


**General description**

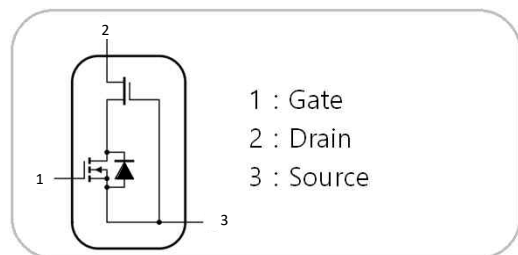
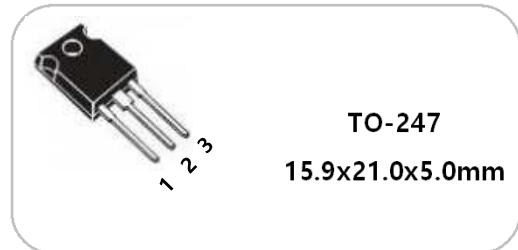
Symbol	Value
$V_{DSS}$ @ $T_C=25^\circ\text{C}$	Min 650V
$V_{TDSS}$ @ $T_C=25^\circ\text{C}$	Min 800V
$I_D$ @ $T_C=25^\circ\text{C}$	46A
$R_{DS(on)}$	Typ 35mΩ
$Q_R$	Typ 150nC
$Q_{G(Total)}$	Typ 25nC


**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


**Package**


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

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	$V_{GS}$	-	$\pm 20$	V
Continuous drain current	$I_D$	$V_{GS}=10\text{V}, T_C=25^\circ\text{C}$	46	A
		$V_{GS}=10\text{V}, T_C=100^\circ\text{C}$	29	A
Pulsed drain current	$I_{D(pulse)}$	Pulse width 10us	230	A
Power dissipation	$P_D$	$T_C=25^\circ\text{C}$	150	W
Operating and storage temperature range	$T_{j}, T_{stg}$	-	-55 to 175	$^\circ\text{C}$




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

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	$I_{DSS}$	$V_{DS}=650V, V_{GS}=0, T_C=25^\circ\text{C}$	-	5	30	$\mu\text{A}$
		$V_{DS}=650V, V_{GS}=0, T_C=175^\circ\text{C}$	-	30	-	$\mu\text{A}$
Gate-source leakage current	$I_{GSS}$	$V_{GS}=20V, V_{DS}=0V$	-	-	400	nA
		$V_{GS}=-20V, V_{DS}=0V$	-	-	400	nA
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=1\text{mA}$	3.4	4	4.6	V
Drain-source on-state resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=30A$	-	35	41	mΩ
Gate resistance	$R_G$	$f=1\text{MHz}$	-	1.9	-	Ω
Input capacitance	$C_{iss}$	$V_{GS}=0V, V_{DS}=400V, f=1\text{MHz}$	-	1500	-	pF
Output capacitance	$C_{oss}$		-	150	-	
Reverse transfer capacitance	$C_{rss}$		-	8	-	
Effective output capacitance, energy related	$C_{o(er)}$	$V_{GS}=0V, V_{DS}=0 \text{ to } 400V$	-	220	-	pF
Gate-source charge	$Q_{GS}$	$V_{DS}=400V, V_{GS}=10V, I_D=32A$	-	10	-	nC
Gate-drain charge	$Q_{GD}$		-	8	-	
Total gate charge	$Q_G$		-	25	-	
Turn on delay time	$t_{d(on)}$	$V_{DS}=400V, V_{GS}=12V, I_D=32A, R_G=30\Omega$	-	60	-	ns
Rise time	$t_r$		-	12	-	
Turn off delay time	$t_{d(off)}$		-	90	-	
Fall time	$t_f$		-	13	-	

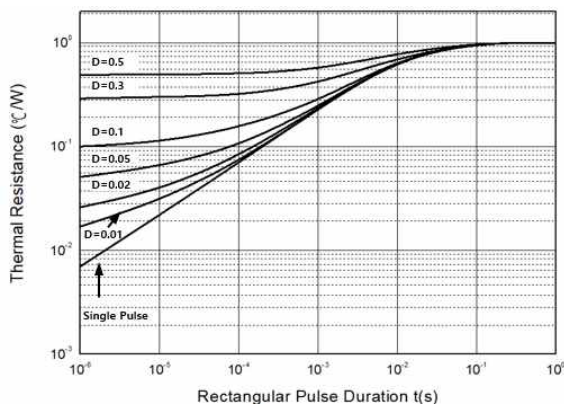
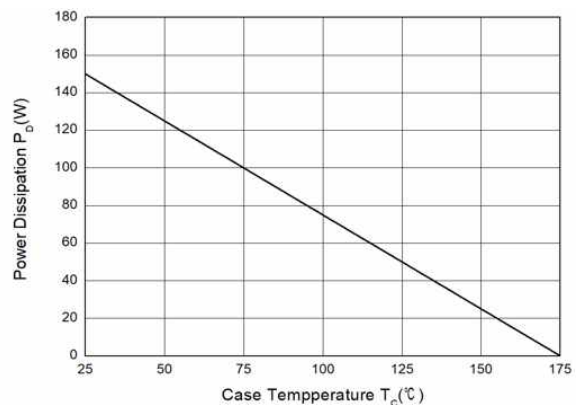



**Body diode(source – drain) electrical characteristics ( $T_C = 25^\circ\text{C}$ )**

Parameter	Symbol	Test condition	Value			Unit
			Min	Typ	Max	
Source-drain voltage	$V_{SD}$	$V_{GS}=0V, I_S=32A$	-	2.0	-	V
Continuous diode Forward current	$I_S$	$V_{GS}=0V, T_C=25^\circ\text{C}$ ,	-	-	47	A
Reverse recovery time	$T_{rr}$	$V_{GS}=0V,$ $I_S=32A, V_{DS}=400V,$ $di/dt=1000A/\mu\text{s}$	-	60	-	ns
Reverse recovery charge	$Q_{rr}$		-	155	-	nC

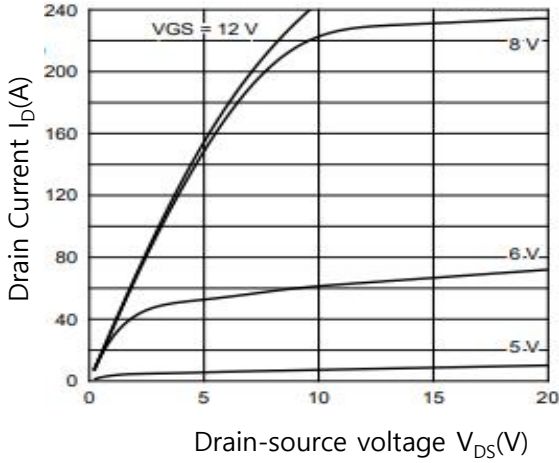

**Thermal characteristics ( $T_C = 25^\circ\text{C}$ )**

Symbol	Parameter	Typ	Max	Unit
$R_{th(j-c)}$	Junction to case	0.9	-	$^\circ\text{C}/\text{W}$

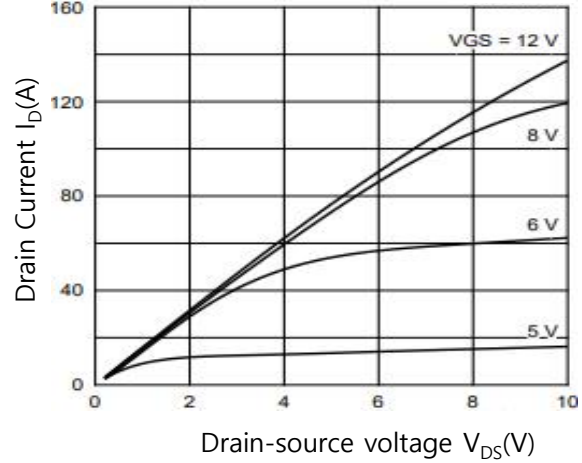
 $t_p - Z_{thjc}$  Characteristics

 $T_C - P_{tot}$  Characteristics


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

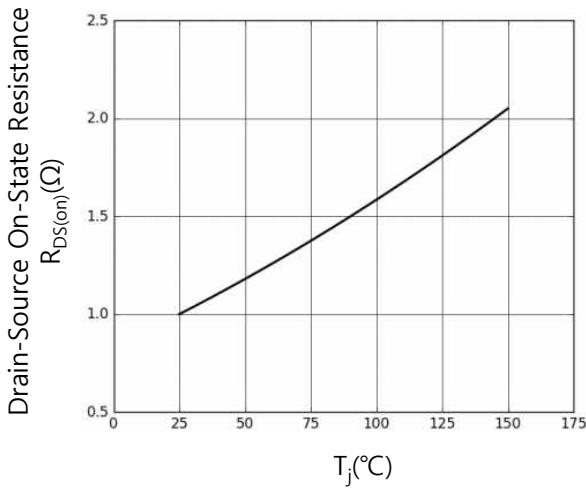
$V_{DS} - I_D$  Characteristics,  $T_j=25^\circ\text{C}$



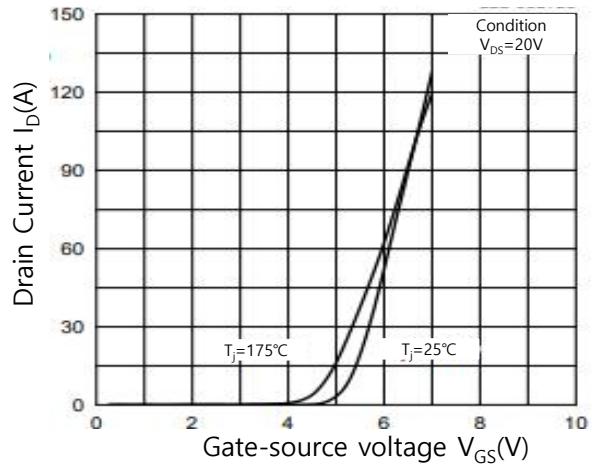
$V_{DS} - I_D$  Characteristics,  $T_j=175^\circ\text{C}$



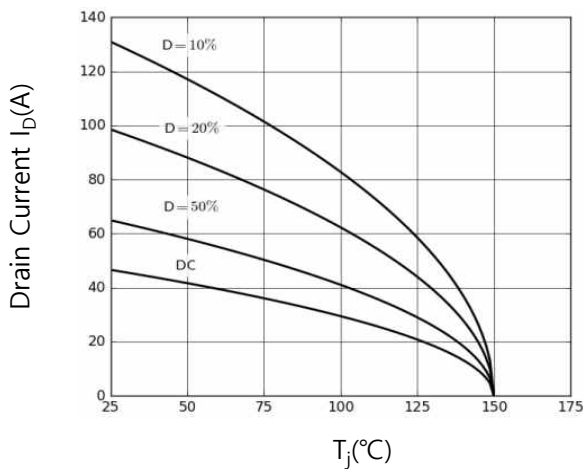
$T_j - R_{DS(on)}$  Characteristics



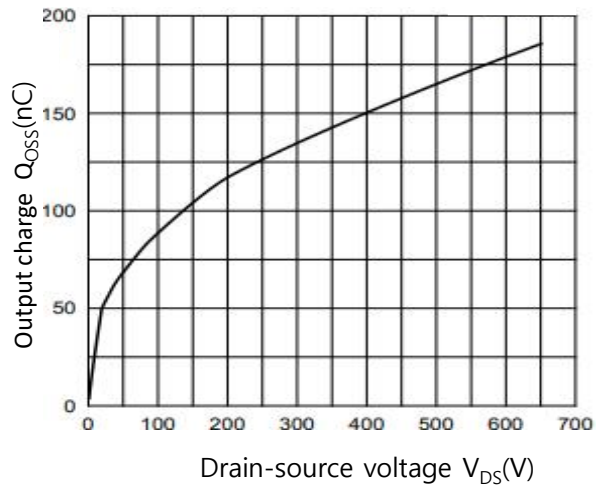
$V_{GS} - I_D$  Characteristics



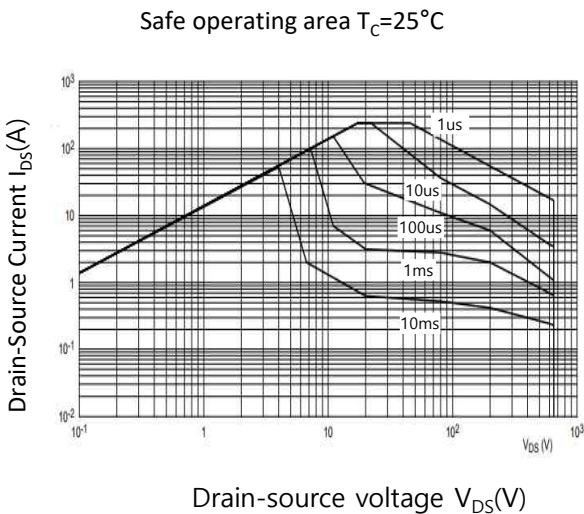
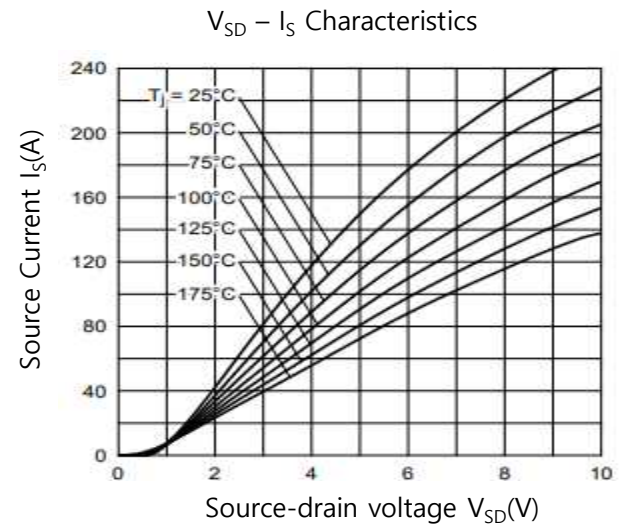
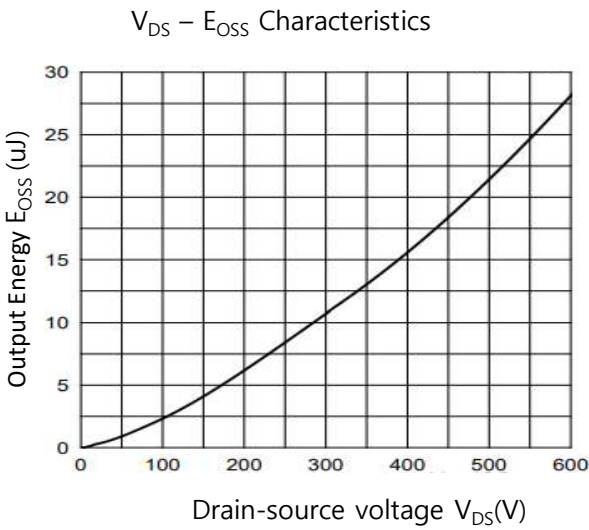
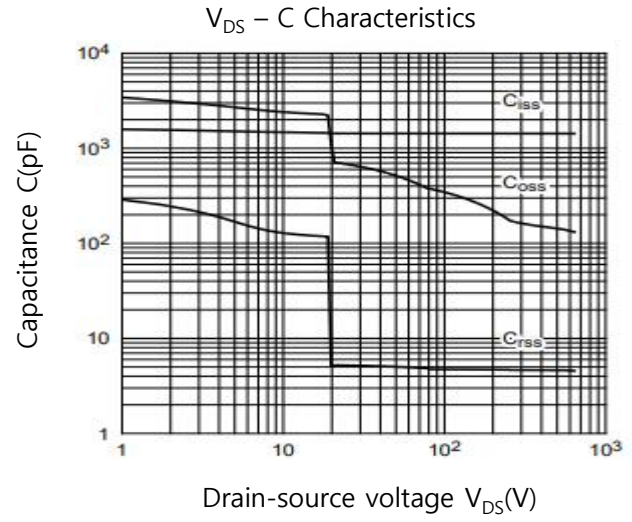
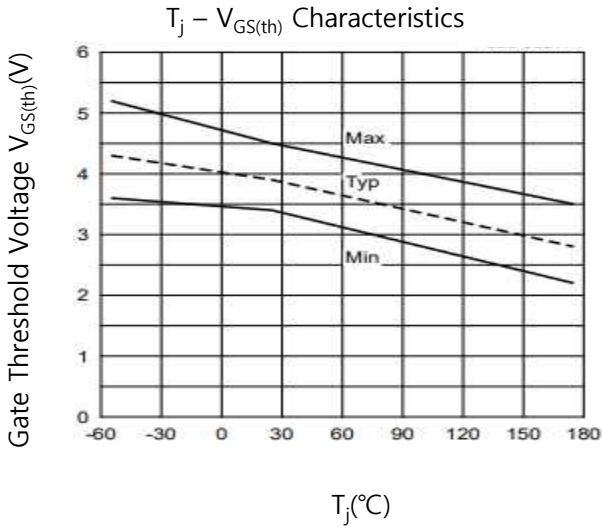
$T_j - I_D$  Characteristics



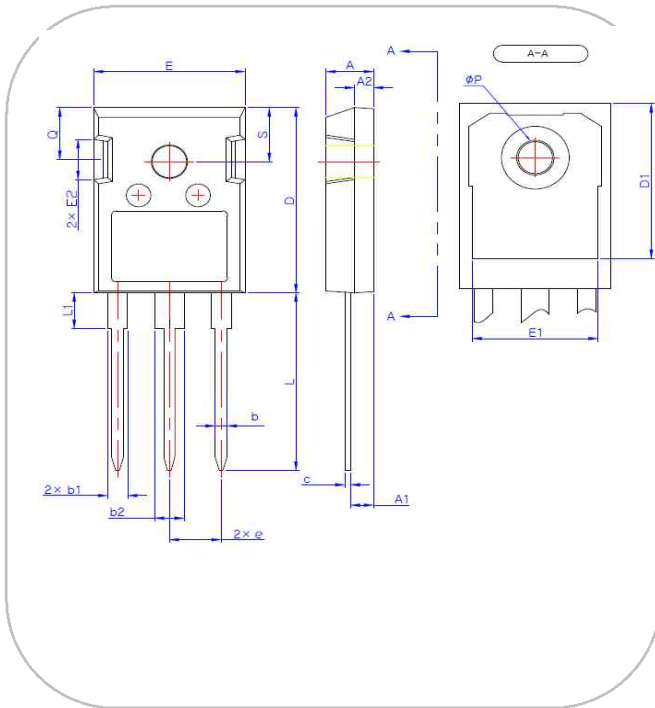
$V_{DS} - Q_{OSS}$  Characteristics



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

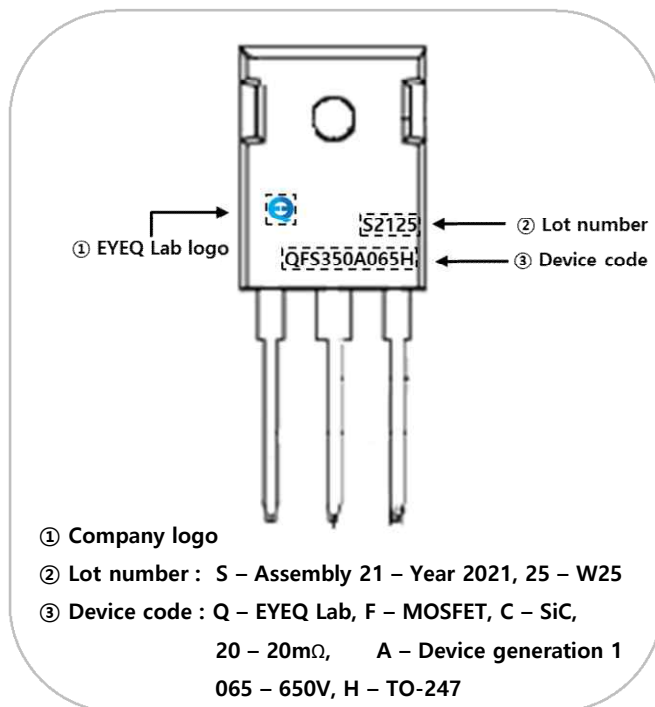


**Package dimensions (TO-247)**



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 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