

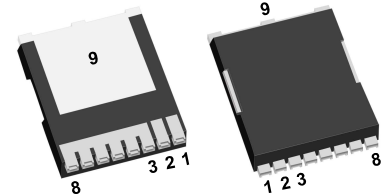
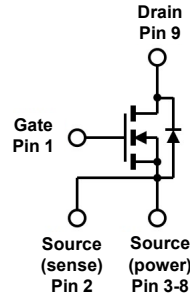
ICE55M75T Silicon Carbide Power MOSFET

Features

- 750V 55mohm SiC MOSFET
- High blocking voltage with low on-resistance
- High-speed switching with low capacitances
- Fast Reverse Recovery
- Industrial Grade SiC MOSFET Qualified by Jedec
- Optimized design for high performance power systems



Product Summary			
I_D	$T_A=25^{\circ}\text{C}$	37A	Max.
$V_{(BR)DSS}$	$T_C=25^{\circ}\text{C}$	750V	Min.
$r_{DS(on)}$	$V_{GS}=18\text{V}$	55m Ω	Typ.
Q_g	$V_{DS}=500\text{V}$	31nC	Typ.



TOLL

1=Gate, 2=Source(sense)
3-8 =Source (power), 9=Drain

Maximum ratings^a at $T_j=25^{\circ}\text{C}$, unless otherwise specified

Parameter	Symbol	Conditions	Value	Unit
Continuous drain current	I_D	$T_c=25^{\circ}\text{C}$ $T_c=100^{\circ}\text{C}$	37 26	A
Pulsed drain current	$I_{D, \text{pulse}}$	$T_c=25^{\circ}\text{C}$	122	A
Maximum gate source voltage	$V_{GS(max)}$		-10/+22	V
Operational gate source voltage	$V_{GS \text{ op}}$		-5/+18	V
Power dissipation	P_{tot}	$T_c=25^{\circ}\text{C}$	125	W
		$T_c=100^{\circ}\text{C}$	62	
Storage temperature	T_{stg}		-55 to +175	$^{\circ}\text{C}$
Operating temperature	T_j			

^a limited by T_{jmax}

Parameter	Symbol	Conditions	Values			Unit
			Min	Typ	Max	

Thermal characteristics

Thermal resistance, junction-case	R_{thJC}		-	-	1.2	°C/W
Soldering temperature, wave soldering only allowed at leads	T_{solder}	1.6mm (0.063in.) from case for 10 s	-	-	260	°C

Electrical characteristics^a, at $T_j=25^{\circ}\text{C}$, unless otherwise specified

Static characteristics

Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS}=0V$	750	-	-	V
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$, $I_D=5mA$, $T_j=25^{\circ}\text{C}$	2	2.96	4	
		$V_{DS}=V_{GS}$, $I_D=5mA$, $T_j=175^{\circ}\text{C}$	-	2.15	-	
Zero gate voltage drain current	I_{DSS}	$V_{DS}=750V$, $V_{GS}=0V$, $T_j=25^{\circ}\text{C}$	-	0.1	50	μA
		$V_{DS}=750V$, $V_{GS}=0V$, $T_j=175^{\circ}\text{C}$	-	1	-	
Gate source leakage current	I_{GSS}	$V_{GS}=-10/+22V$, $V_{DS}=0V$	-	-	± 100	nA
Drain-source on-state resistance	$R_{DS(on)}$	$V_{GS}=18V$, $I_D=20A$, $T_j=25^{\circ}\text{C}$	-	55	71	m Ω
		$V_{GS}=18V$, $I_D=20A$, $T_j=175^{\circ}\text{C}$	-	70	-	
Gate resistance	R_G	$f=1\text{ MHz}$, $V_{AC}=30mV$	-	4.3	-	Ω

Dynamic characteristics

Input capacitance	C_{iss}	$V_{DS}=500V$, $V_{GS}=0V$, $f=100\text{ kHz}$, $V_{AC}=30mV$	-	995	-	pF
Output capacitance	C_{oss}		-	70	-	
Reverse transfer capacitance	C_{rss}		-	4	-	
C_{oss} stored energy	E_{oss}		-	11	-	μJ
Forward transconductance	g_{FS}	$V_{DS}=20V$, $I_D=20A$	-	20	-	S

Parameter	Symbol	Conditions	Values			Unit
			Min	Typ	Max	

Gate Charge Characteristics

Gate to source charge	Q_{gs}	$V_{DS}=500V, I_D=20A,$ $V_{GS}=-5 \text{ to } +18V$	-	14	-	nC
Gate to drain charge	Q_{gd}		-	3	-	
Gate charge total	Q_g		-	31	-	

Reverse Diode

Continuous forward current	I_S	$V_{GS}=-5V$	-	-	37	A
Diode forward voltage	V_{SD}	$V_{GS}=-5V, I_{SD}=10A, T_j=25^\circ C$	-	3.8	-	V
		$V_{GS}=-5V, I_{SD}=10A,$ $T_j=175^\circ C$	-	3.4	-	

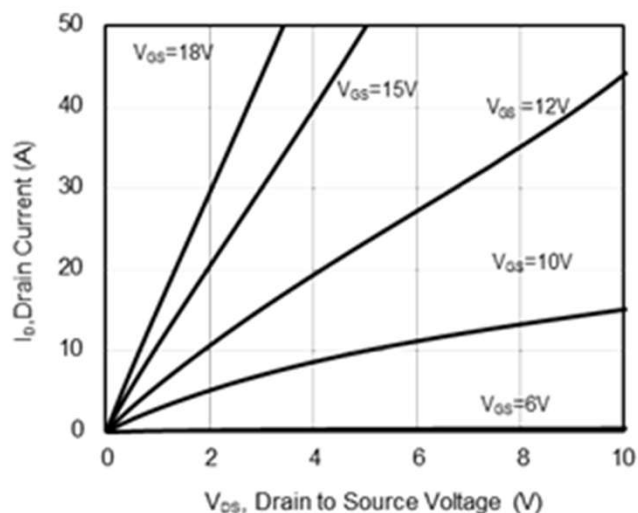


Fig 1. Output Characteristics, $T_j = -55^\circ\text{C}$

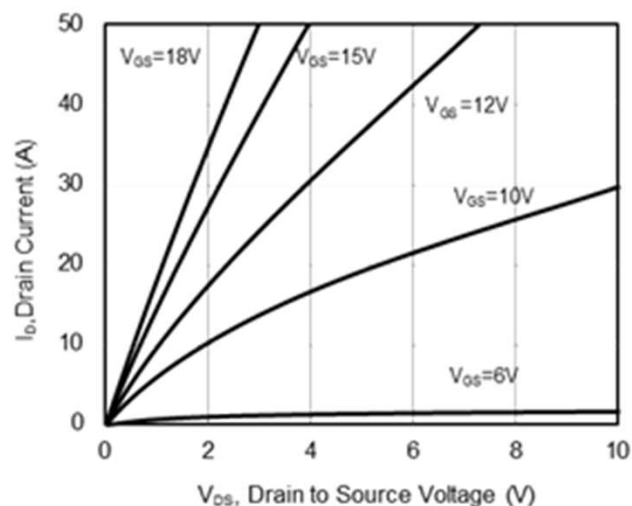


Fig 2. Output Characteristics, $T_j = 25^\circ\text{C}$

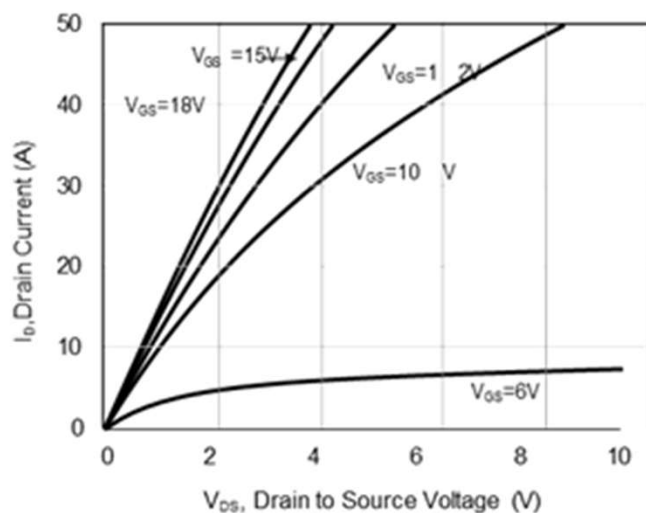


Fig 3. Output Characteristics, $T_j = 175^\circ\text{C}$

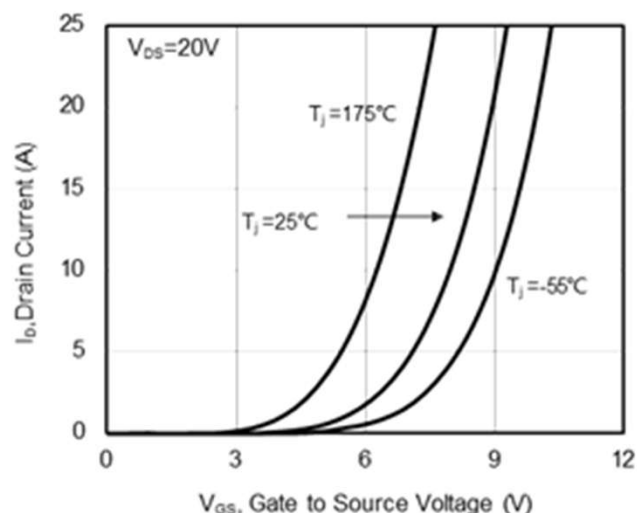


Fig 4. Transfer Characteristics

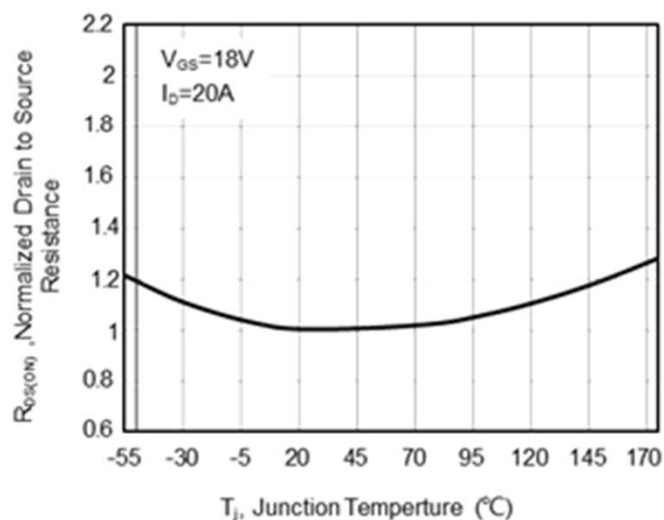


Fig 5. On-Resistance Variation with Temperature

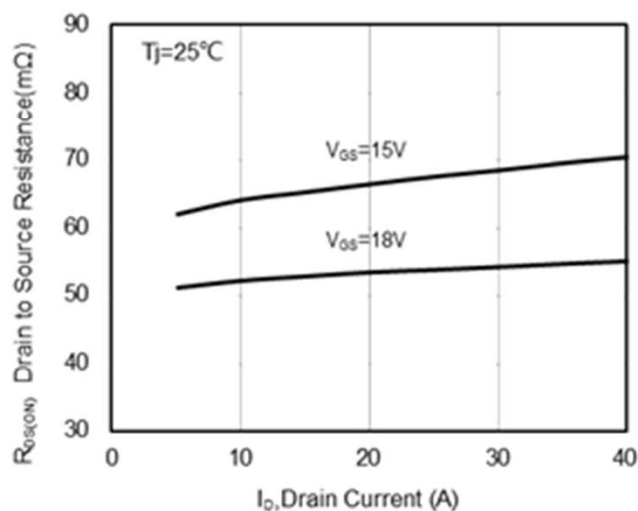


Fig 6. On-Resistance vs Drain Current

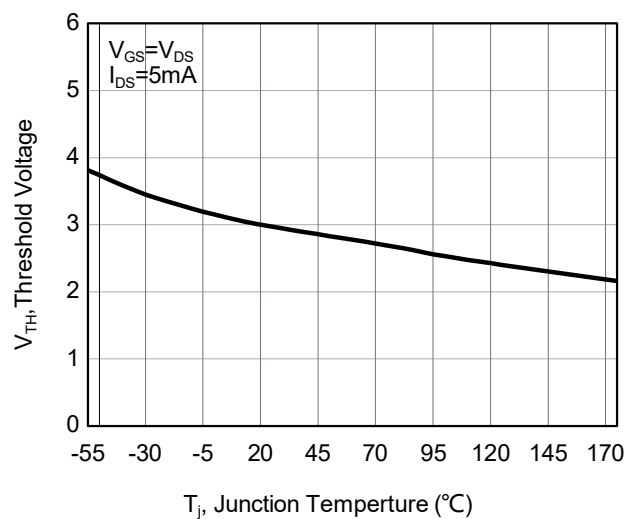


Fig 7. Gate Threshold vs Temperature

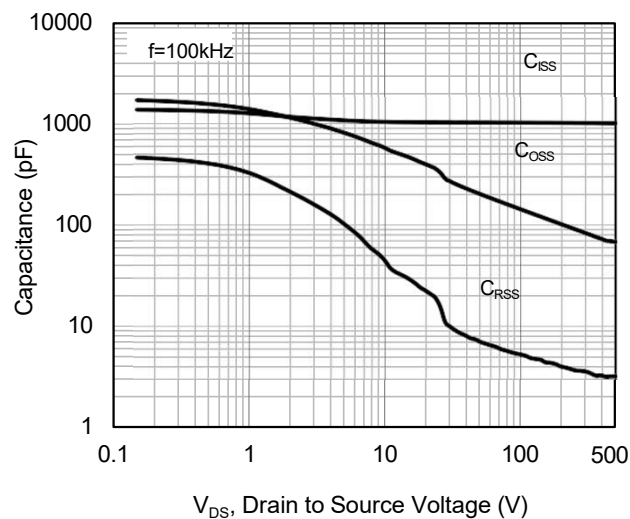
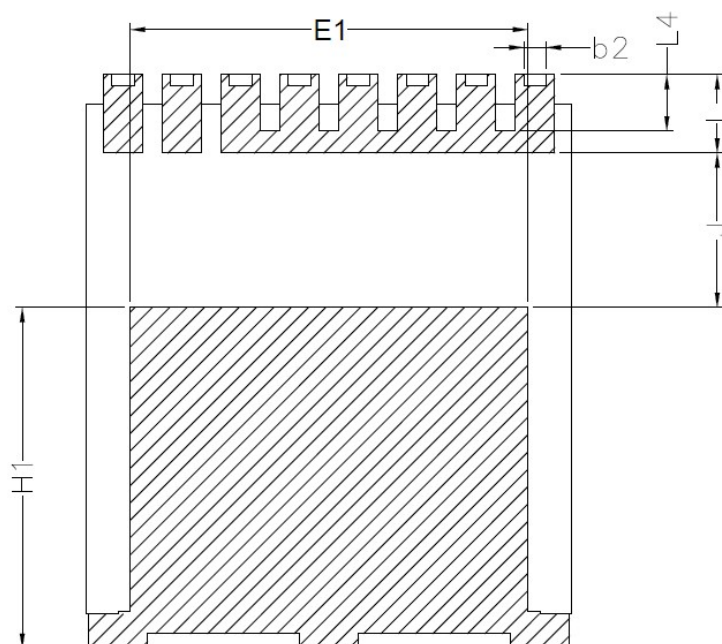
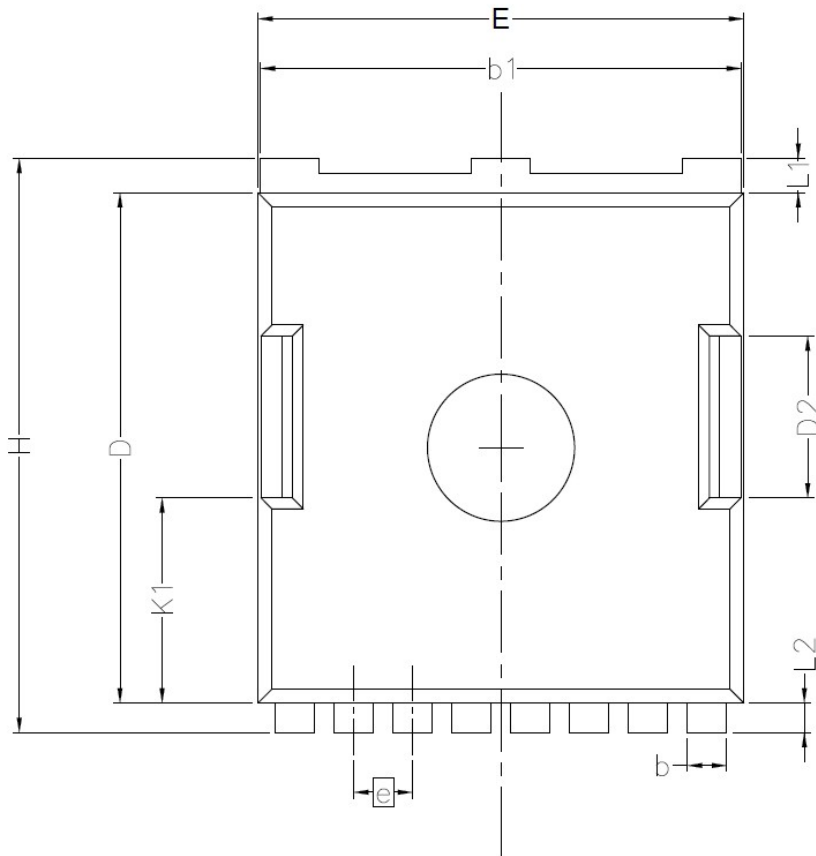
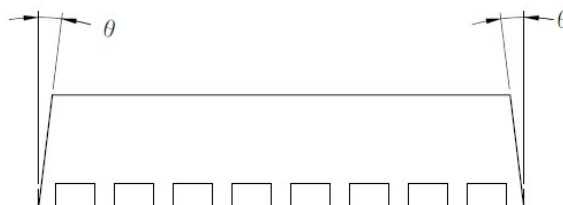
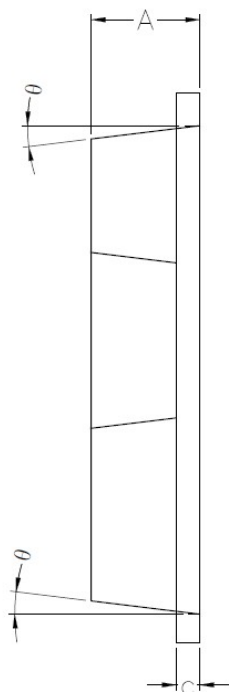


Fig 8. Capacitance Characteristics

Package Outline: TOLL



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Symbol	Min	Nom	Max
A	2.2	2.3	2.4
b	0.7	0.8	0.9
b1	9.7	9.8	9.9
b2	0.42	0.46	0.5
c	0.4	0.5	0.6
D	10.28	10.43	10.58
D2	3.1	3.3	3.5
E	9.7	9.9	10.1
E1	7.9	8.1	8.3
e		1.20 BSC	
H	11.48	11.68	11.88
H1	6.75	6.95	7.15
N		8	
J	3	3.15	3.3
K1	3.98	4.18	4.38
L	1.4	1.6	1.8
L1	0.6	0.7	0.8
L2	0.5	0.6	0.7
L4	1	1.15	1.3
θ	4°	6°	10°

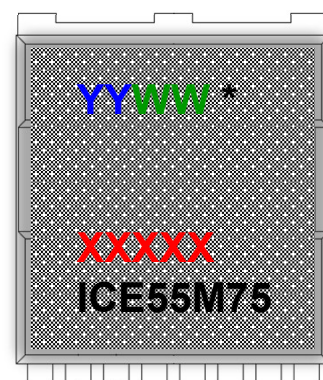
Marking Information

YY = Last two digits of the year

WW = Work week

***** = Site ID

XXXXXX = Lot ID



ICE55M75 = ICE is Icmos logo and
55M75 is a designated device part
number

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