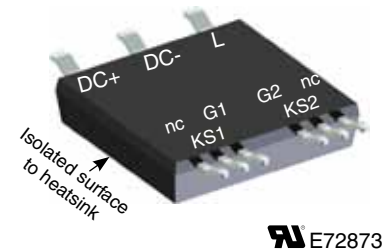
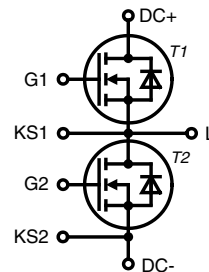


# CoolMOS™ 1) Power MOSFET

## ISOPLUS™ - electrically isolated surface to heatsink

### Surface Mount Power Device

$I_{D25} = 50 \text{ A}$   
 $V_{CES} = 600 \text{ V}$   
 $R_{DS(on) \text{ max}} = 45 \text{ m}\Omega$



#### MOSFETs T1, T2

Symbol	Conditions	Maximum Ratings	
$V_{DSS}$	$T_{VJ} = 25^\circ\text{C to } 150^\circ\text{C}$	600	V
$V_{GS}$		$\pm 20$	V
$I_{D25}$	$T_C = 25^\circ\text{C}$	50	A
$I_{D80}$	$T_C = 80^\circ\text{C}$	38	A
$E_{AS}$ $E_{AR}$	single pulse repetitive } $I_D = 11 \text{ A}; T_C = 25^\circ\text{C}$	1950	mJ
		3	mJ
$dV/dt$	MOSFET $dV/dt$ ruggedness $V_{DS} = 0 \dots 480 \text{ V}$	50	V/ns

#### Symbol Conditions Characteristic Values

( $T_{VJ} = 25^\circ\text{C}$ , unless otherwise specified)

Symbol	Conditions	min.	typ.	max.	
$R_{DS(on)}$	$I_D = 44 \text{ A}; V_{GS} = 10 \text{ V}$		40	45	m $\Omega$
$V_{GS(th)}$	$I_D = 3 \text{ mA}; V_{DS} = V_{GS}$	2.5	3	3.5	V
$I_{DSS}$	$V_{DS} = V_{DSS}; V_{GS} = 0 \text{ V}; T_{VJ} = 25^\circ\text{C}$ $T_{VJ} = 125^\circ\text{C}$		50	10	$\mu\text{A}$ $\mu\text{A}$
$I_{GSS}$	$V_{DS} = 0 \text{ V}; V_{GS} = \pm 20 \text{ V}$			100	nA
$t_{d(on)}$ $t_r$ $t_{d(off)}$ $t_f$	Resistive switching $V_{DS} = 400 \text{ V}; I_D = 44 \text{ A}$ $V_{GS} = 10 \text{ V}; R_G = 3.3 \Omega$		30 20 100 10		ns ns ns ns
$C_{iss}$ $C_{oss}$	$V_{GS} = 0 \text{ V}; V_{DS} = 100 \text{ V}; f = 1 \text{ MHz}$		6800 320		pF pF
$Q_g$ $Q_{gs}$ $Q_{gd}$	$V_{DS} = 400 \text{ V}; I_D = 44 \text{ A}$ $V_{GS} = 10 \text{ V}; R_G = 3.3 \Omega$		150 35 50	190	nC nC nC
$R_{thJC}$ $R_{thJH}$	with heatsink compound (IXYS test setup)		0.60	0.45 tbd	K/W K/W

#### Features

- **Fast CoolMOS™ 1)** power MOSFET 4<sup>th</sup> generation
  - high blocking capability
  - lowest resistance
  - avalanche rated for unclamped inductive switching (UIS)
  - low thermal resistance due to reduced chip thickness
- **Package**
  - isolated surface to heatsink
  - low coupling capacity between pins and heatsink
  - PCB space saving
  - enlarged creepage towards heatsink
  - application friendly pinout
  - low inductive current path
  - high reliability

#### Applications

- Switch mode power
- Supplies (SMPS) soft
- Switching topologie

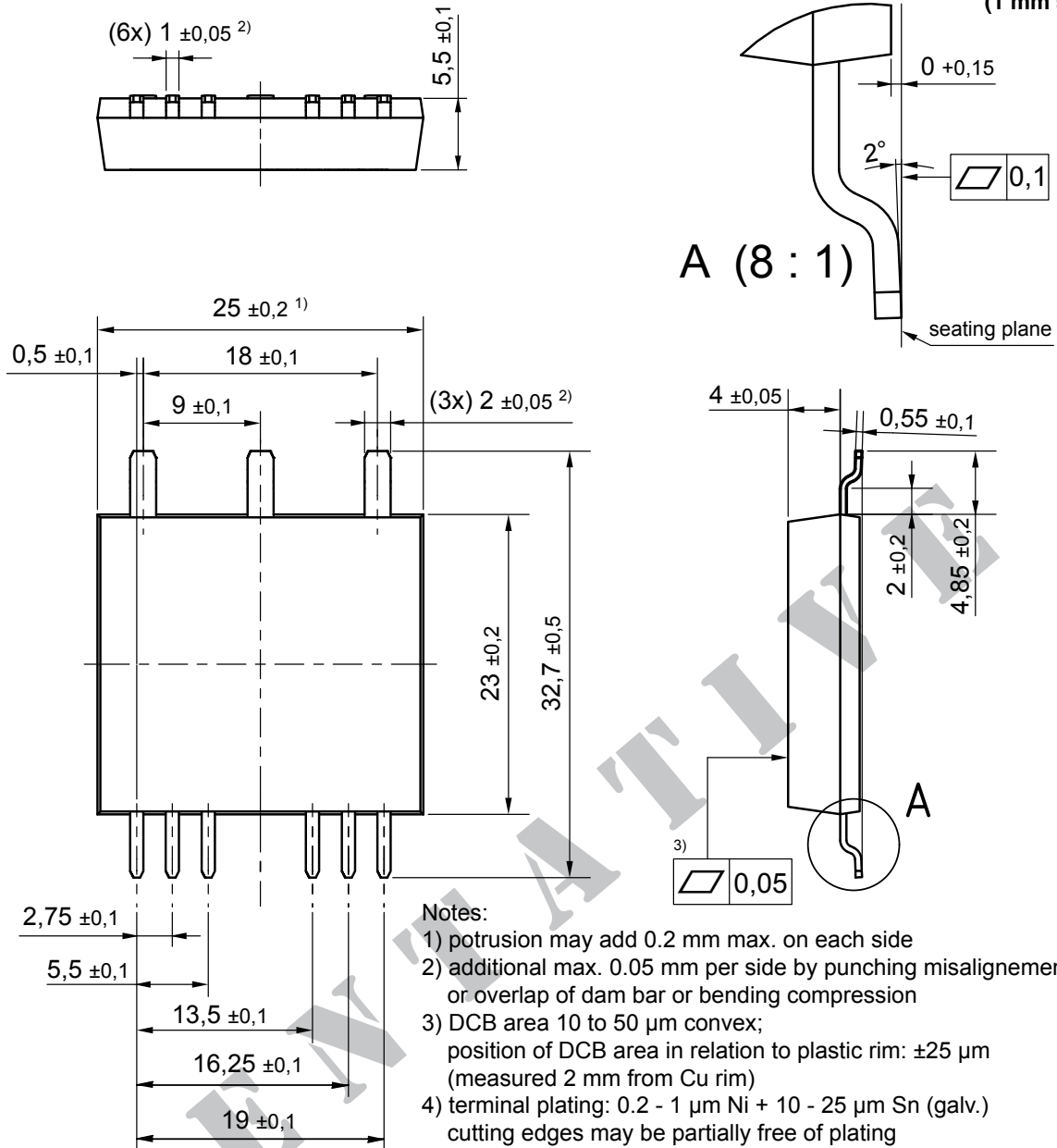
<sup>1)</sup> CoolMOS™ is a trademark of Infineon Technologies AG.

Source-Drain Diodes of T1/T2					
Symbol	Conditions	Maximum Ratings			
$I_{S25}$	$T_C = 25^\circ\text{C}$	50	A		
$I_{S80}$	$T_C = 80^\circ\text{C}$	38	A		
Symbol	Conditions	Characteristic Values			
( $T_{VJ} = 25^\circ\text{C}$ , unless otherwise specified)					
		min.	typ.	max.	
$V_{SD}$	$I_F = 44\text{ A}; V_{GS} = 0\text{ V}$		0.95	1.25	V
$t_{rr}$	$I_F = 44\text{ A}; -di_F/dt = 100\text{ A}/\mu\text{s}; V_R = 400\text{ V}$		600		ns
$Q_{RM}$			17		$\mu\text{C}$
$I_{RM}$			60		A

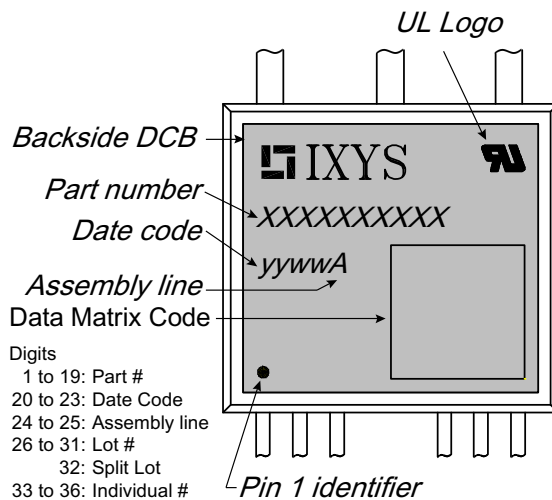
Component					
Symbol	Conditions	Maximum Ratings			
$T_{VJ}$		-55...+150	$^\circ\text{C}$		
$T_{stg}$		-55...+125	$^\circ\text{C}$		
$V_{ISOL}$	$I_{ISOL} \leq 1\text{ mA}; 50/60\text{ Hz}$	2500	V~		
$F_C$	mounting force	40 ... 130	N		
Symbol	Conditions	Characteristic Values			
		min.	typ.	max.	
$C_p$	coupling capacity between shorted pins and backside metal		90		pF
$d_S, d_A$	pin - pin	1.65			mm
$d_S, d_A$	pin - backside metal	4			mm
<b>CTI</b>		400			
<b>Weight</b>			8		g

Ordering	Part Name	Marking on Product	Delivering Mode	Base Qty	Ordering Code
Standard	MKE38P600LB-TRR	MKE38P600LB	Tape&Reel	200	510486
	MKE38P600LB	MKE38P600LB	Blister	45	480601

Dimensions in mm  
(1 mm = 0.0394")



- Notes:
- 1) potrusion may add 0.2 mm max. on each side
  - 2) additional max. 0.05 mm per side by punching misalignment or overlap of dam bar or bending compression
  - 3) DCB area 10 to 50 µm convex; position of DCB area in relation to plastic rim: ±25 µm (measured 2 mm from Cu rim)
  - 4) terminal plating: 0.2 - 1 µm Ni + 10 - 25 µm Sn (galv.) cutting edges may be partially free of plating



- Digits
- 1 to 19: Part #
  - 20 to 23: Date Code
  - 24 to 25: Assembly line
  - 26 to 31: Lot #
  - 32: Split Lot
  - 33 to 36: Individual #

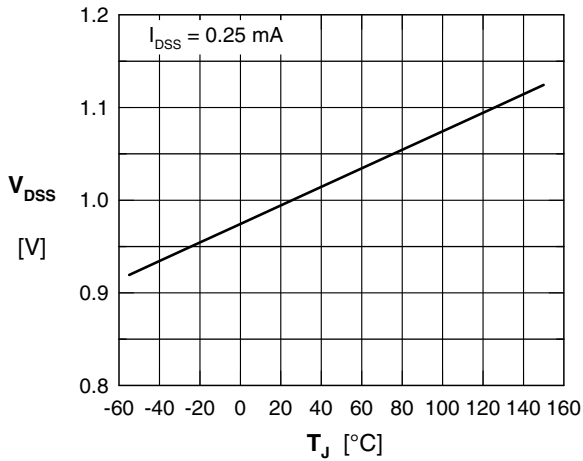


Fig. 1 Drain source breakdown voltage versus temperature  $T_{VJ}$

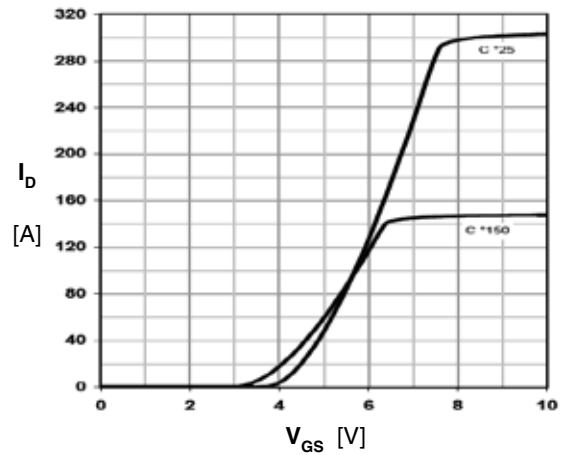


Fig. 2 Typ. transfer characteristics

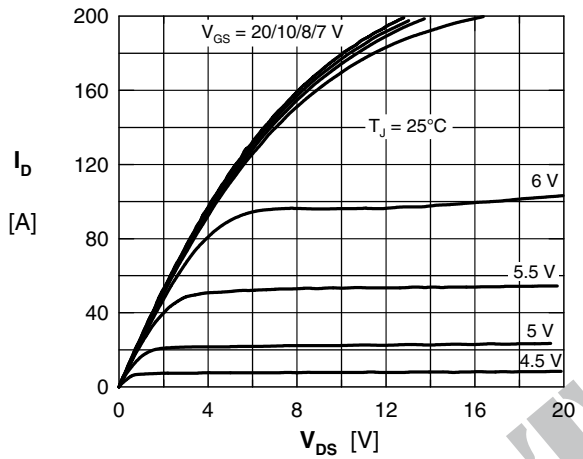


Fig. 3 Typical output characteristics

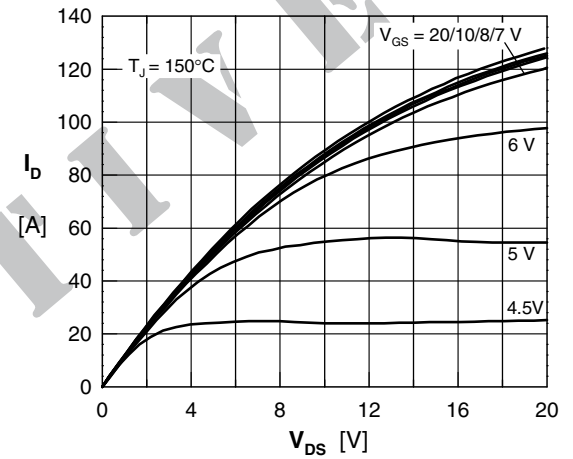


Fig. 4 Typical output characteristics

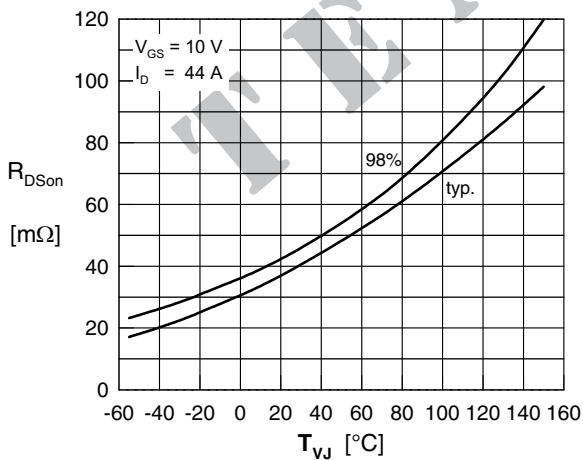


Fig. 5 Drain source on-state resistance  $R_{DS(on)}$  vs. junction temperature  $T_{VJ}$

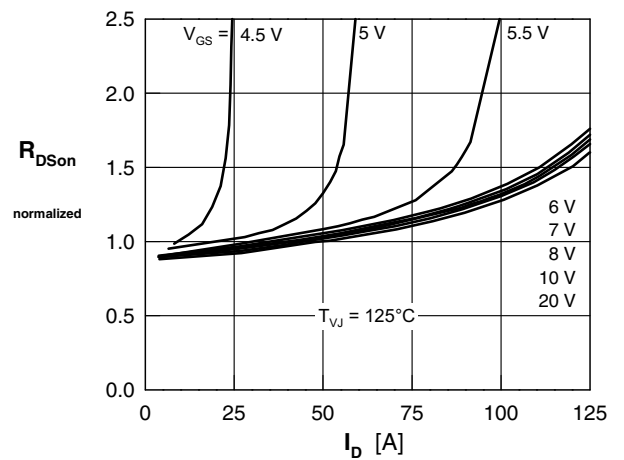


Fig. 6 Drain source on-state resistance,  $R_{DS(on)}$  versus  $I_D$

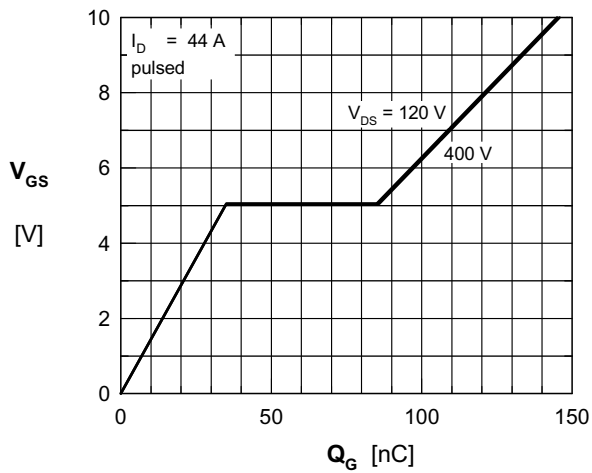


Fig. 7 Typ. turn-on gate charge

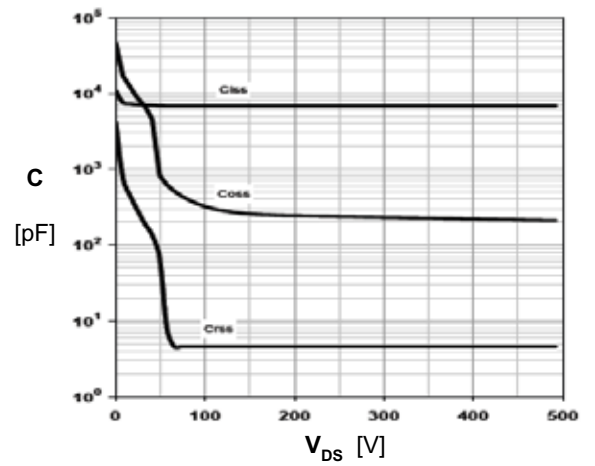


Fig. 8 Typ. capacities, MOSFET only

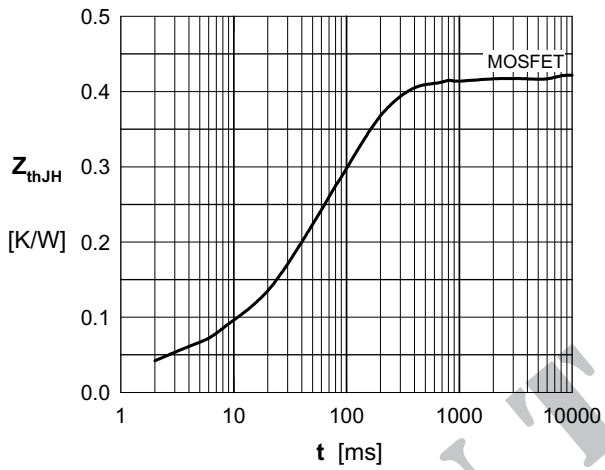


Fig. 9 Typ. transient thermal impedance

TEMPERATURE