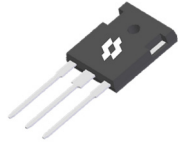


Product Summary

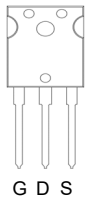
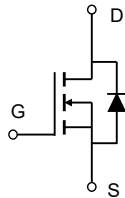
V_{DS}	$R_{DS(ON_MAX)}$	I_{D_MAX}
650 V	36 m Ω @ $V_{GS} = 10V$	79 A

TO247-3L


Top View



Bottom View


PIN Configuration
(Top View)


Schematic Diagram

Features

- Low On-Resistance
- Fast Switching Capability
- 100% ΔV_{DS} & UIS & Rg Tested


Applications

- LED Lighting
- Charger and Adapter
- PC and Telecom Power

Mechanical Data

- Green Molding Compound
- Moisture Sensitivity: Level 3 per J-STD-020
- UL Flammability Classification Rating 94V-0

Ordering Information

Orderable Part Number	Package Type	Device Marking	Form	Quantity (pcs)
SMJ65R036CFYS	TO247-3L	65R036CFS	Tube	30

Maximum Ratings (@ $T_C = 25^\circ\text{C}$, unless otherwise specified.)

Parameter	Symbol	Value	Unit
Drain - Source Voltage	V_{DS}	650	V
Gate - Source Voltage	V_{GS}	± 30	V
Continuous Drain Current ($V_{GS} = 10V$) ⁽¹⁾	I_D	$T_C = 25^\circ\text{C}$ 79	A
		$T_C = 100^\circ\text{C}$ 50	A
Pulsed Drain Current ⁽²⁾	I_{DM}	236	A
Single Pulse Avalanche Energy ⁽³⁾	E_{AS}	1200	mJ
Single Pulse Avalanche Current ($L = 10.0\text{mH}$)	I_{AS}	3.5	A
Power Dissipation	P_D	$T_C = 25^\circ\text{C}$ 521	W
		$T_C = 100^\circ\text{C}$ 208.3	W
MOSFET dv/dt Ruggedness, $V_{DS}=0\dots 400V$	dv/dt	50	V/ns
Reverse Diodes dv/dt, $V_{DS}=0\dots 400V$, $I_{SD} \leq I_D$	dv/dt	50	V/ns
Junction & Storage Temperature Range	T_J, T_{STG}	-55 ~ +150	$^\circ\text{C}$

Thermal Characteristics

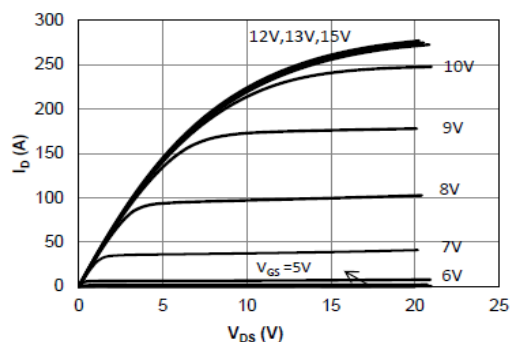
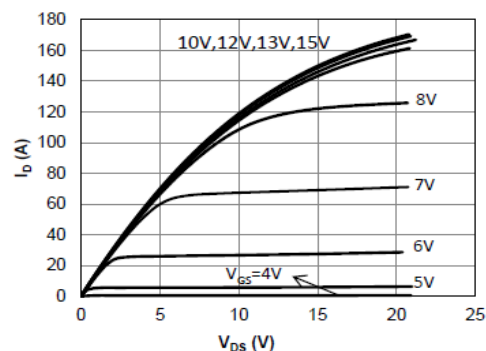
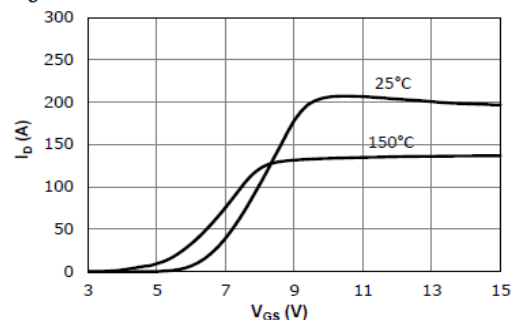
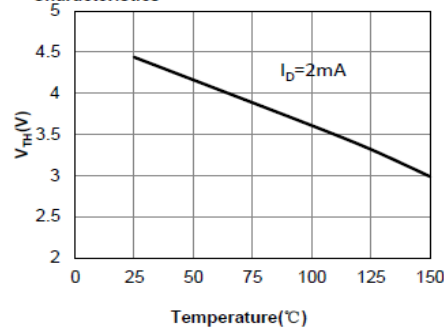
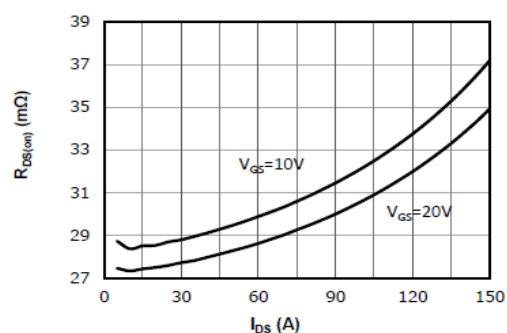
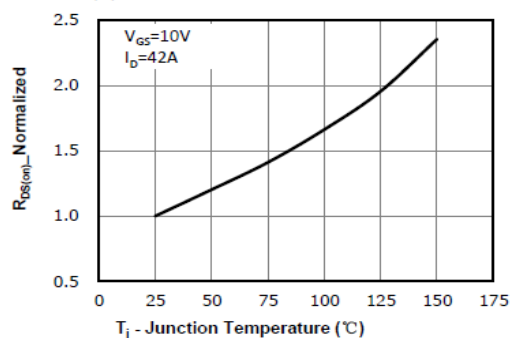
Parameter	Symbol	Typ.	Max.	Unit
Thermal Resistance, Junction-to-Ambient ⁽⁴⁾	$R_{\theta JA}$	38	47	$^\circ\text{C/W}$
Thermal Resistance, Junction-to-Case ⁽⁵⁾	$R_{\theta JC}$	0.17	0.24	$^\circ\text{C/W}$

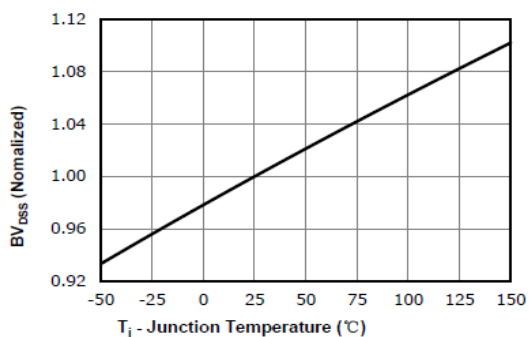
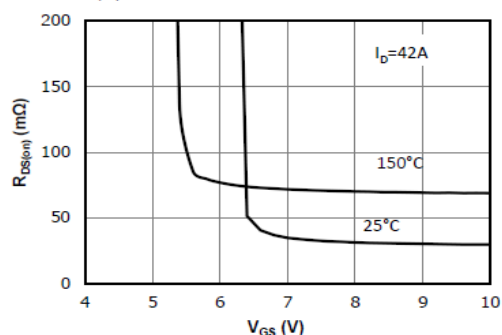
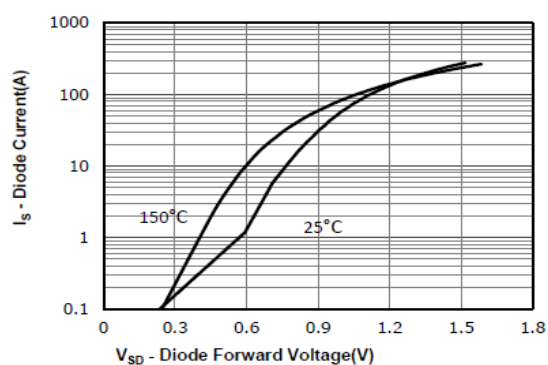
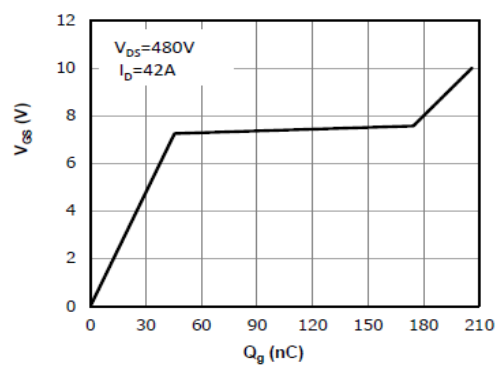
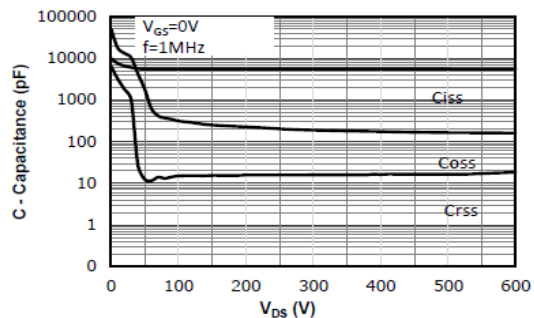
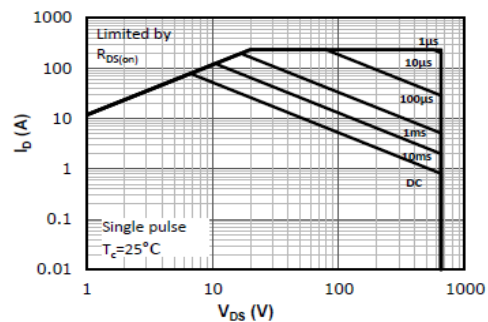
Electrical Characteristics (@ $T_J = 25^\circ\text{C}$, unless otherwise specified.)

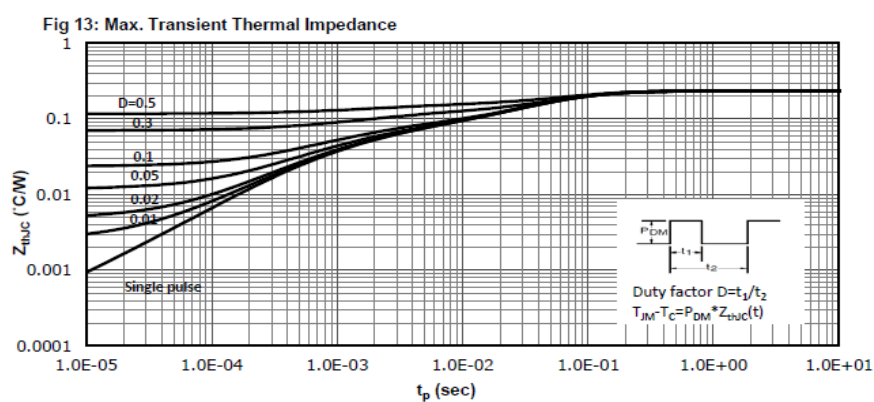
Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Off Characteristics ⁽⁶⁾						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D = 250μA	650	-	-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 650V, V _{GS} = 0V	-	-	5.0	μA
		T _J = 125°C	-	1500	-	μA
Gate-Source Leakage Current	I _{GSS}	V _{GS} = ±30V, V _{DS} = 0V	-	-	±100	nA
On Characteristics ⁽⁶⁾						
Gate Threshold Voltage	V _{GS(th)}	V _{GS} = V _{DS} , I _D = 250μA	3.2	3.9	4.6	V
Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} = 10V, I _D = 10A	-	30	36	mΩ
Diodes Forward Voltage	V _{SD}	I _S = 10A, V _{GS} = 0V	-	0.90	1.1	V
Dynamic Characteristics ⁽⁷⁾						
Input Capacitance	C _{iss}	V _{DS} = 100V, V _{GS} = 0V, f = 1MHz	-	5550	-	pF
Output Capacitance	C _{oss}		-	310	-	pF
Reverse Transfer Capacitance	C _{rss}		-	15.0	-	pF
Gate Resistance	R _g	V _{GS} = 0V, V _{DS} = 0V, f = 1MHz	-	1.0	-	Ω
Switching Characteristics ⁽⁷⁾						
Turn-On DelayTime	t _{d(on)}	V _{GS} = 10V, V _{DS} = 400V I _D = 17A, R _{GEN} = 27Ω	-	165	-	ns
Rise Time	t _r		-	115	-	ns
Turn-Off DelayTime	t _{d(off)}		-	620	-	ns
Fall Time	t _f		-	130	-	ns
Gate Charge Characteristics ⁽⁷⁾						
Total Gate Charge (V _{GS} = 10V)	Q _g	V _{DS} = 480V, I _D = 10A V _{GS} = 10V	-	207	-	nC
Total Gate Charge (V _{GS} = 8.0V)	Q _g		-	180	-	nC
Gate-Source Charge	Q _{gs}		-	45.0	-	nC
Gate-Drain Charge	Q _{gd}		-	130	-	nC
Gate Plateau Voltage	V _{plateau}		-	7.0	-	V
Drain-Source Diode Characteristics ⁽⁷⁾						
Body Diode Reverse Recovery Time	t _{rr}	I _F = 17A, dI/dt = 100A/μs, T _J = 25°C	-	183	-	ns
Body Diode Reverse Recovery Charge	Q _{rr}		-	1.21	-	μC
Diode Forward Current	I _S	T _C = 25°C	-	-	79	A

Notes:

1. This current is chip limited, which is calculated based on R_{thjc} .
2. This current is calculated on single pulse with 10 μs Pulse & Duty Cycle = 1%.
3. Defined by design, not subject to production test, E_{AS} condition: $T_J = 25^\circ\text{C}$, $V_{DD} = 400V$, $V_{GS} = 10V$, $L = 50mH$.
4. Device mounted on FR-4 substrate PC board with 2oz copper in 1inch square cooling area.
5. Thermal resistance from junction to the exposed pad.
6. Short duration pulse test used to minimize self-heating effect.
7. Defined by design, not subject to production.
8. $C_{O(er)}$ is a fixed capacitance that gives the same stored energy as C_{OSS} while V_{DS} is rising from 0 to 480V.
9. $C_{O(tr)}$ is a fixed capacitance that gives the same charging time as C_{OSS} while V_{DS} is rising from 0 to 480V.

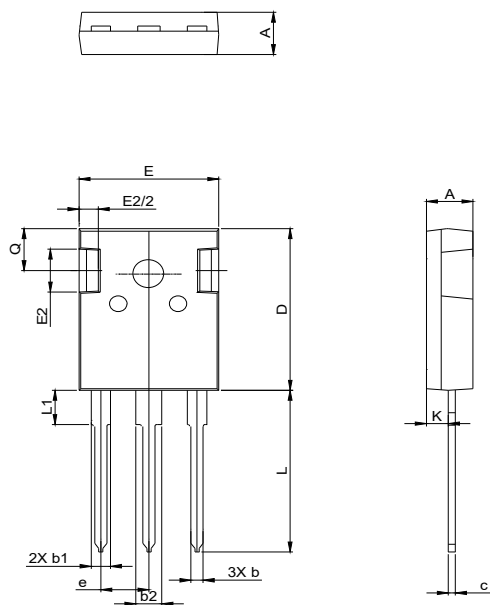
Typical Electrical and Thermal Characteristics
Fig 1: Output Characteristics ($T_J=25^\circ\text{C}$)

Fig 2: Output Characteristics ($T_J=150^\circ\text{C}$)

Fig 3: Transfer Characteristics

Fig 4: V_{TH} vs. T_J Temperature Characteristics

Fig 5: $R_{DS(on)}$ vs. I_{DS} Characteristics ($T_J=25^\circ\text{C}$)

Fig 6: $R_{DS(on)}$ vs. Temperature


Typical Electrical and Thermal Characteristics
Fig 7: BV_{DSS} vs. Temperature

Fig 8: $R_{DS(on)}$ vs. Gate Voltage

Fig 9: Body-diode Forward Characteristics

Fig 10: Gate Charge Characteristics

Fig 11: Capacitance Characteristics

Fig 12: Safe Operating Area


Typical Electrical and Thermal Characteristics


TO247L Package Outline

Package Outline



DIM.	MILLIMETER		
	MIN.	NOM.	MAX.
A	4.80	5.00	5.20
b	1.00	1.20	1.40
b1	1.80	2.00	2.20
b2	2.80	3.00	3.20
c	0.50	0.60	0.70
D	20.80	21.00	21.20
E	15.50	15.80	16.10
E2	4.50	5.00	5.50
L	19.70	20.00	20.30
L1	4.00	4.20	4.40
K	2.30	2.40	2.50
e	5.44 BSC		