

Descriptions

This is N-Ch SiC Power MOSFET in a TOLL Plastic Package.

Features

- VDS=650V
- ID=30A (Tc=25°C)
- RDS=60mΩ (VGS=18V,TJ=25°C)
- Low On-Resistance with High Blocking Voltage
- High Speed Switching with Low Capacitance
- Avalanche Ruggedness
- Halogen Free, Rohs Compliant

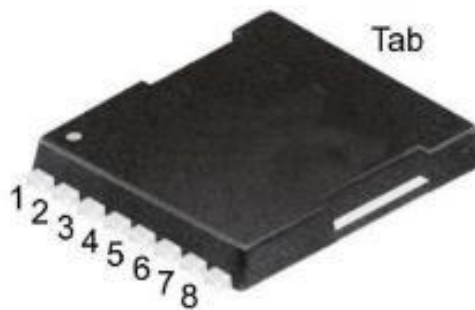
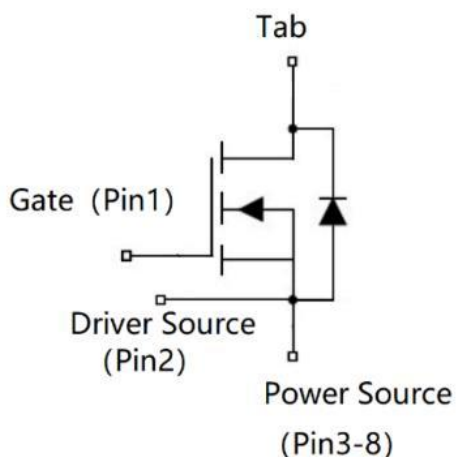
Applications

- Switch Mode Power Supplies (SMPS)
- Pulsed Power applications
- Motor Drivers & Battery Chargers
- High Voltage DC/DC Converter

Benefits

- High Switching Frequency Operation
- High System Efficiency
- Increased Power Density
- Reduction of Heat Sink Requirements

Schematic & PIN Configuration



Maximum Rated Valued of MOSFET

Drain-source voltage	V_{DSS}		650	V
Recommend Gate-Source Voltage	V_{GSop}		-10/25	V
Gate-Source Voltage	V_{GSmax}		-5/20	V
Continuous drain current	I_D	$T_C=100^{\circ}C, V_{GS}=20V$	22	A
		$T_C=25^{\circ}C, V_{GS}=20V$	30	
Pulsed drain current	I_{DM}	t_{Pulse} limited by T_{Jmax}	65	A
Maximum power dissipation	P_{tot}	$T_C=25^{\circ}C, T_J=175^{\circ}C$	176	W
Operating Junction Temperature	T_J		-55~175	$^{\circ}C$
Storage Temperature	T_{stg}		-55~175	$^{\circ}C$

Thermal Characteristic

Thermal resistance, junction-to-case	$R_{\theta JC}$		0.85	$^{\circ}C/W$
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Electrical Characteristics of MOSFET

Drain-Source breakdown voltage	$V_{(BR)DS}$	$I_D=100\mu A, V_{GS}=0V$	$T_J=25^\circ C$	650	-	-	V
Gate threshold voltage	$V_{GS(th)}$	$I_D=5mA, V_{DS}=V_{GS}$	$T_J=25^\circ C$	2.0	2.4	4.0	V
Zero gate voltage drain current	I_{DSS}	$V_{DS}=650V, V_{GS}=0V$	$T_J=25^\circ C$	-	1	100	μA
Gate-Source leakage current	I_{GSS}	$V_{DS}=0V, V_{GS}=20V$	$T_J=25^\circ C$	-	-	200	nA
Drain-Source On-State resistance	$R_{DS(ON)}$	$V_{GS}=20V, I_D=20A$	$T_J=25^\circ C$	-	60	85	m Ω
			$T_J=150^\circ C$	-	94	-	m Ω
Transconductance	G_{fs}	$V_{DS}=20V, I_D=20A$	$T_J=25^\circ C$	-	4.7	-	S
Internal gate resistor	R_{Gint}	$f=1MHz, V_{AC}=25mV$	$T_J=25^\circ C$	-	2.0	-	Ω
Input capacitance	C_{iss}	$f=1MHz, V_{DS}=400V, V_{AC}=25mV, V_{GS}=0V$	$T_J=25^\circ C$	-	1700	-	pF
Output capacitance	C_{oss}			-	190	-	pF
Reverse transfer capacitance	C_{rss}			-	55	-	pF
Gate to source charge	Q_{GS}	$V_{DS}=400V, I_{DS}=10A, V_{GS}=-5V/18V$	$T_J=25^\circ C$	-	18	-	nC
Gate to drain charge	Q_{GD}			-	19	-	nC
Total gate charge	Q_G			-	65	-	nC
Turn-on delay time	$t_{d on}$	$V_{DS}=400V, I_{DS}=10A, R_{G-ext}=5\Omega, V_{GS}=-5V/18V,$	$T_J=25^\circ C$	-	15	-	ns
Rise time	t_r		$T_J=25^\circ C$	-	46	-	ns
Turn-off delay time	$t_{d off}$		$T_J=25^\circ C$	-	14	-	ns
Fall time	t_f		$T_J=25^\circ C$	-	9	-	ns
Turn-on energy loss per pulse	E_{on}		$T_J=150^\circ C$	-	145	-	μJ
Turn-off energy loss per pulse	E_{off}		$T_J=150^\circ C$	-	35	-	μJ

Characteristics of Body Diode

Forward voltage	V_{SD}	$I_{SD}=6.6A, V_{GS}=-5V$	$T_J=25^\circ C$	-	3.5	-	V
Continuous diode forward current	I_S	$V_{GS}=0V$	$T_J=25^\circ C$	-	20	-	A
Peak reverse recovery current	I_{RM}	$V_{DS}=400V, I_{SD}=20A, V_{GS}=-5V, -di/dt=1200A/\mu s$	$T_J=150^\circ C$	-	13	-	A
Reverse recovery time	t_{rr}		$T_J=150^\circ C$	-	36	-	ns
Recovery charge	Q_{rr}		$T_J=150^\circ C$	-	195	-	nC

Typical Characteristics

Fig.1 Typical Forward Output Characteristics at $T_J=25^\circ\text{C}$

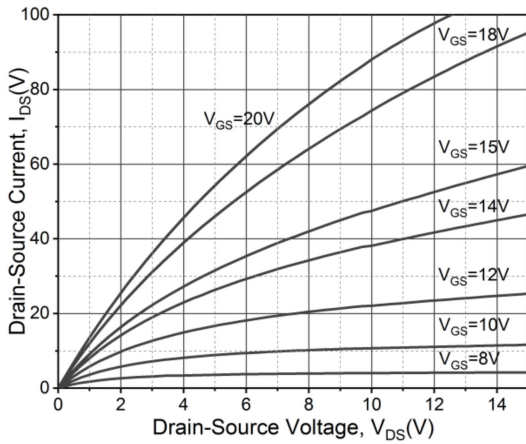


Fig.2 Typical Forward Output Characteristics at $T_J=150^\circ\text{C}$

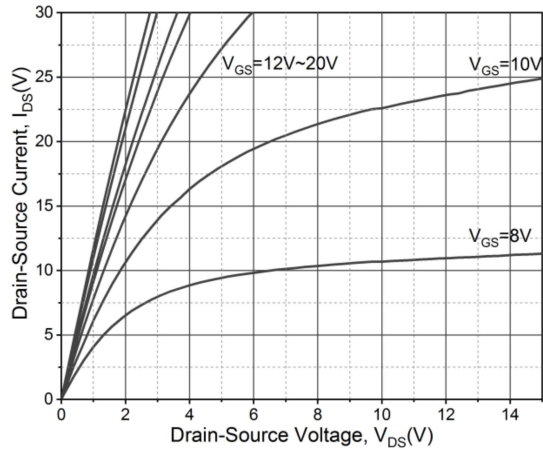


Fig.3 On-Resistance For Various Gate Voltage

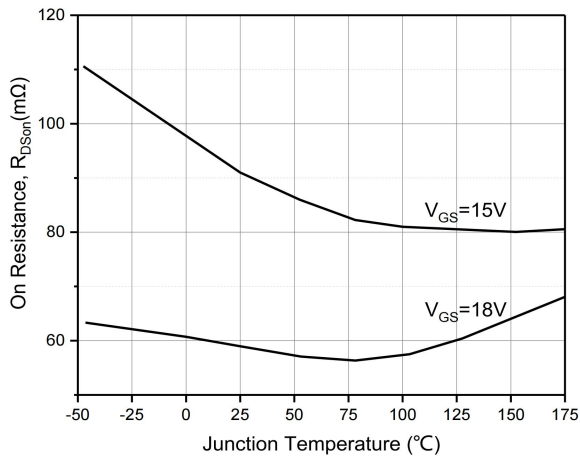


Fig.4 Threshold Voltage vs. Temperature

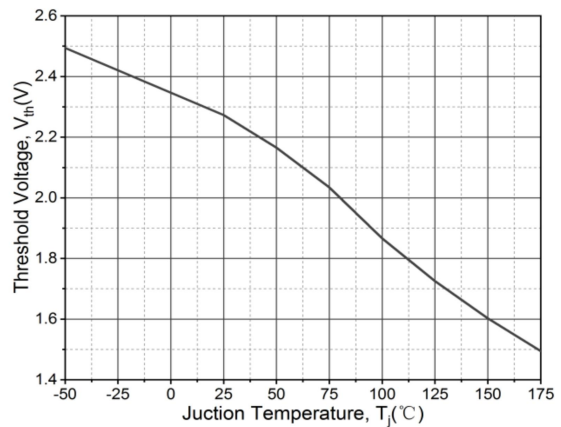


Fig.5 Body Diode Characteristics at $T_J=25^\circ\text{C}$

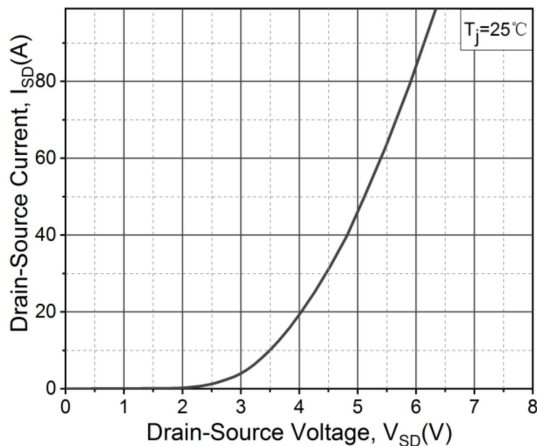
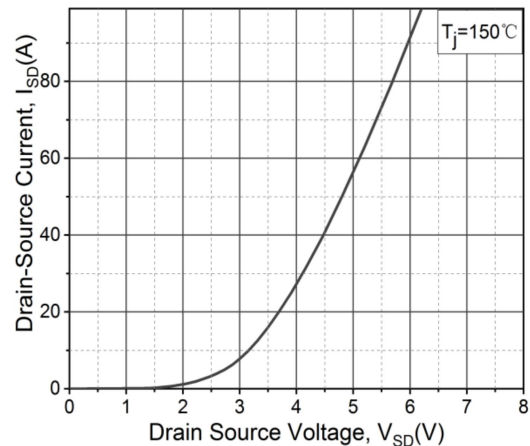


Fig.6 Body Diode Characteristics at $T_J=150^\circ\text{C}$



Typical Characteristics

Fig.7 Transfer Characteristic for Various Junction Temperatures

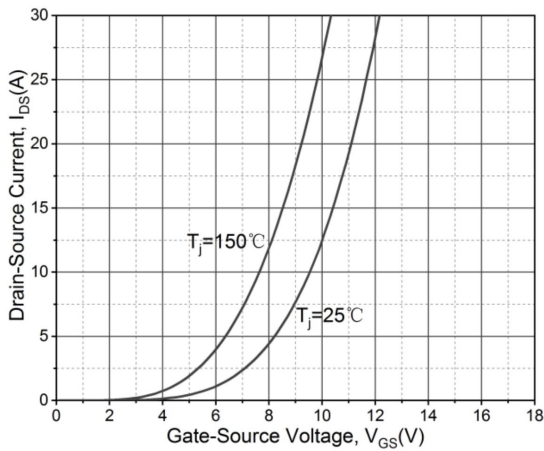


Fig.9 Gate Charge Characteristics

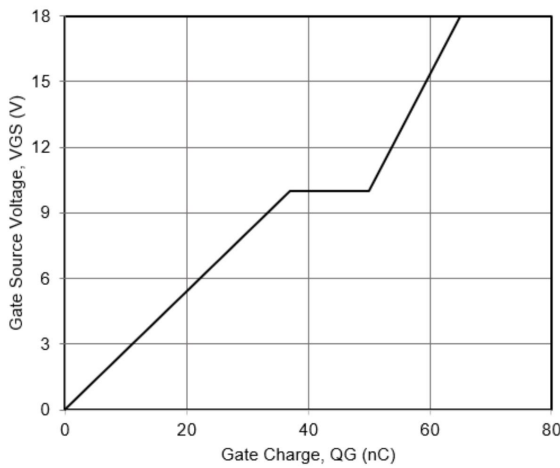


Fig.11 Transient Thermal Impedance (Junction – Case)

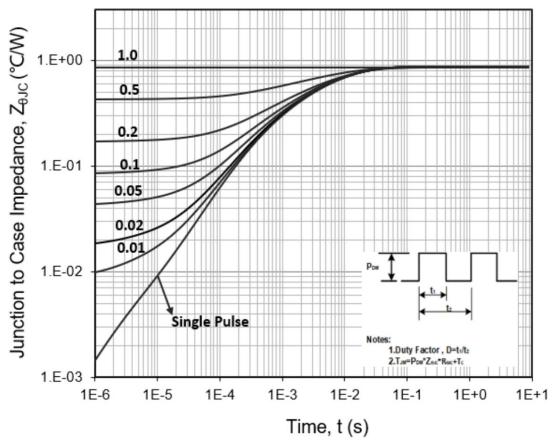


Fig.8 Maximum Power Dissipation Derating vs. Case Temperature

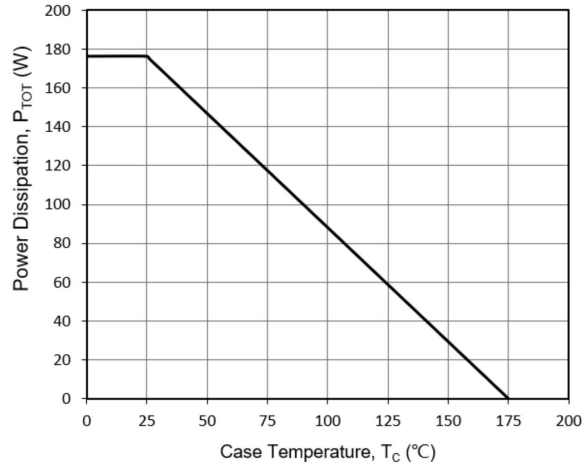


Fig.10 Capacitance vs. Drain-Source Voltage (0 - 650V)

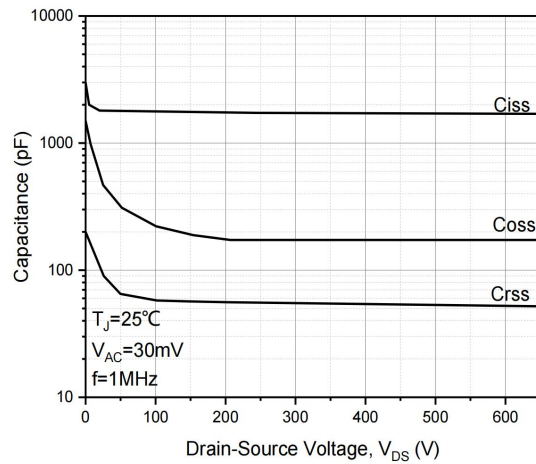
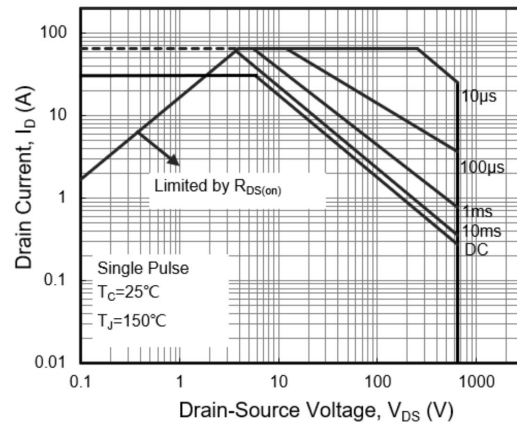


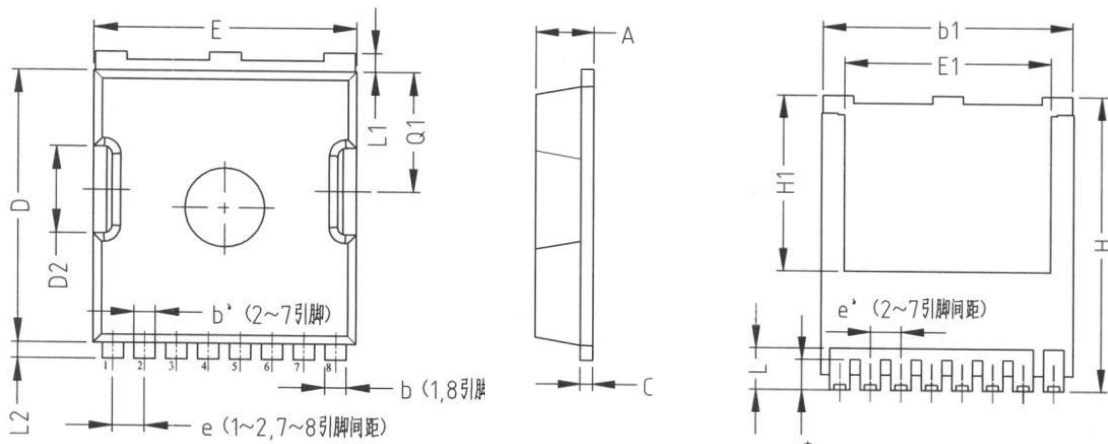
Fig.12 Safe Operating Area



Ordering Information

Part	Package	Marking	Packing method
CTCM060LL65T2C	TOLL	60LL65T2C	Tape and Reel

Package Information



COMMON DIMENSIONS

SYMBOL	MM		
	MIN	NOM	MAX
A	2.15	2.30	2.45
b	0.70	0.75	0.85
b'	0.65	0.70	0.80
b1	9.65	9.80	9.95
C	0.45	0.50	0.60
D	10.18	10.38	10.58
D2	3.15	3.30	3.45
E	9.70	9.90	10.10
E1	7.95	8.10	8.25
e	BSC 1.225		
e'	BSC 1.20		
Q1	4.40	4.55	4.70
H	11.48	11.68	11.88
H1	6.80	6.95	7.10
L	1.60	1.80	2.00
L1	0.50	0.70	0.90
L2	0.48	0.60	0.72
L4	1.00	1.15	1.30