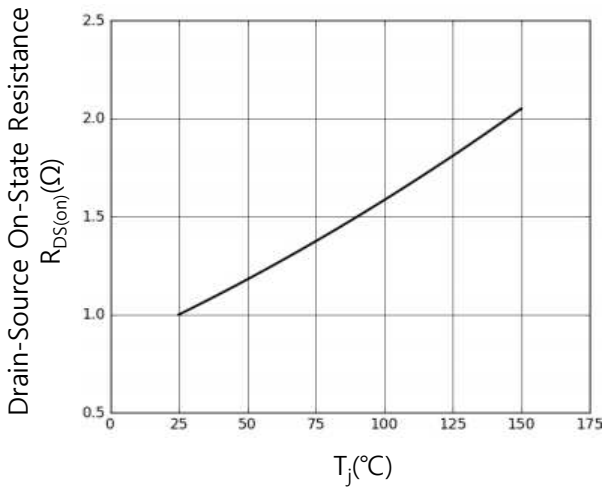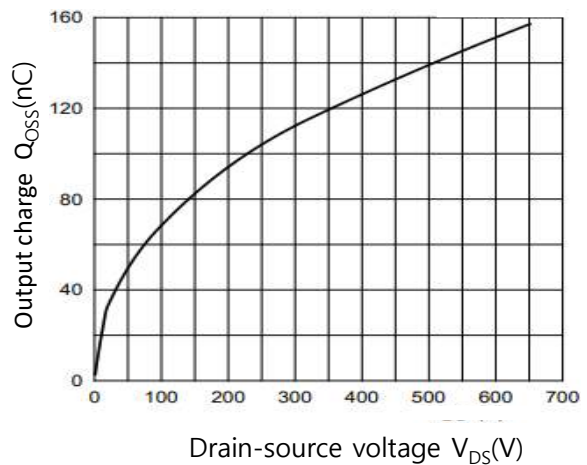

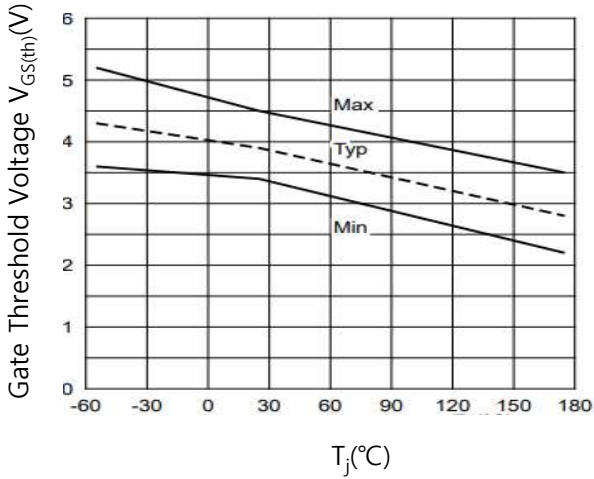### V$_{GS}$ – I$_D$ Characteristics
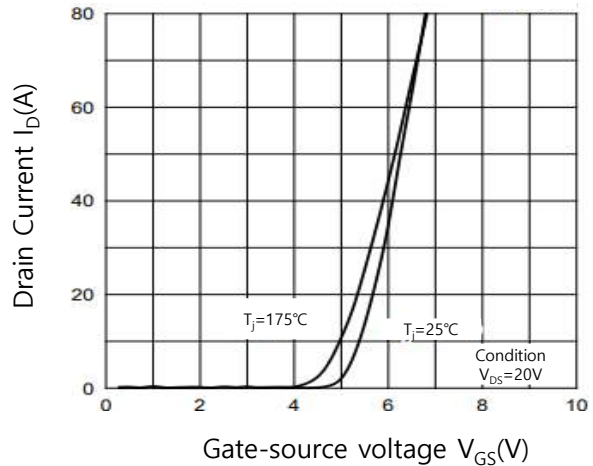
T$_j$ – I$_D$ Characteristics
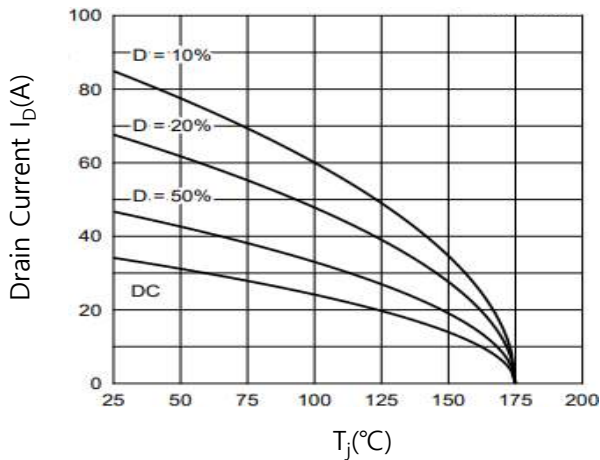
V$_{DS}$ – Q$_{OSS}$ Characteristics

Typical electrical characteristics curves (T$_C$ = 25℃)
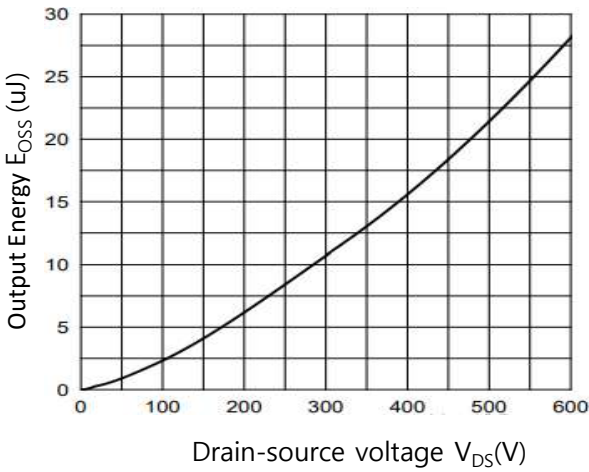
T$_j$ – V$_{GS(th)}$ Characteristics

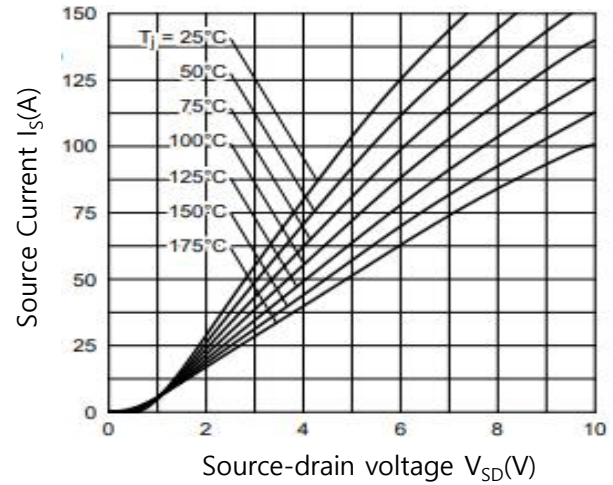### V$_{DS}$ – C Characteristics
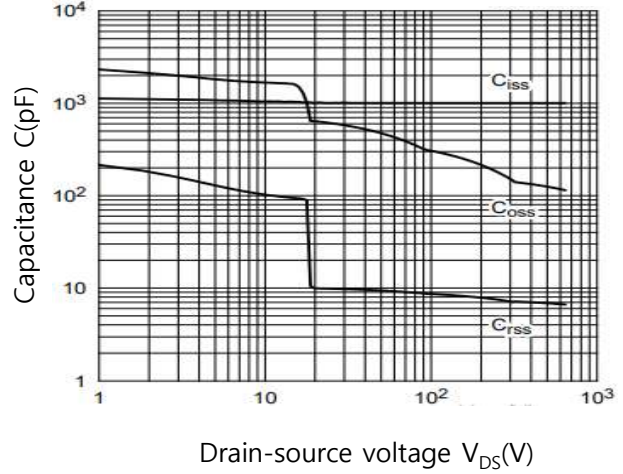
V$_{DS}$ – E$_{OSS}$ Characteristics

V$_{SD}$ – I$_S$ Characteristics

Safe operating area T$_C$=25°C
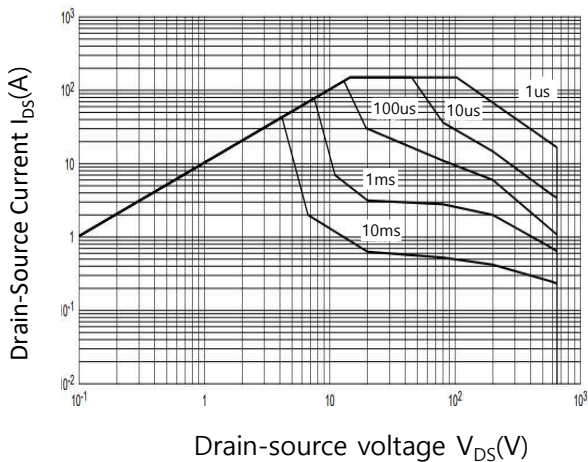
Package dimensions (TO-247)
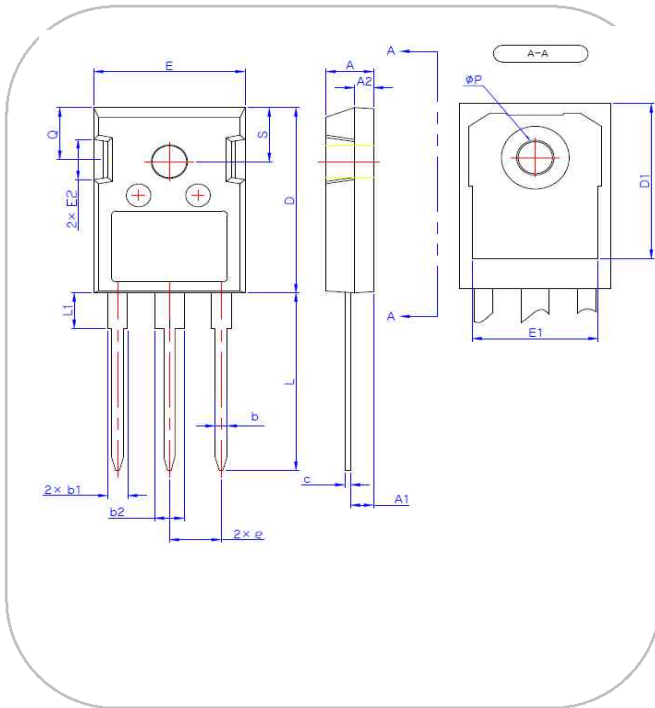
Symbol	Min	Nom	Max
A	4.80	5.00	5.20
A1	2.29	2.36	2.54
A2	1.90	2.00	2.10
b	1.10	1.20	1.30
b1	1.91	2.11	2.20
b2	2.92	3.10	3.20
c	0.50	0.60	0.70
D	20.80	21.07	21.34
D1	17.43	17.63	17.83
E	15.75	15.94	16.13
E1	13.06	13.26	13.46
E2	4.32	4.58	4.83
e	5.45 BSC		
L	19.85	20.00	20.25
L1	-	-	4.49
ΦP	3.55	3.60	3.65
Q	5.59	5.89	6.19
S	6.15 BSC		

Marking information

① EYEQ Lab logo
② Lot number
③ Device code
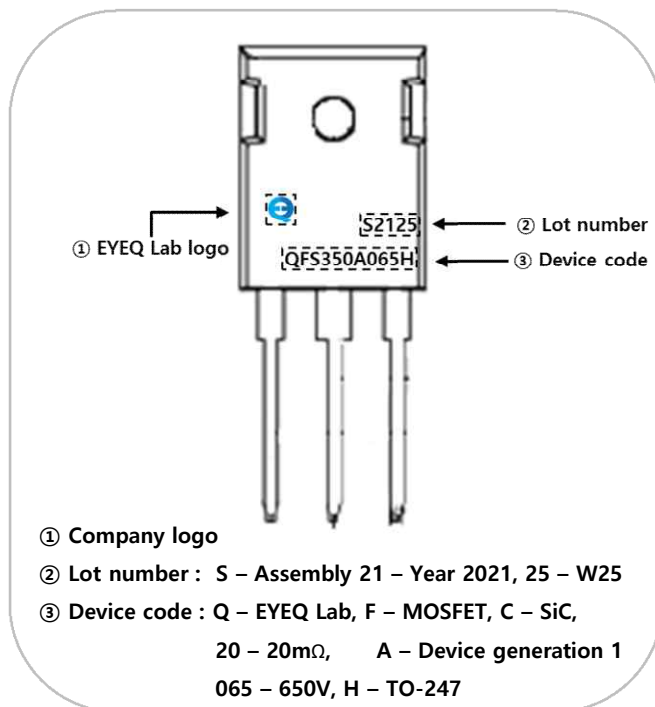
① Company logo

② Lot number : S – Assembly 21 – Year 2021, 25 – W25

③ Device code : Q – EYEQ Lab, F – MOSFET, C – SiC,

20 – 20mΩ,   A – Device generation 1

065 – 650V, H – TO-247